Oral Presentation

**Oral Presentation 1**
Date & Time: September 6 (Fri.), 15:30-16:30  
Place: Room 4 (5F)

**Oral Presentation 2**
Date & Time: September 7 (Sat.), 14:00-15:00  
Place: Room 4 (5F)

**Oral Presentation 3**
Date & Time: September 6 (Fri.), 15:30-16:30  
Place: Room 5 (5F)

**Oral Presentation 4**
Date & Time: September 7 (Sat.), 14:00-15:00  
Place: Room 5 (5F)
ENDOTHelial Tkk1 DEFICIENCY PROMOTES THE PATHOGENESIS OF ATHEROSCLEROSIS

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Objectives: During pathogenesis of atherosclerosis, the communication among various related cells and tight regulation of immune cell infiltration by endothelial cells (ECs) are essential. Atherosclerosis is representative chronic inflammatory disease and Apolipoprotein E–deficient (ApoE−/−) mouse is particularly suitable disease model. Tkk1 is induced in acute inflammatory diseases for performing regulatory function and known as mainly expressed in immune cells, including myeloid cells and lymphocytes. However, little is known about the specific role of Tkk1 in atherosclerosis.

Materials and Methods: Development of atherosclerotic lesion in ApoE−/− mice and ApoE−/− mice with a genetic deletion of Tkk1 (Tkk1−/−ApoE−/−) was measured. Also, lesion development was assessed in a model of bone-marrow transplantation (BMT) using ApoE−/− mice and Tkk1−/−ApoE−/− mice as bone marrow (BM) donor or recipient mice, to identify the cell type specific deletion effect of Tkk1 in atherogenesis.

Results: We found that the expression of Tkk1 is upregulated during the progression of atherosclerosis. Also, we checked that aortic ECs, but not vascular smooth muscle cells in atherosclerotic aorta specimen, expressed murine Tkk1. Whole-body Tkk1−/−ApoE−/− mice showed accelerated plaque formation with augmented plaque stability, compared to controls. Interestingly, Tkk1−/−ApoE−/− mice, reconstituted with ApoE−/− BM, also accelerated plaque formation. However, BM specific Tkk1 deficiency resulted in reduced plaque formation, which showed reversed results with the case of Tkk1 deficiency only in aortic vascular cells. Endothelial deletion of Tkk1 caused increase in adhesive and transmigrated monocytes through monolayer of ECs. Furthermore, Tkk1−/−ApoE−/− mice exhibited robust production of plasma TNF-α, which is the most remarkable cytokine that ECs produce.

Conclusion: In conclusion, our data presents the first in vivo evidence that Tkk1 plays atheroprotective role, especially in endothelial cells and inhibits the development of atherosclerosis, likely through unknown mechanisms. These results suggest that Tkk1 has cell type specific function and target in the progression of atherosclerosis.

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MONOCYTIC GLUTAREDOXIN-1 PROTECTS AGAINST OBESITY AND ATHEROSCLEROSIS BY PREVENTING DIET-INDUCED MACРОPHAGES REPROGRAMMING AND DYSFUNCTIONS

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Objectives: Glutaredoxin-1 (Gx1) controls the S-glutathionylation status of proteins and contributes to cellular thiol redox homeostasis. The goal of this study was to determine the roles of monocytes Gx1 in the onset of diet-induced obesity and atherosclerosis.

Materials and Methods: Male and female wildtype (WT) and Gx1 deficient (Gx1−/−) mice on a C57BL/6 background were fed chow for 18 months. Body weights and fasting blood glucose levels were measured weekly, and atherosclerosis was accessed after 18 months. Myeloid Gx1 deficient mice (Gx1−/−) were generated by transplanting either WT or Gx1−/− bone marrow (BM) cells into atherosclerosis-prone female LDLR−/− mice. These chimeras were fed a high-fat diet (HFD) for 20 weeks and atherosclerosis was assessed. Monocyte priming and dysfunction was measured using the in vivo Matrigel plug assay. Macrophage reprogramming was determined by targeted RT-qPCR using custom-designed 384 TaqMan® Gene Expression Array Cards.

Results: Female but not male Gx1−/− mice became obese and hyperglycemic after 6 months of age. At 18 months of age, female Gx1−/− mice were 30% heavier than male mice. Total plasma cholesterol was only elevated by 6.3% in male and 14.7% in female Gx1−/− mice. Monocytes in 18-month old female Gx1−/− mice were primed, hyper-chemotactic and promoted the recruitment of monocyte-derived macrophages into adipose tissues, and these mice developed early atherosclerotic lesions. Gx1 deficiency promotes the reprogramming of macrophages. This reprogramming is sexually dimorphic and dramatically exacerbated in macrophages from old female mice. Female Gx1−/− mice recapitulated the obeseogenic and atherogenic phenotype of female Gx1−/− mice, showing accelerated weight gain (+14.6%), hyperglycemia and accelerated atherosclerosis (+21%) compared to WT BM recipient.

Conclusion: Our data support a causal role for diet-induced protein-S-glutathionylation in the development of obesity and atherosclerosis and identified a critical role for Gx1 in protecting monocytes and macrophages from HFD-induced reprogramming and dysfunction.

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OP1-3

HISTONE DEACETYLASE 5 INHIBITION IMPROVES HYPERTENSION THROUGH THE INHIBITION OF VASOCONSTRICTION AND ARTERIAL REMODELING

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Objectives: It has been reported that HDAC4 regulates hypertension by controlling inflammation. HDAC4 and HDAC5, belonging to class Ila HDACs, have a high homology. We hypothesize that HDAC5 may have a critical role in hypertension. We investigated the role of HDAC5 and its underlying mechanism in HDAC5 knockout (KO) mouse in response to angiotensin II.

Materials and Methods: Hypertension was induced in mice using angiotensin II infusion. Systolic blood pressure (SBP) was measured using tail-cuff method. Aortic thickness was analyzed by hematoxylin & eosin staining. Vascular contraction was determined in aortic rings and by cell contraction assay.

Results: SBP was significantly increased in wild-type mice, while it was blunted in HDAC5 KO mice. TMP269 and TMP195, which are known as selective class Ila HDAC inhibitors, decreased angiotensin II-induced SBP. Losartan, an angiotensin II receptor type-I (AT1) blocker, showed a similar effect. Angiotensin converting enzyme and AT1 expressions were downregulated in HDAC5 KO mice compared to that in wild-type mice. Aortic wall thickening in angiotensin II-induced hypertension was attenuated in HDAC5 KO mice and by class Ila HDAC inhibitors. The increase in angiotensin II-induced VSMC size was completely blocked in HDAC5 siRNA. Vascular contraction response in aortic ring test was lower in HDAC5 KO mice than that in wild-type mice. Collagen gel contraction experiment showed the same results. Vascular contraction-related genes including RhoA, Rho-associated coiled-coil containing protein kinase 1 (ROCK1), and myosin regulatory light chain 2 (MLC2) were reduced in HDAC5 KO mice. HDAC5 physically interacts with ROCK1 and MLC2, but not RhoA. Vascular reactive oxidative stress (ROS) was decreased in HDAC5 KO mice in response to angiotensin II infusion. NADPH oxidase (NOX) expression was ameliorated in HDAC5 KO mice under angiotensin II-induced hypertension.

Conclusion: These results suggest that HDAC5 may be a novel target for hypertension.

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OP1-4

ASSOCIATION OF RECURRENT PREGNANCY LOSS AND ATHEROSCLEROSIS: A RETROSPECTIVE ANALYTICAL STUDY

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Objectives: Recurrent pregnancy loss (RPL) affects almost 15% of all clinically recognized pregnancies resulting in infertility. The Psychosocial impact associated with it remains major concern throughout the globe. Primarily it remains a woman’s social burden. Of all the causes; atherosclerosis might play a modifiable risk factor role in the occurrence of RPL. Aim of the study was to explore the interrelationship between atherosclerosis and RPL.

Materials and Methods: The study was a retrospective analytical design conducted on the available OPD records of the 302 patients (reported from Oct. 2018 to May2019) of a Multispeciality Hospital in Delhi, India. 49 patients were cases of Recurrent Pregnancy Loss while the remaining were of primi or multigravidae. The socio-demographic information and clinical parameters concerning information on the number of pregnancies, miscarriages, induced abortions, and stillbirths, physical measurements (e.g. height, weight and blood pressure) along with the blood markers for assessing atherosclerotic status which included Antiphospholipid antibodies including lupus anticoagulant (LAC) and anticardiolipin (ACA) along with antithrombin levels were obtained. Odds ratio and Poisson regression analysis was done to assess probable association of deranged blood markers and positive history of miscarriage.

Results: Compared with women with no miscarriages, women with miscarriages had 1.13 (1.03–1.24), 1.16 (1.07–1.25), and 1.20 (1.05–1.38) times likelihood of atherosclerosis (assessed respectively through LAC, ACA and antithrombin level). Almost 22% of patients with high LAC level; gave previous history of RPL >3. Further a positive correlation was observed between mean age of the patients >34.55 and high ACA level.

Conclusion: The study gives an insight towards the probable relation between atherosclerosis and recurrent pregnancy loss. Pregnancy losses and atherosclerotic disease may be etiologically linked through underlying pathology which needs to be assessed further through longitudinal cohort studies to plan health Promotive activities at mass level advocating the common risk factor approach.

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MATHEMATICAL MODELING OF OBESITY DISEASE RELATED TO THE CHRONIC INFLAMMATION

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\textbf{Objectives:} In this case that examined obesity is a disease associated with chronic inflammation. The disease is caused by the excessive accumulation of fat in the body. As a result, the adipose tissue will experience chronic inflammation characterized by enlargement of adipocyte cell size (hypertrophy). The adipocyte cells secrete inflammatory mediators such as chronic is TNF-α, MCP-1, F\textsubscript{44}, F\textsubscript{45}, Th1, IFN-γ, T\textsubscript{reg} and IL-10. In this research will be examined the behavior and the construction of a mathematical model for obesity related with chronic inflammation. In addition, computer simulations of the model as a form of modeling approaches to the parameters that have been given to check the results of the analysis that has been done.

\textbf{Materials and Methods:} In this section, a dimensional mathematical model is developed for the interaction between the following species in an Obesity in a one dimensional (1D) domain. A continuum approach is adopted and ODEs are used to model the temporal and spatial evolution of the dependent variables. The analysis with mathematics and computer approaches is very dominant. Broadly speaking, the stages start from forming the governing equation, geometry projection, determining boundary and initial conditions, analysis of a reduced model: parameter estimation, numerical or computer simulation and determining treatment regimes.

\textbf{Results:} The behavior of any chronic inflammatory mediators in the disease of obesity is influenced by the magnification of adipocyte cell size and intensity of anyinflammatory mediators. In addition, the behavior of any inflammatory mediators overtime to the point of stability.

\textbf{Conclusion:} Our findings are consistent with results of clinical trials.

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THE EFFECT OF STATINS ON PRIMARY PREVENTION OF CARDIO-CEREBROVASCULAR EVENTS, CANCER, AND MORTALITY IN THE ELDERLY: A POPULATION-BASED COHORT STUDY

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\textbf{Objectives:} To analyze the risk of cardio-cerebrovascular events, cancer, and mortality in elderly Korean subjects according to statin use and diabetes status.

\textbf{Materials and Methods:} A Korean population-based cohort study with data analyzed between January 1, 2009, and January 1, 2013. Subjects with and without diabetes in a prospective population-based cohort were analyzed over time. This study included 86227 subjects (diabetes: 22290; no-diabetes: 63937), ≥ 67 years of age, without previous diagnosis of cancer and cardio-cerebrovascular events. They were classified as statin users (n=18659) and statin non-users (n=67568). Cardio-cerebrovascular disease, cancer, and mortality were analyzed for 4 years of follow-up in subjects with and without diabetes according to statin treatment. Age, sex, body mass index, smoking, drinking, Charlson comorbidity Index, and diabetes complication severity index were measured at baseline. Hazard ratios (HRs) were computed for all outcomes and adjusted for the covariates.

\textbf{Results:} The risk of cardio-cerebrovascular events was higher in statin users. The risk of cancer (without diabetes: HR = 1.09, 95% CI = 1.00 -1.19, p-value = 0.048; diabetes: HR = 1.18, 95% CI = 1.05 -1.33, p-value = 0.004) and mortality (without diabetes: HR = 2.65; 95% CI = 2.32 - 3.03, p-value < 0.001; diabetes: HR = 2.11; 95% CI = 1.84 - 2.43; p-value < 0.001) were instead decreased. Statins were significantly associated with diabetes (incidence per 1000 person-years = 0.29; 95% confidence interval = 0.288 - 0.306 in statin users vs. 0.18; 95% CI = 0.173 - 0.180 in statin non-users; p-value < 0.001).

\textbf{Conclusion:} Cardio-cerebrovascular events occurred more often in statin users; however, the incidence of mortality and cancer was significantly lower in statin users. There was not significant difference in the incidence of diabetes in statin and non-statin-users. Therefore, statins can be considered “essential” in the elderly population.

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OP2-1

DISRUPTED AUTOPHAGY FLUX IN ADIPONECTIN KNOCKOUT MICE EXACERBATES ISCHEMIA-INDUCED CARDIOMYOCYTE CELL DEATH

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Objectives: Multiple studies have established adiponectin’s cardio-protective effects and their associations with heart failure (HF). Here we analyzed the detailed mechanism underlying adiponectin’s beneficial effects are still unknown, with a particular focus on autophagy.

Materials and Methods: We studied the molecular mechanisms underlying adiponectin’s cardio-protective effects in adiponectin knockout (Ad-KO) compared with wt mice subjected to ischemia by coronary artery ligation and H9c2 cardiomyocyte cell line exposed to hypoxia.

Results: After 7 days of ischemia, Western blot analysis of autophagy markers (Beclin1, ATG5-12, LC3B, p62) and fluorescence molecular tomography (FMT) for lysosomal cathepsin activity indicated that autophagosome clearance was significantly disrupted in Ad-KO mice. Changes in autophagy correlated with enhanced ischemia-induced cell death in hearts of Ad-KO mice after ischemia. Echocardiography revealed exaggerated cardiac dysfunction in Ad-KO mice after ischemia. Hypoxia stress caused diminished autophagosome clearance and activation of apoptosis via cytochrome C release from mitochondria. Adiponectin treatment significantly restored autophagy flux and reversed cell death induced by hypoxia. However, such changes were not observed in the presence of compound C or in autophagy deficient (ATG5X130R-H9c2) cells.

Conclusion: Our data suggest that adiponectin is an important mediator of cardiac autophagy, and that lack of autophagy in hearts of Ad-KO mice after ischemia contributes to enhanced cell death and cardiac dysfunction.

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OP2-2

ASSOCIATION OF NON-ALCOHOLIC STEATOHEPATITIS WITH THE PROGRESSION OF CAROTID ATHEROSCLEROSIS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Objectives: There is increasing concern about cardiovascular risk of non-alcoholic fatty liver disease. We aimed to evaluate whether hepatic steatosis with or without fibrosis is associated with the progression of carotid atherosclerosis in patients with type 2 diabetes mellitus (T2DM).

Materials and Methods: We enrolled 1,120 T2DM patients who underwent repeated carotid artery ultrasonography at 6-8 year intervals and evaluations for the presence of hepatic steatosis or fibrosis at baseline. The association between liver status and progression of carotid atherosclerosis was investigated.

Results: Of 1,120 patients, 636 patients were classified as hepatic steatosis group. Hepatic steatosis was significantly associated with 6-8 year progression of carotid atherosclerosis (adjusted OR: 1.360, 95% CI: 1.004-1.844; p < 0.05). Among patients with hepatic steatosis, only individuals with hepatic fibrosis showed significant association with carotid atherosclerosis progression (adjusted OR: 1.636, 95% CI: 1.024-2.612; p < 0.05). Furthermore, subjects who had hepatic steatosis combined with fibrosis and 4 or more components of metabolic syndrome criteria showed markedly increased risk of atherosclerosis progression (OR: 2.776, 95% CI: 1.276-6.039; p < 0.05).

Conclusion: Hepatic steatosis with fibrosis is independently associated with the progression of carotid atherosclerosis in patients with T2DM.

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**OP2-3**

**SARCOMERIC GENE POLYMORPHISMS AND THEIR ROLE ON LEFT VENTRICULAR DYSFUNCTION IN CORONARY ARTERY DISEASE PATIENTS**

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**Objectives**: To determine the role of MYBPC3 25bp, TNNT2 5bp and TNN 18bp ins/del polymorphisms on LVD in CAD patients

**Materials and Methods**: The study included 200 healthy controls and 988 consecutive patients with angiographically confirmed CAD. Among them, 253 with reduced ejection fraction (LVEF <45%) were categorized as having LVD. MYBPC3 25bp, TNNT2 5bp and TNN 18bp ins/del polymorphisms were determined by polymerase chain reaction and TaqMan allelic discrimination assay.

**Results**: Our results showed that MYBPC3 25bp deletion was significantly associated with CAD as well as LVD (healthy controls v/s CAD; p value = 0.003; OR=4.08, healthy controls v/s LVD; p value < 0.0001; OR=6.67 and Non-LVD v/s LVD; p value = 0.031; OR=1.67). The TNNT2 5bp and TNN 18bp polymorphisms were not found to be associated with CAD (p-value=0.580, OR=0.88; p-value=0.795, OR=0.91; respectively) or LVD (p-value=0.146, OR=1.35; p-value=0.935, OR=0.97 respectively) when compared to controls.

**Conclusion**: The frequency of MYBPC3 DW genotype and D allele was associated with LVD implying that genetic variants of MYBPC3 encoding mutant structural sarcomeric protein could increase susceptibility to left ventricular dysfunction. Therefore, 25bp deletion in MYBPC3 may represent a genetic marker for cardiac failure in CAD patients.

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**OP2-4**

**INFLUENCE OF SLC22A1 GENE (RS628031) POLYMORPHISM ON METFORMIN EFFICACY AND LIPID PROFILE CHANGES IN INDIAN T2DM PATIENTS**

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**Objectives**: To study effect of drug transporter SLC22A1 gene polymorphism M408V G>A (chr6: 160139813, rs628031) on Metformin efficacy and lipid profile in Indian T2DM patients.

**Materials and Methods**: Newly diagnosed T2DM patients (n=250) were enrolled from outpatient Medicine Department, King George's Medical University, Lucknow, India after institutional ethics approval and informed written consent. Inclusion criteria for T2DM patients: HbA1C>6.5%, Fasting Plasma Glucose (FPG)126mg/dl and Post-Prandial Glucose (Ppg)200mg/dl. Patients were prescribed Metformin monotherapy (500 + 500 mg/day) and followed up after 12 weeks. Response to Metformin was evaluated in 234 patients by measurements of FPG, PPG, HbA1c, Total Cholesterol (TC), Triglyceride (TG), High-density lipoprotein (HDL), Low-density lipoprotein LDL and Very low-density lipoprotein (VLDL) before treatment (BT) and after treatment (AT). Genotypes of all subjects were identified by polymerase chain reaction- restriction fragment length polymorphism (PCR-RFLP).

**Results**: Out of 234 T2DM patients, 177 were classified as responders to Metformin while 57 were non-responders. Pooled results demonstrated that Metformin had a statistically significant effect on FPG and PPG with P<0.001 and HbA1c (P= 0.0338) in responders vs non-responders. No significant effect was found in TC (P=0.249 BT, P=0.372 AT), TG (P=0.329 BT, P=0.173 AT), HDL (P=0.75 BT, P=0.333 AT), LDL (P=0.055 BT, P=0.052 AT) and VLDL (P=0.272 BT, P=0.260 AT) between both groups before (BT) and after treatment (AT) respectively. Carriers of the minor allele ‘A’ (GA) were found to be non-responders while GG individuals were better responders showing a significant difference when compared to non-responders (P=0.04).

**Conclusion**: Metformin effectively lowers FPG, PPG and HbA1c levels in responders. A decrease in TC and TG levels was observed in responders although not significant. Data showed that gene polymorphism in SLC22A1 gene significantly influence the therapeutic efficacy of Metformin. Study with larger number of patients may represent association of SLC22A1 gene (rs628031) with lipid profile changes.

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**OP2-5**

**CARDIOVASCULAR RISK FACTORS TO PREDICT MAJOR ADVERSE CARDIOVASCULAR EVENTS (MACE) IN DIABETIC AND NON-DIABETIC POPULATION**

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**Objectives**: To determine the prevalence of MACE (coronary artery disease [CAD] and stroke) and compare the associated risk factors (RF) among diabetic (Type-2 diabetes mellitus [T2DM]) and non-diabetic population of Central-Jakarta City, Indonesia.

**Materials and Methods**: We conducted a population-based study examining 82,626 residents aged above 18 years old (y.o) who visited primary health care and community-based integrated health center (IHC) in 2017-2018. We collected data including blood pressure, body mass index (BMI), personal (PH) and family history (FH) of RF including smoking, T2DM, stroke, CAD, and dyslipidemia using standardized protocol.

**Results**: Prevalence of MACE was 1.4%, comprising 1% of subjects had only CAD, 0.3% had an only stroke, and 0.1% had both. Premature MACE in subjects below 40 y.o accounted for 0.54%. Diabetic-group had higher prevalence of CAD (5.5% vs 0.7%), stroke (1% vs 0.3%), and both of disease (1.2% vs 0.1%) compared to non-diabetic group. Multivariate analysis showed that odds for MACE increased along with increasing age (OR=1.04, p<0.0001, p-trend=0.0001), presence of FH of CAD (OR=4.7, p<0.0001) and stroke (OR=1.5, p=0.001), PH of hypertension (OR=4, p<0.0001), and increasing BMI (OR=1.3, p=0.0001, p-trend<0.01). Stratified analysis showed that the odds were only statistically significant in diabetic-group with BMI >25 kg/m2 (OR=1.6, p<0.05, p-trend<0.0001). Conversely, only in the non-diabetic group, FH of stroke (OR=1.7, p<0.0001) and PH of dyslipidemia (OR=1.6, p<0.0001) were significantly associated with MACE. The non-diabetic group with FH of CAD had higher odds of MACE compared with diabetic-group (OR=6 vs 2.4, p<0.0001).

**Conclusion**: Increasing age and BMI, FH of CAD, stroke, and T2DM, PH of hypertension and dyslipidemia were independent RF for MACE among the population of Central-Jakarta City. T2DM patients need stricter control of BMI to reduce the risk of MACE. The initiative of community-based IHC had a pivotal role in CVD management, therefore community intervention should be optimized.

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**OP2-6**

**PROTECTIVE EFFECT OF INFLUENZA VACCINATION ON OUTCOMES IN GERIATRIC STROKEPATIENTS: A NATIONWIDE MATCHED COHORT STUDY**

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**Objectives**: The effects of influenza vaccination (IV) on stroke outcomes are unclear. The purpose of this study is to evaluate the outcomes after stroke in elderly individuals who have received an IV.

**Materials and Methods**: We used Taiwan’s National Health Insurance Research Database 2000–2009 claims data to conduct a nested stroke cohort study including 148,909 hospitalized stroke patients aged 66 years and older. Using a matching procedure by propensity score, we selected 25,248 stroke patients with IV and 25,248 stroke patients without IV for comparison. Logistic regression was used to calculate adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of poststroke complications and in-hospital mortality associated with IV.

**Results**: Stroke patients with IV had significantly lower risks of post-stroke pneumonia (OR=0.79; 95% CI, 0.74–0.83), septicemia (OR=0.78; 95% CI, 0.70–0.86), urinary tract infection (OR=0.87; 95% CI, 0.83–0.92), and 30-day in-hospital mortality (OR=0.60; 95% CI, 0.54–0.67) compared with non-IV stroke patients. Vaccinated stroke patients also had shorter hospital stays (p < 0.0001) and less medical expenditures (p < 0.0001) during stroke admission than the control group. Lower rates of post-stroke adverse events in patients with IV were noted in both sexes of all age groups with various types of stroke.

**Conclusion**: Stroke patients with IV showed fewer complications and lower mortality compared with non-IV patients. These findings suggest the urgent need to promote IV for this susceptible population of stroke patients.

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OP3-1

STUDY OF THE EFFECT OF EARLY EVENING MEAL INTAKE AND LATE NIGHT MEAL INTAKE ON ANTHROPOMETRIC AND BIOCHEMICAL PARAMETERS IN TYPE 2 DIABETICS

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Objectives: 1) To study the effect of time restricted meal intake on anthropometric and biochemical parameters in Type 2 diabetics. 2) To study whether time restricted feeding has any effect on the number and doses of drugs in Type 2 diabetics.

Materials and Methods: 100 diabetics were enrolled from OPD, Endocrinology, KGMU. They were randomly divided based on whether they have consented (TRM time restricted meal group) or not (control group). Baseline parameters were recorded and follow up was done at 6 months and 12 months for anthropometric measurement, height, weight, waist hip ratio, aBSI, neck size, blood sugar (Fasting and post prandial), HbA1C and lipid profile, Serum Cholesterol, Serum triglycerides, HDL-Cholesterol, LDL-Cholesterol, VLDL Cholesterol. Patients were given clear understanding about chrono medicine and how it affects their health. A single intervention was done in the TRM group that the timing of dinner was at or around 7 in the evening for the TRM group.

Results: 65% of TRM group had normal control of blood sugar level (Hba1c values) and only 40 percent of those in the non-TRM group (control group) had normal sugar level after 12 months. BMI (p<0.0030), Hip size (p<0.0012), systolic blood pressure (p<0.0211), HbA1c (p<0.0017), blood sugar (fasting p<0.0167), and post-prandial (p<0.0001) changed significantly. Total cholesterol decreased by 18 mg/dl (p value 0.3), Triglycerides decreased by 32 mg/dl (p value 0.01), LDL decreased by 21 mg/dl (p value 0.03), VLDL decreased by 5.5 mg/dl (p value 0.04), HDL increased by 8 mg/dl (p value 0.20). p value was significant in all parameters of lipid profile.

Conclusion: Highly significant results were obtained in the case of fasting and post prandial values of blood sugar in TRM group, when compared to the control group. The effects of time restricted meal intake in diabetics show promise and are worth exploring further.

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OP3-2

TECHNOLOGY COMBINATION OF CENTRIFUGE AND HEATER TO REDUCE GLYCEMIC INDEX IN RICE FOR DIABETES MELLITUS PATIENT

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Objectives: Carbohydrate source such as white rice was known containing high glycemic index about 74% of the total composition and caused in increasing the blood glucose level in diabetes mellitus patients. Therefore, we made an innovation by combining the centrifuge and heater technology to lowering the glycemic index in white rice.

Materials and Methods: This study starts from March until July 2018 in the laboratory of mechanical engineering faculty, chemistry laboratory, and Polanharjo village. The method used in this process is Kaizen, Usability method, LuffScholer method, and quasi-experiments. Basically, this technology was made from two kinds of instruments there are centrifuge and heater.

Results: The result was 5 minutes to reached the appropriate rice, while the centrifuge speeds were 200 rpm which can process as much as 3 kg rice in 45 minutes of cooking time. To verified the result, we identified the glycemic index used Luff-Scholer method. It was proved that the white rice glycemic index had been decreased as much as 27% compared with conventional rice. Furthermore, in clinical trials shown that 83% of T2D patients had ≤200 mg/dl in two-hour postprandial for the post-test, besides the pre-test showed ≥200 mg/dl in each subject. According to the statistical analysis it was showed that there were significant differentiation between consumed the artificial white rice and conventional white rice (P≤0.05; n = 20).

Conclusion: Based on the result, combining the two technology of centrifuge and heater could decreased the glycemic index in rice and had positive effect in blood glucose patients with T2D. This is an useful technology for diabetes mellitus patients to maintenances the glucose intake.

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OP3-3

CARDIOVASCULAR METABOLIC SYNDROME: ASSESSMENT OF RISK FACTORS AMONG ADOLESCENTS IN INDIA

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Objectives: The Cardiovascular metabolic syndrome (CMS) is a major and escalating public-health Further, patients with the MetS are at 2- to 4-fold increased risk of stroke, a 3- to 4-fold increased risk of myocardial infarction (MI). The study was planned to assess the risk factors present in adolescents for the CMS

Materials and Methods: The study was undertaken in five districts of Nainital between July and December 2011. A total sample size of 1000 children per district was calculated. In each district, 6 schools (4 rural, 2 urban; 5 Government, 1 Private) were covered. Data were collected in the standardized tool adopted from WHO tool for adult RF surveillance.

Results: A total of 4339 students were covered during the study. 86.1% of students were in 13 to 15 year age group. 2587 boys (59.6%) and 1752 girls (40.4%) were covered in the study. Obesity: It was observed that 1.4% of boys and 2.4% of girls had BMI of 25 or more, and were categorized as overweight or obese. Blood Pressure: Blood pressure was measured in 3 districts namely Wardha, Nainital and Thrissur. It was observed that 32 out of 1359 boys (2.4%) and 22 out of 1102 girls (2%) had systolic blood pressure above 130 mmHg at the time of examination. Blood Sugar: It was observed that nearly 10% boys and 13% girls had RBS levels higher than 125 mg/dl, and 4% boys and 5.2% girls had RBS levels of 140 or higher indicating potential risk of diabetes. Physical Activity nearly 14% of students did not have any physical activity. Tobacco & Alcohol It was noticed that 8.5% of students did report having smoked tobacco.

Conclusion: Seeds of CMS are sown during childhood and early adolescent span of life. Effective preventive measures should focus on imparting knowledge and developing health attitude and practices in schools.

OP3-4

EFFICACY AND SAFETY OF LONG-TERM EVOLOCUMAB USE IN ASIAN VERSUS OTHER SUBJECTS: THE FOURIER TRIAL

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Objectives: There are concerns that Asian people respond differently to some medications. We evaluated the efficacy and safety of evolocumab use in the FOURIER trial among participants of Asian versus other backgrounds.

Materials and Methods: The effects of adding evolocumab (either 140 mg subcutaneously every 2 weeks or 420 mg subcutaneously monthly) versus matching placebo to background optimized statin therapy over a median 2.2 years follow-up, on LDL-C reductions, cardiovascular events and adverse safety events were compared among all 27,564 FOURIER participants with prior MI, stroke or PAD, according to Asian (n=2,723) versus other (n=24,841) declared race.

Results: High-intensity statin use, compared with moderate dosing, was less frequent in Asian subjects compared with others (33% vs. 73%). Stroke was the qualifying atherothrombotic event in Asians more than in others (29% vs. 18%). Baseline LDL-C levels were similar among Asians and others (89 vs. 92 mg/dl) and evolocumab lowered LDL-C (baseline to 48 weeks) similarly in Asians and others from median 89 to 22 mg/dl, and from 92 to 30 mg/dl respectively. Compared with placebo, reductions with evolocumab in normalized primary endpoint (PEP-CV death, MI, stroke, hospitalization for unstable angina, coronary revascularization) events and in key secondary endpoint (SEP-CV death, MI, stroke) events were comparable; 5.2% vs. 4.2%; Relative Risk Reduction (RRR)(95%CI) 0.79 (0.61, 1.03), and 3.6% vs. 2.7%; RRR(95%CI) 0.73 (0.53, 1.01) respectively in Asian patients and 5.4% vs. 4.6%, RRR(95%CI) 0.86 (0.79, 0.93), and 3.4% vs. 2.8%, RRR(95%CI) 0.81 (0.73, 0.89), in others (both p for treatment interactions=ns). Serious adverse event rates were no higher among participants of Asian versus other races (11.8% versus 12.5% respectively per annum), and active study drug discontinuations due to adverse events were low in both Asian and other subjects (1.5% vs. 2.1% per annum).

Conclusion: Use of evolocumab among Asian subjects was safe, lowered LDL-C comparably, and reduced CVD events at least as effectively as in patients of non-Asian background in FOURIER. No need was identified to modify the evolocumab dose for individuals of Asian race.

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INFLUENCE OF ALCOHOL AND RED MEAT CONSUMPTION ON LIFE EXPECTANCY: RESULTS OF 164 COUNTRIES FROM 1992 TO 2013

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Objectives: Global meat production has increased rapidly over the past 50 years, while Asia is accounting for around about half of global meat production, of which about 2/3rd is red meat. High consumption of red meat which is carcinogenic to humans and drinking alcohol are major causes of premature death and shorten life expectancy. The aim of this study was to examine the association between alcohol and red meat consumption on life expectancy (LE) by analyzing data from 164 countries using an ecological approach.

Materials and Methods: This was a longitudinal ecological study and the data that was used from the Food and Agriculture Organization (FAO) included 164 countries over the period 1992-2013. In the regression analysis, the relationship between alcohol and red meat consumption with LE was estimated using a pooled ordinary least squares regression model, measure of alcohol and red meat consumption by five each 5 years.

Results: The consumption of alcohol and red meat between high income countries (HIC) was about four times (36.8-143.0 kcal/capita/day) and five times (11.2-51.9 kcal/capita/day) higher in comparison with low income countries (LIC). In our model using a measure of red meat consumption with a five-year lag, did not have statistically significant relationship with LE in LIC (β = -1.539, p = 0.173) or LMIC (β = -0.418, p = 0.520), but it was negatively associated LE in UMIC (β = -1.574, p = 0.001) and HIC (β = -0.838, p = 0.003). An alcohol consumption was negatively associated with LE for all income groups, while beneficial relationships were found in all estimates associated with GNI and fruit consumption.

Conclusion: High consumption of red meat and alcohol consumption appear to have a negative impact on LE. So, HIC and UMIC should control consumption of meat and alcohol adopting specific policy.

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THE TRIGLYCERIDE GLUCOSE INDEX (TYG INDEX), SURROGATE MARKER OF INSULIN RESISTANCE AND DEMENTIA: POPULATION-BASED STUDY

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Objectives: Recent several studies in both humans and animal models suggest that insulin resistance has negative effects on cognition, there were few evidences from large population study. In the current study, we evaluated the potential relationships between the triglyceride glucose index (TyG index), surrogate marker of insulin resistance, and dementia using a large-scale population dataset from the National Health Information Database (NHID).

Materials and Methods: We did a retrospective, observational, cohort study of 13,149,723 persons aged older than 40 years from 2009 to 2015 using NHID. We used the TyG index as a measures of insulin resistance and divided the subjects into quartiles groups based on TyG index. The incidence of dementia was assessed using the hazard ratios (HRs) estimated with cox proportional hazard modeling.

Results: During a median follow-up period of 5.26 years, dementia was diagnosed in 252,114 (1.92%) participants. Among them, Alzheimer disease (AD) were diagnosed 73% and vascular dementia (VD) were diagnosed 27%. Multivariate-adjusted hazard ratios (HRs) for patients in highest quartile of TyG index were higher for dementia (HRs=1.147; 95% confidence intervals [CI] 1.132-1.161), for AD (HRs =1.120; 95% CI 1.103-1.136), and for VD (HRs =1.220; 95% CI 1.177-1.264) compared with subjects in the lowest quartile of TyG index. These effects were independent of age, sex, smoking, physical activity, body mass index, systolic blood pressure, and total cholesterol.

Conclusion: In our large population study, TyG index, surrogate marker of insulin resistance was associated with an increased risk of dementia, even including AD, and it was independent of traditional cardiovascular risk factors.

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OP4-1

ASSOCIATION OF PROMOTER VARIANTS OF VISFATIN 1001 T/G & 423 A/G GENE AND THEIR CIRCULATING LEVEL WITH CORONARY ARTERY DISEASE OF NORTH INDIAN POPULATION

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Objectives: Visfatin is a recently discovered adipokine, which is highly expressed in visceral fat. It seems to modulate insulin sensitivity and appear to play an important role in the pathogenesis of insulin resistance, diabetes, dyslipidemia, inflammation, and atherosclerosis. The polymorphism at promoter of Visfatin has been shown to increase transcriptional activity of the gene and play an important role in pathophysiology of coronary artery disease (CAD). Present study aimed to investigate the visfatin gene polymorphism on various risk factors of CAD and its relation with circulating visfatin.

Materials and Methods: Visfatin gene polymorphism (1001 T/G & 423 A/G) have been studied in 300 diagnosed CAD subjects with age 51.52± 9.30; & BMI 25.30±3.59 and 300 healthy controls with age 51.62± 9.51; & BMI 24.04 ± 7.31. These Visfatin polymorphism were detected by real time PCR by using Taqman SNP genotyping assay. Furthermore serum Visfatin level was also measured.

Results: The results of the present study revealed that a significant association with susceptibility to CAD was detected with polymorphisms in Visfatin gene, variant genotype TG+GG (dominant model) (p=0.038: OR=1.45: 95% CI=(1.03-2.03)) and variant allele (G) (p=0.017: OR=1.43: 95% CI=(1.07-1.92)) of Visfatin-1001 T/G gene and variant genotype of AG+GG dominant model (p=0.005: OR=1.82: 95% CI=1.20-2.68) and variant allele (G) (p=0.003: OR=1.41: 95% CI=(1.12-1.77)) of Visfatin-423 A/G gene were significant highly observed in the cases as compared to control group. Allelic and genotypic frequencies did not deviate from Hardy-Weinberg equilibrium in the controls (p > 0.05). Furthermore, variant genotype and allele were found associated with risk factors of CAD.

Conclusion: The findings of present study suggest that the -1001T & -423 of Visfatin gene polymorphism may affect their circulating level and other risk factors which ultimately play an important role in the development of CAD of North Indian population.

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OP4-2

EFFECT OF MILLETS FLOURS, BROWN RICE, CONSUMPTION ON BLOOD SUGER LEVELS, LIPID PROFILE AND ANTHROPOMETRIC INDICES AMONG SELECTED KNOWN TO KNOW EMPLOYEES IN NEPAL

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Objectives: The study evaluated the effect of Millets flours,brown rice corn flours consumption on the biochemical parameters, used to diagnose diabetes mellitus, Lipid profile, and anthropometric Measures among selected politician and known to know employee in Nepal.

Materials and Methods: The study was a 6 month dietary intervention trial with participant from the different agencies of the Department of science and technology and Bhaktapur city ASUNTA Medicare Pvt ltd. After randomization, the intervention group (N=28) received and consumed millets flours, brown rice, corn flours daily for 6 months while the control group (N=29) received and consumed the same variety of white rice daily. A mixed analysis of covariance was politician and employee to compare the observed changes between groups in terms of biochemical parameters,lipid profile,and anthropometric measures from baseline to completion of the intervention change was adjusted for sex, age and respective baseline variables. AP value less then 0.05 was considered statistically significant.

Results: Both groups exhibited similar changes in fasting blood sugar and glycosylated hemoglobin throughout the intervention. A small, positive change in fasting blood sugar was first observed from baseline to midline, followed by a significant improvement (ie reduction) toward endline. The oppositewas observed for glycosylated hemoglobin, wherein a greater reduction from baseline to midline was initially observed. On the other hand, the minimal change in postprandial blood sugar among those who consumed millets and corn flours was uniform throughout the intervention while an increase in postprandial blood sugar was first observed among those who consumed white rice, followed by a decrease toward endline. In teams of anthropometric parameters those who consumed brown rice millets flours for 6 months had greater improvements (ie continuous decline) in the weight, body mass index, and waist circumference as compared to those who consumed white rice, conversely, no improvement in lipid profile was observed for the brown rice and millets, flours groups.

Conclusion: 6-months consumption of millets flours, brown rice was observed.

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AMELIORATION IN β-CELL FUNCTION, INSULIN RESISTANCE AND PANCREAS-PROTECTIVE POTENTIAL OF TRIGONELLA FOENUM SEED EXTRACT THROUGH DPP-IV INHIBITION IN TYPE-2 DIABETIC RATS

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Objectives: DPP-IV inhibition is a novel approach to treatment of T2DM based on incretin hormone action. DPP-IV inhibition by Trigonella foenum(TF) seed might have pleiotropic effect due to DPP-IV receptor present on various tissues. The present study was aimed to evaluate efficacy of Trigonella foenum(TF) seed extract in insulin resistance, β-cell function and pancreas protection by DPP-IV inhibition in corticosteroid induced type-2 diabetic rats by silico, in-vitro and in-vivo studies.

Materials and Methods: T2DM model was induced in wistar rats with high sucrose diet along with dexamethasone. Biochemical, toxicology such as SOD, Catalase, GSH and GPx were evaluated between all the groups, apart from serum DPP-IV inhibition, HOMA-IR HOM-β and HOMA sensitivity also examined. In ex-vivo, hepatic lipid per-oxidation, erythrocytes haemolysis was performed.

Results: The diabetes induction by corticosteroid and high sucrose diet confirmed by HOMA-IR = 2.3 %, HOMA β % = 36.1 % and HOMA sensitivity = 44.1 %. Consequently, the in-vitro assay of DPP-4 inhibition shown 60.4±2.8% % and activity in serum observed 39.1±1.3%. Furthermore, HPLC studies shown presence of Gallic Acid; leading compound present in T. foenum seed extract. Whereas, the FTIR spectra annotated obtainability of potent functional groups. The treatment of T. foenum seed extract caused significant (???? ≤ 0.001)alterations in HOMA indices, insulin and glucose levels along with other linked biochemical parameters. Consequently, the treatment of extract of TF caused significant alterations in pancreas by improving histoarchitectures through enhancing β - cell mass and reorganizations of vascular tissues. Empathetically, the leading compound of extract i.e.gallic acid shown significant binding energies were obtained from -3.6 -3.7 with DPP-IV residues via hydrophobic bonds.

Conclusion: Thus, the study revealed promising results against insulin resistance, β-cell function and protective alterations in pancreas.

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HEPATIC LIPID METABOLISM AND INTESTINAL MICROBIOTA

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**Objectives**: The intestinal microbiota contributes to host physiology and metabolic diseases. Also, disruption of lipid homeostasis is highly associated with development of metabolic diseases. The relationship between intestinal microbiota and lipid metabolic process is still unclear. The present study was to investigate the role of the intestinal microbiota in hepatic lipid metabolism using multiomics and sequencing analyses.

**Materials and Methods**: We analysed hepatic and plasma lipid profiles in germ-free and antibiotic-treated mice using transcriptomics, proteomics, phosphoproteomics and lipidomics. Additionally, we compared the intestinal microbiota composition in antibiotic-treated mice analyzed by 16s sequencing.

**Results**: The intestinal microbiota induced generation of mono-unsaturated fatty acids by stearoyl-CoA desaturase 1. Also, the presence of microbiota leaded to elongation of polyunsaturated fatty acids. Saturated and poly-unsaturated lipids were more abundant in the absence of intestinal microboblota. However, existing microbiota increased primarily mono-unsaturated lipids. A composite prediction score calculated from the observed alterations in fatty acid profiles of germfree mice revealed that antibiotic treatment highly changed fatty acid profiles in untreated controls.

**Conclusion**: These findings demonstrate that the presence of intestinal microbiota promotes fatty acid desaturation and elongation and thus affects general physiology and metabolic diseases.

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DECIPHERING THE PUTATIVE ROLE OF ALPHA-2 ANTIPLASMIN IN PREVENTION OF CARDIOVASCULAR DISEASES AS A NOVEL MASP-1 SUBSTRATE

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**Objectives**: Substrate Identification of MASP-1 using N-terminomics and Proteomics based approach and understanding their relevance in Coagulation Pathway

**Materials and Methods**: Recombinant MASP-1 (rMASP-1) protein was prepared by the method of Dobos et. al. (doi:10.4049/jimmunol.0901141). The serine protease rMASP-1 was employed for the cleavage of yet unidentified and putative substrates of MASP-1 using the N-terminomics and Proteomics based approach. On subjecting the blocked proteins to MASP-1 activity, the new N-termini generated from the substrate cleavage sites were fished out using the positive enrichment strategy of biotinylation and subsequent isolation on avidin column. LC-MS/MS was performed for peptide identification and analyzed using the Trans Proteomic Pipeline (TPP) software. Select serum proteins were validated for their role as MASP-1 substrates.

**Results**: Alpha 2-Antiplasmin was identified to be one of the substrates of MASP-1 by using method involving positive enrichment of putative substrates. On incubation with rMASP-1 for 18 hrs, the intensity of the antiplasmin band decreased as compared to control, as observed on a 12% SDS PAGE gel. Antiplasmin functional assay was also performed to validate the finding. On incubation with rMASP-1, antiplasmin activity was reduced as identified by addition of plasmin and assessing its ability to dissolve clot.

**Conclusion**: In our previous study we found that MASP-1 plays an important role in the dissolution of fibrin clot. Our study confirms that alpha-2 antiplasmin is a substrate of MASP-1 and that it supports the role of dissolution of fibrin clot by cleaving the plasmin inhibitor. Further studies are entailed to employ alpha-2 antiplasmin as drug target for prevention of cardiovascular diseases.
Moderated Poster Presentation

**Moderated Poster Presentation 1,3,5,7,9,11**
Date & Time: September 6 (Fri.), 15:30-16:30
Place: Poster hall (6F)

**Moderated Poster Presentation 2,4,6,8,10,12**
Date & Time: September 7 (Sat.), 14:00-15:00
Place: Poster hall (6F)
Lipid Metabolism / Genetics of Dyslipidemia

MP01-1

DELETION OF THE APOCIII GENE IN KNOCKOUT RABBITS ENHANCES THE CATABOLISM OF TRIGLYCERIDE-RICH LIPOPROTEINS AND ATTENUATES CHOLESTEROL DIET-INDUCED HYPERLIPIDEMIA

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² Basic Science, Analytical Research Center for Experimental Sciences, Saga University, Saga, Japan
³ Basic Science, Center for Advanced Models For Translational Sciences and Therapeutics, University of Michigan Medical Center, Ann Arbor, MI, USA, United States America

Objectives : Apolipoprotein CIII (apoCIII) is a constituent of all lipoproteins except low-density lipoproteins (LDLs) and mediates the metabolism of triglyceride (TG)-rich lipoproteins through inhibition of lipoprotein lipase activity. Elevated plasma levels of apoCIII are directly correlated with the plasma TG and increase the cardiovascular risk. However, the pathophysiological functions of apoCIII in vivo have not been fully elucidated.

Materials and Methods : To examine the functional roles of apoCIII in lipoprotein metabolism and atherosclerosis, we generated apoCIII knockout (KO) rabbits using zinc nuclease technique.

Results : ApoCIII KO rabbits did not show any gross abnormalities. On a normal chow diet, apoCIII KO rabbits exhibited lower plasma levels of TG (up to 43% reduction) than those of wild-type (WT) rabbits while total cholesterol (TC) and HDL-cholesterol levels were unchanged. Analysis of lipoproteins isolated by sequential gradient ultracentrifugation revealed that reduced plasma TG levels in KO rabbits were accompanied by 73% reduction of very low-density lipoproteins (VLDLs) and 57% reduction of intermediate-density lipoproteins (IDLs). In addition, KO rabbits showed faster clearance rate of intralipid emulsion than WT rabbits. On a cholesterol-rich diet, KO rabbits exhibited constantly lower plasma TC and TG levels than WT rabbits, owing to a remarkable reduction of VLDLs, IDLs and LDLs. Effects of apoCIII deficiency on the development of atherosclerosis are currently under investigation.

Conclusion : These results indicate that apoCIII deficiency facilitates TG-rich lipoprotein catabolism and therapeutic inhibition of apoCIII expression may become a novel means for the treatment of hyperlipidemia.

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MP01-2

Withdrawal
Program at a Glance

Day 2

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by

ICoLA 2019

16:00 - 18:00

12:10 - 13:10 LUNCHEON

SYMPOSIUM 2

13:50 - 14:00 BREAK

13:10 - 13:20 BREAK

11:30 - 12:10

11:10 - 11:20 COFFEE BREAK

16:30 - 18:00

18:10 - DINNER

Floor 3F 5F

Room Room 1 Room 2 Room 3 Room 4 Room 5

SEOUL KOREA

September 5(Thu.) - 7(Sat.), 2019

SEOUL KOREA

PRESENTATION

SYMPOSIUM 1

Laurent Yvan-Charvet (Institut National de la Santé et de la Recherche Médicale, France)

(SoLo-AAS)

SYMPOSIUM 3

(SoLo-JAS)

SYMPOSIUM 4

(SoLo-IAS)

LUNCHEON

Kenneth Walsh (University of Virginia, USA)

SPECIAL LECTURE 1

BREAKFAST

SYMPOSIUM 6

LUNCHEON

BREAKFAST

SPECIAL LECTURE 2

Metformin: Is it a Cardiovascular Drug?

Ira J. Goldberg (New York University, USA)

MODERATED POSTER PRESENTATION 2

LUNCHEON

(Room 1+2+3)

(KSoLA-EAS)

SYMPOSIUM 10

PUBLICATION

SESSION

09:40 - 11:10

08:00 - 09:00 BREAKFAST

05

04

Program at a Glance

Day 3

September 5(Thu.) - 7(Sat.), 2019

SEOUL KOREA

ICoLA 2019 by KSoLA

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05

04

Program at a Glance

1

Presenting Author :

with PA and those with essential hypertension who have high ARR only. It seems that the treatment of PA does not significantly impact

Conclusion :

adrenalectomy or medical treatment.

Materials and Methods :

Eighty FH patients were drawn from the Korean FH Registry. Genetic testing for LDLR, APOB, and PCSK9 was performed. Patients were initially prescribed atorvastatin 10 mg or similarly potent agents, and the regimens were adjusted to maximal tolerable dose over six to 12 months to achieve the low-density lipoprotein-cholesterol (LDL-C) target of 100 mg/dL. Treatment results were compared between patients classified by identified mutations. The primary and secondary outcome variables were the achieved percentage of expected LDL-C reduction and the achievement rate of LDL-C target, respectively.

Results :

Of 80 patients, 27 showed mutation in three genes: 24 in LDLR (seven null and 17 defective), two in APOB, and one in PCSK9. In the study population, LDL-C decreased from 213 mg/dL to 105 mg/dL. The primary outcome variable was lower in mutation-positive-compared to mutation-negative patients (88.9% and 107.0%, respectively, p=0.005). Although the variable was similar between the carriers of LDLR mutations and those of others, it was lower in the carriers of null- than those of defective mutations (70.6% and 91.5%, respectively, p=0.01). The secondary outcome variable was lower in the mutation carriers than others (22.2% and 40.0%, respectively, p=0.03). Although the rate was lower, but not significantly, in LDLR mutation carriers compared to those with others (16.7% and 66.7%, p=0.12). The rate was not different between patients with null- and those with defective mutations.

Conclusion :

In patients with FH receiving maximal statin/ezetimibe therapy, achieved treatment response and target achievement were lower in mutation carriers than in other individuals. The impact of mutation category was more prominent than that of mutated genes.

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ASSOCIATION OF DYSLIPIDEMIA WITH PRIMARY ALDOSTERONISM IN KOREA

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Objectives :

There have been controversies about an association between primary aldosteronism (PA) and dyslipidemia, and little is known in the Asian population. Therefore, the aim of this study is to evaluate the association between patients with PA and dyslipidemia in Korea.

Materials and Methods :

A retrospective review of medical records at Seoul National University Hospital from 2000 to 2018 was performed. The records of PA patients were retrieved using diagnosis code, saline-infusion test (SIT), captopril challenge test (CCT), or adrenal vein sampling data. PA patients were subdivided into the surgery group and the medical treatment group. Control subjects were selected as patients who had a high aldosterone-renin ratio (ARR) but were not diagnosed with PA (negative for SIT and/or CCT). Lipid profiles were analyzed cross-sectionally, among patients who had not used anti-hyperlipidemic agents. In addition, we compared the lipid profile of PA patients before and after 1 year of surgery or medical treatment.

Results :

There were 125 PA patients (55 medically treated, 70 surgically treated), and 68 control subjects who were not using anti-hyperlipidemic agents. Level of total cholesterol, low-density lipoproteins, and triglyceride did not differ among groups statistically. High-density lipoproteins levels were higher in surgically treated PA group than the control group (56.1 ± 15.4 mg/dL vs 49.4 ± 14.4 mg/dL, P = 0.023 with Bonferroni), however, the statistical difference was disappeared when comparing control with total PA group (P = 0.074). There was no significant difference between pre-treatment and post-treatment levels of lipid profiles in PA patients who underwent adrenalecctomy or medical treatment.

Conclusion :

In this analysis conducted in Korea, it is unlikely that the prevalence of dyslipidemia differs significantly between patients with PA and those with essential hypertension who have high ARR only. It seems that the treatment of PA does not significantly impact on lipid metabolisms.

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COXSACKIEVIRUS AND ADENOVIRUS RECEPTOR MEDIATE NONALCOHOLIC FATTY LIVER DISEASES; A NOVEL INTERACTION PARTNER FOR APOBEC3

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Objectives: Coxsackievirus and adenovirus receptor (CAR) is expressed in epithelial and vascular endothelial cells where it localizes at the tight junction complexes. However, the main playing role of CAR in the vascular endothelial junction and lipid transport were not proven yet. CAR is an important regulator of epithelial tight junction homeostasis and endothelial paracellular permeability. Endothelial CAR deletion may mediate nonalcoholic fatty liver diseases (NAFLD).

Materials and Methods: We generated endothelial or hepatocyte-specific CAR knockout mice using a CAR floxed allele with Tie2 or Albumin Cre mice. Mice were fed by calories 60% fat diet for 16 weeks. Body weight change and liver lipid accumulation were observed. The novel interaction molecule was defined by pull-down assay and mass-spec.

Results: Endothelial-CAR deletion induced lipid accumulation in the liver at 8 month-old ages. In 16 weeks high-fat diet, CAR knockout mouse developed non-alcoholic fatty liver diseases and increase blood glucose level with inflammatory cell infiltration in the liver. CAR interacts with APOBEC3, which modulates ApoB expression and lipid transfer.

Conclusion: CAR interacts with APOBEC3 and regulates ApoB expression. CAR plays an important role in lipid accumulation in the liver and may be a novel therapeutic target for NAFLD.

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ASSOCIATIONS OF MTHYLENETETRAHYDROFOLATE REDUCTASE GENE POLYMORPHISMS (C677T AND A1298C) AND ISCHEMIC STROKE IN INDIAN PATIENTS

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Objectives: The association between the 5,10-methylenetetrahydrofolate reductase (MTHFR) genetic polymorphism and ischemic stroke has been reported by a number of investigators. But data are conflicting concerning the association between consecutive ischemic stroke and MTHFR C677T and A1298C mutation and conventional risk factors. Studies addressing this matter in developing countries are limited. The aim of this study was to explore the association between the MTHFR variants C677T and A1298C and the risk of ischemic stroke in Indian population.

Materials and Methods: Study population included 92 patients with ischemic stroke, whose mean age was 57 (30-83) years; among them, 24 were females and 68 were male. MTHFR gene polymorphism was present in 38% and 58% for C677T and A1298C respectively. Out of 58% mutant cases of A1298C, 18.48% were homozygous mutant and 56.52% were heterozygous for both the alleles. However, 27% and 24% normal were found to be heterozygous and homozygous mutant respectively for A1298C. In addition, 18% normal were heterozygous for C677T. The mutations were under Hardy Weinberg equilibrium.

Results: There were (92) patients with ischemic stroke, whose mean age was 57 (30-83) years; among them, 24 were females and 68 were male. MTHFR gene polymorphism was present in 38% and 58% for C677T and A1298C respectively. Out of 58% mutant cases of A1298C, 18.48% were homozygous mutant and 56.52% were heterozygous for both the alleles. However, 27% and 24% normal were found to be heterozygous and homozygous mutant respectively for A1298C. In addition, 18% normal were heterozygous for C677T. The mutations were under Hardy Weinberg equilibrium.

Conclusion: We concluded that the A1298C polymorphism and the haplotypes C-677-C-1298 and T-677-C-1298 in MTHFR might modulate the risk of ischemic stroke in Indian population.

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Pathophysiology of Atherosclerosis / Vascular Biology

**MP02-1**

**GENE EXPRESSION PROFILES OF TRANSCRIPTS IN AORTIC VALVES FROM HYPERLIPIDEMIC MICE**

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**Objectives**: Since advanced aortic valve stenosis (AVS) lesion is considered as irreversible, it is important to focus on the early stage of AVS. Currently, it is thought that inflammation and lipid deposition are involved in the initial stage of AVS, which is valvular sclerosis. Thus, we analyzed the gene expression profiles in aortic valves of hyperlipidemic LDLR KO mice.

**Materials and Methods**: We performed transcriptomic analyses using RNA sequencing on aortic valve tissues from WD-fed LDLR KO mice and compared with its chow diet-fed controls.

**Results**: We found cholesterol efflux related genes are upregulated in WD-fed LDLR KO. In pathway analyses using Ingenuity Pathway Analysis (IPA), we identify which canonical pathway is enriched and upregulated or inhibited in sclerotic aortic valves of WD-fed LDLR KO mice. We further performed single cell RNA sequencing of aortic valvular cells from hyperlipidemic mice.

**Conclusion**: We expect that these data will be helpful to understand the molecular and immunological mechanisms in initial stage of AVS.

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**MP02-2**

**DESIGNATED SECRETORY APE1/REF-1 INHIBITS INFLAMMATORY RESPONSES IN LIPOPOLYSACCHARIDE-INDUCED ENDOTOXEMIC MICE**

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**Objectives**: Apurinic apyrimidinic endonuclease1/Redox factor-1 (Ref-1) is a multifunctional protein. Despite recent information in Ref-1 research against inflammation, the biological function of the secreted Ref-1 remains unknown especially in vivo condition. The aim of this study is to evaluate the possible roles of secreted Ref-1 in vivo lipopolysaccharide-induced systemic inflammation.

**Materials and Methods**: To investigate the role of extracellular APE1/Ref-1 in circulation system, we developed the designated secretory APE1/Ref-1, PPT-LS-APE1/Ref-1, which is an adenoviral vector system targeting to secrete APE1/Ref-1 in systemic circulation. We used two vascular cells (HUVEC endothelial cells, RAW 264.7 macrophages) and a septic mouse model to study the anti-inflammatory effects of secreted APE1/Ref-1.

**Results**: Our results demonstrated that secretory APE1/Ref-1 treatment inhibited the expression of inflammation markers in vascular cells, decreased the production of LPS-induced cytokines and chemokine, protected LPS-induced tissue damage from LPS-induced septic mouse.

**Conclusion**: These results provide new insights into the mechanism of anti-inflammatory effects of secretory APE1/Ref-1, and a new indication for secretory APE1/Ref-1 for the treatment of sepsis.

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TELMSARTAN INHIBITS VASCULAR CONTRACTION VIA AMP-ACTIVATED KINASE (AMPK)-MEDIATED PROTEOSOMAL DEGRADATION OF MYOSIN LIGHT CHAIN KINASE (MLCK) IN RAT VASCULAR SMOOTH MUSCLE CELLS AND AORTAS

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Objectives: Telmisartan, an angiotensin II type 1 receptor blocker (ARB), is widely used for the treatment of patients with hypertension. Telmisartan has various ancillary effects in addition to common blood pressure-lowering effects. Previously, we reported that telmisartan attenuated vascular inflammation in endothelial cells. Although dysfunction of vascular smooth muscle cells (VSMC) contributes to the development of various vascular diseases including atherosclerosis, hypertension, and vascular restenosis, the effects and mechanism of telmisartan on VSMC functions have not been fully elucidated. Here, we investigated how telmisartan regulates vascular contraction in rat VSMC and aortas.

Materials and Methods: We performed inhibitor studies, real-time RT-qPCR, western blot analysis, overexpression of dominant negative (dn)-AMP-activated protein kinase (AMPK) gene, and ex vivo aortic contraction assay.

Results: Telmisartan time- and dose-dependently inhibited myosin light chain kinase (MLCK) protein expression with no alteration of mlck mRNA level and consequently decreased phosphorylation of myosin light chain (MLC) at Ser19 (p-MLC-Ser19) in rat VSMC. MG-132, a proteasome inhibitor, but not doxycycline, a metalloproteinase inhibitor, significantly restored telmisartan-inhibited MLCK expression and p-MLC-Ser19. Furthermore, telmisartan time- and dose-dependently increased p-AMPK-Thr172, and compound C, an AMPK inhibitor, or ectopic expression of dn-AMPK gene significantly reversed telmisartan-inhibited MLCK expression and p-MLC-Ser19. These telmisartan’s effects were not changed by GW9662, a specific and irreversible peroxisome proliferator-activated receptor γ (PPARγ). Among ARBs, including losartan and fimasartan, only telmisartan inhibited MLCK expression and p-MLC-Ser19. Similar to in vitro results, telmisartan decreased MLCK expression and p-MLC-Ser19, and increased p-AMPK-Thr172 in rat aortas. Finally, telmisartan attenuated phenylephrine-induced vessel contraction in rat aortas and these effects were significantly reversed by co-treatment with MG-132 or compound C.

Conclusion: Taken together, we demonstrate that telmisartan inhibits vascular contraction in rat VSMC and aortas, at least in part, by decreasing MLCK protein in which AMPK mediates proteosomal degradation of MLCK.

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SOLUBLE RAGE ATTENUATES ANG II-INDUCED ARTERIAL INTIMA CALCIFICATION

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Objectives: Arterial intima calcification (AIC) is a major feature of advanced atherosclerosis and angiotensin II (Ang II) is known to exacerbate AIC and osteogenic differentiation of vascular smooth muscle cells. Although recent studies suggested that receptor for AGEs (RAGE)-mediated signaling plays important roles in vascular calcification, detailed mechanism remains unclear. Therefore, we investigated the RAGE-mediated signaling pathways and the therapeutic efficacy of soluble RAGE (sRAGE), a decoy receptor for RAGE, in Ang II-induced AIC.

Materials and Methods: To determine the effect of RAGE blockade on Ang II-induced AIC, human aortic smooth muscle cells (HASMCs) were treated with Ang II for 14 days with or without sRAGE. Calcification of HASMCs was estimated by cellular calcium content and alizarin red staining. The protective effect of sRAGE was evaluated in ex vivo culture model using aortas from apolipoprotein E Knockout (Apo E KO) mice (n per group=5), which was visualized by von kossa staining.

Results: Ang II significantly increased the calcification of HASMCs, and Ang II-induced activation of RAGE was mediated by AT1R activation and subsequent HMGB1 release. Furthermore, sRAGE attenuated HMGB1 secretion and RAGE-mediated PKC-ERK/p38/JNK-NF-kB activation in the early phase of AIC. Also, sRAGE attenuated Ang II induced osteogenic differentiation of vascular smooth muscle cells in vitro. The ex vivo study indicated that Ang II significantly induced calcium deposition in the aorta but it was significantly attenuated by sRAGE.

Conclusion: Overall, these studies identify that RAGE-mediated regulation of early phase is critical for Ang II-induced AIC and guarantee additional in vivo studies to further assess the therapeutic potential of sRAGE.

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**EVIDENCE FOR ADDITIONAL SUPPORTIVE ROLE OF MBL ASSOCIATED PROTEASES IN DISSOLUTION OF FIBRIN CLOTS**

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**Objectives**: Platelet plug or thrombus formation is initiated by interaction of platelet receptors with components of extracellular matrix (ECM) of injured vessels. Fibrinectin is both an ECM component and moderately abundant glycoprotein in blood, present at 300 to 400 μg/mL in plasma and 0.5 μg per 3×10⁹ platelets in platelet α-granules. MASP-1 has blood dissolving capability by activating plasminogen. Plasma fibrinectin provide blood clot stability by interacting with fibrin. In our study we find that fibrinectin could be new putative substrate of MASP-1.

**Materials and Methods**: rMASP-1 was expressed in BL21 (DE3) PlyS cell and purified by SP Sepharose and Superdex 200 column in FPLC. Human MBL (hMBL) was prepared from discarded blood by affinity chromatography. Purity of fibrinectin was checked on SDS-PAGE and extra bands identified by MALDI-TOF which revealed presence of fibrinectin. Fibrinectin cleavage assay was performed with rMASP-1 and hMBL associated protease. Time dependent cleavage of fibrinectin with rMASP-1 at their physiological concentration was also performed.

**Results**: rMASP-1 based fluorogenic activity and fibrinectin cleavage assay confirm functional integrity of the enzyme. The impurity of fibrinectin that was digested by rMASP-1 was fibrinectin which was confirmed by MALDI-TOF. In fibrinectin cleavage assay at their physiological concentration fibrinectin is completely digested by rMASP-1 as well as hMBL associated protease. In time dependent cleavage assay, fibrinectin is completely digested in 4 hours.

**Conclusion**: Our results showed that the rMASP-1 have the capability to digest plasma fibrinectin completely leading to dissolution of fibrin network in blood clot.

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**DOWN REGULATION OF INFLAMMATORY MEDIATORS AND MAPK P38 SIGNAL PATHWAY BY NARINGENIN CHALLENGED IN HIGH CHOLESTEROL RICH DIET MEDIATED ATHEROSCLEROSIS**

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**Objectives**: Constriction, narrowing and hardening of arteries collectively called as Atherosclerosis (AS) and as resultant there is build up of fatty materials including cholesterol in them. This is associated with cardiovascular disease viz., strokes, acute coronary syndrome and heart attack, severely detrimental to human health. Several researchers suggest that inflammatory response especially interleukins (predominantly 6 and 1 β), C-reactive protein, tumour necrosis factor-α (TNF-α) and stimulation of p38 MAPK signaling play a significant role in the expansion of atherosclerosis. The present work decipher the molecular mechanism of naringenin to inhibit artherosclerosis in high cholesterol diet (HCD) in rats.

**Materials and Methods**: Molinspiration software elucidated Lipinski’s Rule of 5. Molecular docking study was used to estimation the binding affinity of naringenin with Niemann Pick C1 like1 protein (NPC111), CRP, farnesoid X receptor (FXR) and lanosteral 14α-demethylase (LDM) via using the 3QNT, 1OSH and 3DL6 PDB. Vitamin D and high fat diet was used for induction the atherosclerosis and rats were received the single oral administration of naringenin and simvastatin in 14 weeks. Lipid parameters, antioxidant parameters and pro-inflammatory cytokines viz., IL 6 and 1 β, CRP, TNF-α and CRP were estimated, respectively. Further, the expression of phosphorylated p38 (p-p38) MAPK expression was estimated.

**Results**: Naringenin molecule extremely buried in the cavity of NPC111, CRP, FXR and LDM domain via interacting with HIS-124, GLY-688, LEU-103, GLY-665, PHE-347 and GLU-138. AS group rats showed the modulation of lipid, antioxidant and serum parameters. Naringenin altered lipid parameters such as TC (56%), TG (64%), HDL (45%), LDL (65%), VLDL (57%); antioxidant including SOD (75%), MDA (80%); pro-inflammatory viz., TNF-α (75%), IL-6 (59%), IL-1 (53%) and CPR (68%), respectively. Naringenin also significantly down-regulated the p-p38 MAPK expression (42%).

**Conclusion**: On the basis of result, we can conclude that naringenin sown-regulated the HCD induced Atherosclerosis via down-regulation of p-p38 MAPK pathway.

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Hypertension

MP03-1

RISK FOR DEVELOPING CARDIOVASCULAR DISEASE IN HYPERTENSION WITH CONTROLLED VERSUS UNCONTROLLED BLOOD PRESSURE: A RESULT FROM THREE PRIMARY CARE SETTINGS IN THAILAND

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Objectives: Hypertension treatment is target to blood pressure controlled and to reduce risk for developing CVD. Little is known whether those hypertension with uncontrolled and controlled blood pressure had differences risk for developing CVD. We examined risk levels and risk score for developing CVD among hypertension with uncontrolled versus controlled blood pressure.

Materials and Methods: Data from three cross-sectional studies which consisted of 782 hypertension treated at three primary care units in Thailand. Risk for developing CVD was calculate using the Framingham risk prediction for global CVD, which scoring based on sex, and treated systolic blood pressure. Six major risk factors for CVD were included of age, high density lipoprotein (HDL-C), total cholesterol, systolic blood pressure (SBP), smoking, and diabetes. Three risk levels were defined based on CVD risk score and % predictive as mild (<6%), moderate (6-20%), or high (>20%) risk for developing CVD.

Results: There were nearly a half of uncontrolled (48.2%) and controlled (51.8%) blood pressure groups. Uncontrolled group had higher rates of high-risk level compared to controlled hypertension group (64.2 vs 31.9%; OR 1.98; 95%CI 1.69-2.32). Uncontrolled group had higher mean CVD score (18.6±3.84 vs 15.15±3.91, p=0.000) and CVD risk predictive % (23.3±7.29 vs 16.12±8.01, p=0.000) compare to controlled group. They had higher score on the indexes of SBP (p=0.000), and smoking (p=0.000). Moreover, uncontrolled group had higher mean SBP (p=0.000), DBP (p=0.000), FPG (p=0.001) and LDL-C (p=0.049). Uncontrolled group was more likely found in men (p=0.000), younger adult aged less than 55 years old (p=0.041), had DBP ≥90 mmHg (p=0.000), and had LDL-C ≥160 mg.dl (p=0.011) compared to controlled group.

Conclusion: Although hypertension with uncontrolled blood pressure had higher risk score for CVD as expected, scores of 4 among 6 major risk factors were not differences. On other hand, controlled group had only 2 lower risk indexes, SBP and smoking.

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MP03-2

TREATMENT OF DYSLIPIDEMIA AND HYPERTENSION BY SHORT TERM CONSUMPTION OF CUBAN POLICOSANOL VIA ENHANCEMENT OF HIGH-DENSITY LIPOPROTEINS QUANTITY AND QUALITY

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Objectives: Metabolic syndrome is closely associated with higher risk of hypertension, cardiovascular disease, diabetes and stroke. It has been reported that Cuban policosanol improves lipid parameters and HDL functionality in human participants. The aim of the present study was to investigate the long-term effects of policosanol supplementation on blood pressure (BP) and the lipid profile in healthy Korean participants with pre-hypertension.

Materials and Methods: This randomized, double-blinded, and placebo-controlled trial included 84 healthy participants who were randomly assigned to three groups receiving 10 mg of policosanol, 20 mg of policosanol, or placebo for 12 weeks.

Results: The policosanol consumption for 12 weeks, the policosanol 20 mg group exhibited the most significant reduction of BP, up to 7.7% reduction of average systolic BP (SBP) from 136.3±6.1 mmHg (week 0) to 125.8±8.7 mmHg (p<0.001). Between group comparisons using repeated measures ANOVA analysis showed that the policosanol 20 mg group had a significant reduction of SBP (p=0.020) and a reduction of DBP (p=0.035). The policosanol 10 mg and 20 mg groups showed significant reductions in aortic SBP of 7.4% and 8.3%, respectively. The policosanol groups showed significant reductions of total cholesterol (TC) of 9.6% and 8.6% for 10 mg and 20 mg of policosanol, respectively. Lipoprotein functionality improved by policosanol to be more anti-atherogenic; LDL showed more anti-oxidant while HDL showed more anti-glycation properties

Conclusion: Short-term consumption of Cuban policosanol resulted in significant reductions of peripheral SBP and DBP, aortic SBP and DBP, and mean arterial pressure (MAP) and serum TC and LDL-C with elevation of %HDL-C.

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DO NORMAL WEIGHT AND OVERWEIGHT HYPERTENSION HAD DIFFERENCES RISK FOR DEVELOPING CARDIOVASCULAR DISEASE?

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**Objectives :** Risk for developing cardiovascular disease (CVD) is stratified based on a group of major risk factors. Unfortunately, body weight had no longer taken into account in the risk model. We compare risk score and risk level for developing CVD among hypertension with normal versus overweight.

**Materials and Methods :** Sample was 782 hypertension treated at 3 primary care units in Southern Thailand. Risk for CVD was estimated based on the Framingham Heart Study-General Cardiovascular Risk Profile. CVD risk point score was ranged from ≤2 to ≥21 with estimated % of <1 to >30%. Risk level could be stratify into 3 levels as low (score ≤2 to 9), moderate (score 10-17) and high (score ≥18) risk groups. We defined normal weight (BMI <23) and overweight (BMI ≥23) based on Asian population’s criteria.

**Results :** Approximately 66% had BMI ≥23. Prevalence of overweight (BMI 23.0-24.9), obesity stage 1 (BMI 25.0-29.9), and obesity stage 2 (BMI ≥30.0) were 18.9%, 33.2%, and 14.1%. An overweight group had lower CVD risk score (16.18±4.35 vs 17.90±3.83, p<0.001), and had lower CVD risk estimated % (18.27±8.71 vs 21.64±7.72, p<0.001), compared to a normal weight group. Overweight group had less score on age (p<0.001), while they had higher score on HDL (p=0.011) indexes. Mean score on SBP, cholesterol, diabetes, and smoking were not significantly differences. Normal weight group had higher rate of high risk for CVD (OR 1.48, 95%CI 1.21-1.81), compared to overweight.

**Conclusion :** This was surprised and far from our expected of the finding that overweight hypertension had lower risk for developing CVD. However, our evidence pointed out that age index was a major matter of this CVD risk difference. The older aged has increasing score on CVD risk index. Other explanation is that, overweight hypertension might be had more awareness on their risk of developing CVD than the normal weight hypertension.

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LONG TERM PROGNOSIS OF PATIENTS WHO PRESENTED HYPERTENSIVE EMERGENCY AND URGENCY IN MONGOLIA

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**Objectives :** Hypertensive emergency and urgency are form of severe high blood pressure and often related to poor short term prognosis. However, long term prognosis of those conditions is mostly unclear in Mongolia. In this study, we aimed to evaluate long term prognosis of hypertensive emergency and urgency in patients who visited to ED.

**Materials and Methods :** We selected patients who visited ED due to severe high blood pressure from January 2017 to September 2017. Diagnosis of hypertensive emergency and urgency was made according to the related ESC guidelines of arterial hypertension. All cause mortality was chosen for study endpoint. Univariable and multivariable Cox proportional hazard regression was used to reveal association between possible predictors and study endpoint.

**Results :** A total of 74 patients with severe high blood pressure were selected (mean age 69±11, 37.8% male). Prevalence of hypertensive emergency was 33.8% (n=25) and 66.2% (n=49). Non-adherent or discontinuation of hypertension drug was main cause of severe elevation of blood pressure (86.5%, n=64). Median follow-up was 20 months (IQR 14; 22) and all-cause mortality was occurred in 8 patients (10.8%): 16% (4 out of 25 patients) for hypertensive emergency and 8.2% (4 out of 49 patients) for hypertensive urgency. Univariable analysis was revealed that age (HR=1.10, 95% CI 1.03-1.19, p<0.01) and diastolic BP (HR=0.95, 95% CI 0.89-1.00, p=0.055) are possible predictors of all-cause mortality. Kaplan-Meier estimation for all-cause mortality was determined that no difference between hypertensive emergency and urgency during long term follow-up (log rank p=0.344) (Figure 1).

**Conclusion :** Both hypertensive emergency and urgency are severe form of hypertension and associated with poor long term prognosis.

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ASSOCIATION OF SELF-CARE AND MICROALBUMINURIA (MAU) AMONG NON-OBESE HYPERTENSION

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Objectives: We believe that adequate self-care may reduce cardiovascular disease and target organ damage in hypertension. None of previous studied on self-care in hypertension were addressed this issue. Microalbuminuria (MAU) is a well-recognized marker of organ damage and sub-clinical CVD in hypertension. Association of MAU with obesity were well documented, but less in non-obese persons. We considered self-care and MAU in non-obese hypertension because of a less recognized. Our aim was to examine the correlation of self-care and MAU in non-obese hypertension.

Materials and Methods: From a total of 1,461 hypertension attended 11 primary care settings in southern Thailand, 571 were non-obese, and 302 cases were eligible. The Self-Care Maintenance for Hypertension Index (SCMT-HTI), Thai version, was used to assess self-care on follow-up, medication, diet, exercise, weight control, alcohol, and smoking. We modified from the original version of Barbara Riegel’s SCHTI. Response method was a 4 rating scale from 1, never or rarely to 4, always or daily. As original version, scores on each regimen and total self-care were standardized to a score of 100, which a score of <70 indicated poor self-care. Independent t-test, Chi-square, and binary logistic regression were employed.

Results: Prevalence of MAU was 42.4%. Compared with non-MAU, patients with MAU had significant higher scores on follow-up, medication, diet, exercise, and total self-care regimens. Rates of poor self-care on each regimen were 79% diet, 61% follow-up, 60% exercise, 44% weight control, 27% medication, 17% alcohol, 10% smoking, and 47% total self-care. Patients with MAU had higher rates of poor self-care on diet (86% vs 54%, p=0.009), follow-up (69% vs 55%, p=0.017), exercise (69% vs 54%, p=0.010), medication (36% vs 27%, p=0.003), and total self-care (59% vs 22%, p=0.001) compared with non-MAU.

Conclusion: Non-obese hypertension with MAU have poor self-care. Improving self-care on follow-up, diet, exercise, and medication may reduce cardiovascular risk in hypertension.

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DEVELOPMENT OF NON-INVASIVE LIPID MEASURING INSTRUMENT IN BLOOD

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Objectives: Postprandial hyperlipidemia is one of the causes in metabolic syndrome (MetS) and is a trigger for various diseases. Chylomicron remnant (CM-R) generates after eating and is known to exist in blood in case of postprandial hyperlipidemia at longer time than that of healthy person. It is easy to observe the CM-R in vitro. In vivo, however, it is difficult to observe, because of subcutaneous tissue existing into light path. Therefore, drawing blood is required to observe the CM-R, and needs to be repeated many times to check temporal changes.

To address this issue, we developed non-invasive instrument measuring turbidity in blood with using near-infrared light, on the basis of light diffusion theory.

Materials and Methods: In order to remove the influence of the complexity of the tissue and structure of the living body, a homogeneous simulated human body (phantom) was measured, in which concentration of scattering material is adjusted. Fat loading test was also performed with developed instrument.

Results: From results, it is found that our developing apparatus has reproducibility within 3 % for phantom measuring, and resolution discriminating 0.05 % concentration change of scattering material. In addition, the result of fat loading test shows to have a good correlation between triglyceride (TG) in CM and VLDL, and measurement value.

Conclusion: Obtained turbidity with our apparatus shows good correlation to TG. Hence with using our apparatus, lipid measurement is possible without drawing blood. By further improving the accuracy in the future, it may be considered that clinical application is also possible.

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Atherosclerosis, Dyslipidemia, and Therapeutics

**MP04-1**

**COMPARISON OF MEDICATION ADHERENCE BETWEEN FIXED-DOSE COMBINATION AND FREE-COMBINATION OF ANGIOTENSINOPHOB RECEPTOR BLOCKER AND STATIN: A NATIONWIDE RETROSPECTIVE LONGITUDINAL COHORT STUDY**

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**Objectives:** Non-adherence to angiotensin receptor blockers (ARB) or statin is one of major reasons of insufficient treatment for patients with hyperlipidemia and hypertension. We investigated whether fixed-dose combination (FDC) of ARB and statin improved adherence compared to traditional free combination (FC).

**Materials and Methods:** In this retrospective nationwide cohort study, adherence of 128,369 patients who started ARB and statin including atorvastatin or rosuvastatin between July 2014 and June 2015 was investigated. Primary endpoint was proportion of days covered (PDC) per 180 days up to day 540. Good compliance defined by PDC≥80% and persistence rate defined by patients remaining on medication were also investigated.

**Results:** Patients were 62.9 years of mean age with 48.2% female gender. Compared to FC (N=90,759, 70.7%), FDC (N=37,610, 29.3%) showed higher PDC at day 180 (86% vs 70%), 360 (77% vs 62%), and 540 (74% vs 55%, p<0.001, all). Frequency of PDC≥80% was also higher in FDC compared to FC at day 180 (80.1% vs 51.8%), 360 (71.7% vs 54.2%), and 540 (69.2% vs 49.3%, p<0.001, all). Persistence rate at day 540 was higher in FDC compared to FC (50.4% vs 27.3%, p<0.001). The mean decline in PDC per 180 days were significantly lower in FDC compared to FC per 180 days (6.0% vs 7.5%, p<0.001).

**Conclusion:** In this real-world data analysis, FDC resulted in higher medication adherence and persistence compared to FC among patients who started both ARB and atorvastatin or rosuvastatin.

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**MP04-2**

**COMPARISON OF THE EFFICACY AND SAFETY BETWEEN ROSUVASTATIN/EZETIMIBE COMBINATION AND ROSUVASTATIN MONOTHERAPY IN PATIENTS WITH DIABETES AND HYPERCHOLESTEROLEMIA**


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**Objectives:** Diabetes and hypercholesterolemia is well-known risk factors for cardiovascular disease. The apolipoprotein B/A1 ratio is an effective predictor of incident cardiovascular disease. Statin and ezetimibe combination therapy have been reported additional cardioprotective effects over statin monotherapy. We aimed to assess the efficacy and safety of combination treatment of rosuvastatin with ezetimibe in patients with diabetes and hypercholesterolemia.

**Materials and Methods:** In this multicenter, randomized, open-label study, we randomly assigned patients (total, n=140) with diabetes and hypercholesterolemia to receive rosuvastatin/ezetimibe (5mg/10mg, n=70) combination therapy or rosuvastatin (10mg, n=70) monotherapy for 8 weeks. The primary endpoint was the percentage change in apoB/A1 ratio from baseline to week 8.

**Results:** After the 8-week treatment, the percentage change in apoB/A1 ratio reduction were significantly decreased in the rosuvastatin/ezetimibe group than in the rosuvastatin group (-46.14±1.58% vs -41.30±1.58%, P=0.03). In addition, the percentage of patients achieving ≥50% reduction in LDL cholesterol was 76.5% (52/68) in the rosuvastatin/ezetimibe group and 47.1% (32/68) in the rosuvastatin group (P=0.0004), and the percentage of patients achieving comprehensive lipid target without drop-out due to adverse events was 73.5% (50/68) in the rosuvastatin/ezetimibe group and 45.6% (31/68) in the rosuvastatin group (P=0.0009). Moreover, the reduction from baseline to week 8 of total cholesterol, non-HDL cholesterol, LDL cholesterol, and apo B were greater in the rosuvastatin/ezetimibe group than in the rosuvastatin group. Both treatments were generally well tolerated, and there were no statistically significant differences in drug-related adverse events.

**Conclusion:** A 8-week combination therapy of rosuvastatin and ezetimibe showed a significant reduction in apoB/A1 ratio, a predictor of future cardiovascular disease, without increasing adverse event compared to rosuvastatin monotherapy in the patient with diabetes and hypercholesterolemia.

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CORRELATION BETWEEN THYROID HORMONE REPLACEMENT THERAPY AND LIPID METABOLISM IN PATIENTS TREATED WITH TOTAL THYROIDECTOMY OR HEMITHYROIDECTOMY: A SINGLE CENTER STUDY

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Objectives: Hypothyroidism is closely related to dyslipidemia. There is still debate as to which patients need hormone replacement therapy (HRT) after hemithyroidectomy (HT), and little is known about the effect of HRT after HT. To address this, we aimed to investigate the effect of HRT in the incidence of dyslipidemia among three groups: TT with HRT (TT+HRT), HT with HRT (HT+HRT) or without HRT (HT-HRT).

Materials and Methods: This was a retrospective cohort study, and 3,057 patients who underwent thyroidectomy at Yeungnam university hospital in 2011-2014 were included. We excluded subjects diagnosed as dyslipidemia, hypothyroidism before surgery and taking lipid-lowering agents. Dyslipidemia was defined as triglyceride ≥200mg/dl, low-density-lipoprotein ≥160mg/dl, total-cholesterol ≥240mg/dl, or high-density-lipoprotein ≤40mg/dl. Thyroid-stimulating hormone (TSH) level and lipid profiles were assessed annually for 5 years.

Results: 545 participants were finally enrolled and divided into 3 groups; TT+HRT (n=436), HT +HRT (n=37), and HT-HRT (n=72). The mean age was 52.96 and females were 87.9%. The occurrence rate of dyslipidemia in TT+HRT and HT+HRT was 28.7% (hazard ratio [HR] = 1.389; 95% confidence interval [CI] = 0.825-2.339, p=0.216) and 45.9% (HR = 2.634, 95% CI = 1.329-5.221, p=0.006), as compared with 22.2% in HT-HRT (p-for-trend=0.015). The mean TSH level at the end of follow-up was not significantly different (p=0.410).

Conclusion: Even TSH level was not different between HT groups, HT+HRT group showed higher dyslipidemia incidence rate than HT-HRT group. These results suggest that surveillance for dyslipidemia may be necessary in patients with HT who need HRT.

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ANGPTL4 REGULATES INFLAMMATION AND REDUCES ATHEROSCLEROSIS IN HYPERLIPIDEMIC APOE-DEFICIENT MICE

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Objectives: Atherosclerosis is a chronic inflammatory disease of the arterial walls that often leads to myocardial infarction and stroke. Angiopoietin-like protein 4 (ANGPTL4) has been shown to regulate lipoprotein metabolism through the inhibition of lipoprotein lipase (LPL). Recently, ANGPTL4 has been implicated in many inflammation-associated diseases. The aim of this study is to investigate the potential protective effects of ANGPTL4 on vulnerable plaques.

Materials and Methods: We established a vulnerable atherosclerotic plaque mouse model through partial ligation of left common carotid artery and conventional atherosclerosis induced in ApoE deficient atherosclerosis mice fed a high fat diet. ApoE deficient mice were injected intraperitoneally with a recombinant ANGPTL4 protein. Inflammatory mediators in mouse plasma were evaluated by ELISA. The size of plaque area in carotid artery and aorta was evaluated by Oil Red O and hematoxylin/eosin (HE) staining. Necrotic core area analysed from Masson Trichrome stained sections. Characteristics of stable plaque, such as plaque collagen content was evaluated from Picro Sirius Red staining.

Results: We found that ANGPTL4 suppresses endothelial inflammation in vitro. ANGPTL4 significantly reduced atherosclerosis, assessed by Oil red O staining of the carotid artery, aortic arch and aortic root sinus in ApoE deficient atherosclerosis mice. ANGPTL4 also improved atherosclerotic plaque stability, which is characterized by decreased plaque necrosis, increased collagen content. Moreover, ANGPTL4 markedly reduced proinflammatory cytokine secretion and lipid contents in blood plasma.

Conclusion: Taken together, these results demonstrated that ANGPTL4 has an anti-inflammatory and atheroprotective effects, to stabilize vulnerable atherosclerotic plaques.

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**MP04-5**

**STATINS AND THE PROGRESSION OF CORONARY ARTERY CALCIFICATION IN CKD: FROM THE KNOW-CKD STUDY**

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**Objectives**: Statins reduce the risk of CVDs (cardiovascular diseases). Paradoxically, previous studies have shown that the use of statins is associated with the progression CAC (coronary artery calcification), a well-known predictor of CVD, in individuals with preserved renal function or in patients on dialysis. However, little is known about the association in predialysis CKD (chronic kidney disease) patients. The aim of this study was to verify the relationship between statins use and the progression of CAC in a CKD cohort of Korean adults.

**Materials and Methods**: This study analyzed 719 participants from the KNOW-CKD cohort. The coronary artery calcium score (CACS) was assessed using cardiac computed tomography at baseline and 4 years after enrolment. The CAC progression was defined as the increase of CACS after 4 years.

**Results**: The study participants’ mean eGFR was 62.5±29.3 ml/min/1.73m². Their median CACS was 0 (0-30.33) and 318 (44.2%) participants had CACS above 0 at baseline. There were 341 (47.3%) statins users and 378 (52.6%) statins non-users. After 4 years, 374 (52.0%) patients had CAC progression. CAC progression was significantly higher in statin users than in statin non-users (218[58.3%] vs 156[41.7%], P<0.001). The multivariate-adjusted odds ratio for CAC progression in statins users compared to statins non-users was 1.50 (95% CI, 1.01-2.22; P=0.046).

**Conclusion**: Statins use was significantly and independently associated with CAC progression in Korean predialysis CKD patients. Further research is warranted to verify the prognosis of this statins-related CAC progression.

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**MP04-6**

**Efficacy and Safety of a Novel Lipid-Lowering Agent Pemafibrate in Japanese Patients with Type 2 Diabetes and Dyslipidemia**

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**Objectives**: Many patients with type 2 diabetes mellitus have dyslipidemia (hypercholesterolemia and/or hypertriglycerideremia). Conventionally, statins in combination with fibers have been relatively contraindicated in patients with abnormal renal function and are carefully administered to type 2 diabetic patients with both hypercholesterolemia and hypertriglycerideremia who were already receiving statins. The aim of this study is to evaluate the efficacy and safety of pemafibrate (PFB) in Japanese patients with type 2 diabetes and hypertriglycerideremia and/or hypercholesterolemia.

**Materials and Methods**: Twenty-four Japanese patients with type 2 diabetes mellitus were divided into two groups: A) 0.1 mg/day PFB in combination with pitavastatin 1, 2, or 4 mg/day for 12 weeks in 13 patients (combination therapy group); B) Monoadministration of 0.1 mg/day PFB for 12 weeks in 11 patients. Blood samples were collected before and after the administration of PFB to measure the serum levels of biochemical parameters (monotherapy group).

**Results**: We found a reduction in postprandial triglyceride level by 34% in the combination therapy group, which was significant compared to the monotherapy group (28% reduction). In 24 patients who received PFB with and without statins, significant improvement was seen in serum level of y-GTP (from 53 ± 40 to 38 ± 22 U/L), ALP (from 192 ± 49 to 164 ± 67 U/L), HDL cholesterol (from 51 ± 12 to 56 ± 13 mg/dL), LDL cholesterol/HDL cholesterol ratio (from 2.36 ± 0.59 to 2.07 ± 0.63), atherosclerosis index (AI) (from 3.05 ± 0.80 to 2.55 ± 0.82), and non-HDL cholesterol (from 149 ± 32 to 135 ± 28 mg/dL).

**Conclusion**: These results suggest that PFB administration improved serum lipids and parameters of hepatic function, and may have beneficial effects on atherosclerosis in Japanese patients with type 2 diabetes mellitus.

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Coronary Heart Disease

**MP05-1**

ASSOCIATION BETWEEN DENTAL HEALTH AND OBSTRUCTIVE CORONARY ARTERY DISEASE: AN OBSERVATIONAL STUDY

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**Objectives**: The association between dental health and coronary artery disease (CAD) remains a topic of debate. This study aimed to investigate the association between dental health and obstructive CAD using multiple dental indices.

**Materials and Methods**: Eighty-eight patients (mean age: 65 years, 86% male) were prospectively enrolled before undergoing coronary CT angiography (n=52) or invasive coronary angiography (n=36). Obstructive CAD was defined as luminal stenosis of ≥50% for the left main coronary artery or ≥70% for the other epicardial coronary arteries. All patients underwent thorough dental examinations to evaluate 7 dental health indices, including the sum of decayed and filled teeth, the ratio of no restoration, the community periodontal index of treatment needs, clinical attachment loss, the total dental index, the panoramic topography index, and number of lost teeth.

**Results**: Forty patients (45.4%) had obstructive CAD. Among the 7 dental health indices, only the number of lost teeth was significantly associated with obstructive CAD, with patients who had obstructive CAD having significantly more lost teeth than patients without obstructive CAD (13.08±10.4 vs. 5.44±5.74, p<0.001). The number of lost teeth was correlated with the number of obstructed coronary arteries (p<0.001). Multiple binary logistic regression analysis revealed that having ≥10 lost teeth was independently associated with the presence of obstructive CAD (odds ratio: 8.02, 95% confidence interval: 1.80–35.64; p=0.006).

**Conclusion**: Tooth loss was associated with the presence of obstructive CAD in patients undergoing coronary evaluation. Larger longitudinal studies are needed to determine whether there is a causal relationship between tooth loss and CAD.

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**MP05-2**

Withdrawal
**MP05-3**

ASSOCIATION OF β-ADRENERGIC RECEPTOR GENES POLYMORPHISMS WITH CORONARY ARTERY DISEASE

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Objectives: CAD is a major cardiac disease in humans. Many CAD patients develop left ventricle dysfunction (LVD), leading to congestive heart failure. Chronic β1AR activation is implicated in the pathogenesis of heart failure (HF) involving dysfunction of left ventricle and β-AR blockade improves survival. Common functional polymorphisms in β adrenergic receptor genes (ADRB3) have been associated with HF phenotypes. Therefore, the purpose of the present study was to explore the association of genetic variants in ADRB3 C190T (rs4994) and ADR2A C-1291G (rs1800544) with CAD and LVD.

Materials and Methods: The present study included 600 consecutive patients with angiographically confirmed CAD and 200 population matched controls. Among CAD patients, 189 with reduced left ventricle ejection fraction (LVEF≤45%) were categorized as LVD. The ADRB3 T-190C and ADR2A C-1291G polymorphisms were determined by PCR-RFLP.

Results: Our results showed that carrier status of ADRB3 T-190C (TC genotype and C allele) was significantly associated with increased risk of CAD in a dominant model (p-value=0.012, OR=1.64) but not with LVD. The ADR2A C-1291G polymorphism was not found to be risk for CAD (p-value=0.074, OR=1.40) and LVD (p-value=0.522, OR=0.87) when compared to controls.

Conclusion: ADRB3 C-190T plays an important role in conferring susceptibility of CAD, not LVD.

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**MP05-4**

IKKε DEFICIENCY AGGRAVATES CARDIAC INFLAMMATION WITH DYSREGULATION OF P52 AND P38 IN MYOCARDIAL INFARCTION

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Objectives: Inhibitor of NF-κB kinase (IKK), an upstream of nuclear factor-kappa B (NF-kB), is a critical modulator for pathophysiological inflammation. IKKs is a non-classical IKK and has been studied in infectious diseases and cancers. However, the role of IKKε in a myocardial infarction (MI) has not been addressed.

Materials and Methods: We used IKKε knockout (KO) mice to induce MI by coronary artery ligation. Phosphorylated protein array was performed in bone marrow-derived macrophages (BMDM). Cardiac macrophages isolated from infarcted heart tissue were measured inflammatory markers by FACS. Non-canonical NF-kB2 (p52) expression and localization in infarcted heart tissue were evaluated by western blotting, PCR and immuno histochemical analysis

Results: Fractional shortening was 16.36±4.46% in the wild type group and 13.47±1.21% in the IKKε KO group. We found that the expression of iNOS, an inflammatory marker, was much higher in both infarcted heart tissues and BMDM isolated from IKKε KO mice than from wild type (WT) mice. Besides, cardiac macrophages displayed more inflammatory phenotype in the IKKε KO group than in the WT group. To explore the responsible mediator, we performed phosphorylated protein array and found phosphorylated p38 was significantly downregulated in the IKKε KO BMDM. Conversely, both knockdown of p38 by siRNA and inhibition of p38 by SB203580 treatment in RAW264.7 cells upregulated iNOS induction. In the infarcted heart tissue, p52 protein was dramatically upregulated in the IKKε KO group than in the WT group, while mRNA level was not different in the both groups. Immunohistochemical analysis showed nuclear accumulation of p52 in cardiomyocytes and fibroblasts in the peri-infarct lesion.

Conclusion: Our data showed excessive inflammation in IKKε knockout mice was associated with inactivation of p38 in macrophages and upregulated p52 in the infarcted myocardium. Collectively, IKKε is involved in the control of inflammation resolution through modulating p38 activity and p52 post-translational modification in the infarcted myocardium.

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MP05-5

DOSE-DEPENDENT INHIBITORY EFFECT OF ROSUVASTATIN IN JAPANESE PATIENTS WITH ACUTE MYOCARDIAL INFARCTION ON SERUM CONCENTRATION OF MATRIX METALLOPROTEINASES – INVITATION TRIAL –

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Objectives: The matrix metalloproteinases (MMPs) have been shown to play a critical role in adverse cardiac remodeling for acute myocardial infarction (AMI). Some studies reported statins inhibit the increased MMPs levels after AMI. However, there are a few comparison studies between different dosages of the same statin and circulating levels of MMPs. This study was designed to determine the potential effects of appropriate or low dose of rosuvastatin on MMPs levels in patients with AMI.

Materials and Methods: This study was a multicenter, open label, 1:1 randomized, parallel group study to compare the appropriate or low dose of rosuvastatin in the effect on serum levels of MMPs in patients with AMI. 120 AMI patients undergoing percutaneous coronary intervention (PCI) within 48 hours from onset were randomly assigned to receive either appropriate or low-dose rosuvastatin daily within 24 hours after PCI. The low-dose group was treated with rosuvastatin 2.5 mg once daily with a follow-up. The appropriate-dose group was begun treatment with rosuvastatin 5 mg once daily, and uptitrated to 10 mg within 4 weeks. The primary endpoint was the change of MMPs up to 24 weeks after enrollment.

Results: Baseline characteristics were comparable between two groups. Although MMP-2 level was not different in each visiting point between two groups, the increased active/total ratio of MMP-9 from baseline was significantly inhibited in the appropriate-dose group compared with the low-dose group at 4 and 12 weeks after enrollment (4 weeks: 0.84 [0.38-1.58] vs 1.68 [0.71-2.79], P=0.02; 12 weeks: 0.84 [0.41-1.54] vs 1.68 [0.84-3.10], P=0.005).

Conclusion: The appropriate-dose rosuvastatin successfully inhibited active/total MMP-9 change at 4 and 12 weeks from baseline compared with the low dose group. This study could provide significant information that the higher dose of rosuvastatin has an anti-inflammatory property to prevent rupture for AMI.

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MP05-6

RISK FACTORS PROFILE FOR CORONARY ARTERY DISEASE AMONG INDONESIAN PEOPLE; A DESCRIPTIVE RETROSPECTIVE APPROACH

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Background: Coronary artery disease (CAD) is a worldwide health epidemic. Acute coronary syndrome is a potentially life-threatening condition and accountable for 31% global death per year

Objective: The aim of this study was to determine the conventional and modifiable risk factors of CAD in young and elderly aged patient in Indonesian people.

Materials and Methods: Methods: this study is descriptive retrospective study with consecutive sampling based on medical record data of patient who undergo coronary angiography from January 2018 until December 2018 in Awal Bros Hospital Tangerang Indonesia.

Results: Result: Total of 950 CAD Patient admitted to Awal Bros Hospital were selected for study. In this 250 patient were aged between 26-45 years and 700 patient >45 years of age. These patients were evaluated for risk factors contributing to occurrence of CAD. The result are: Hypertension (20%), Smoking (22%), Diabetes Mellitus (11%), and dyslipidemia (8%) were the most common risk factors in young patients. Overall risk factors were more likely in males compared to females (18 to <45 years, 79%; ≥65 years, 69.1%). With reference to elderly patients, the diabetes mellitus (21%), hypertension (14%), smoker (17%), kidney disease (11%) and dyslipidemia (9%) were the most common risk factors.

Conclusion: Conclusion: Young patients had a different risk-factor profile when compared with older patients. Hypertension and smoking were the most common risk factors in young patients of CAD, whereas diabetes mellitus, kidney disease, and smoking were found in elderly patients.

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Cerebrovascular Disease / Renovascular Disease

**MP06-1**

**VISCERAL FAT AND CLINICAL OUTCOME AFTER ACUTE ISCHEMIC STROKE**

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**Objectives:** This study aims to investigate the association between visceral fat and outcome in acute ischemic stroke (AIS) patients treated with intravenous thrombolysis (IVT). Additionally, we evaluate whether a true obesity paradox exists in patients with AIS.

**Materials and Methods:** A total of 127 patients with AIS treated with IVT who underwent abdominal computed tomography on admission were enrolled in this cohort study. Patients were grouped according to the visceral fat proportion tertile. The primary outcome was measured using the modified Rankin Scale (mRS) three months after symptom onset. Favorable and excellent outcomes were defined as mRS scores of 0-2 and 0-1, respectively. Secondary outcomes included early clinical outcome parameters and intracranial hemorrhage.

**Results:** With increasing visceral fat proportion tertile, the number of patients exhibiting a favorable or excellent outcome significantly decreased. There were no significant differences in secondary outcomes among visceral fat proportion tertiles. In the final multivariable analysis after adjustments for confounders, patients in the highest visceral fat proportion tertile showed a decreased probability of a favorable or excellent outcome compared with those in the lowest tertile. Obese patients only seemingly have a better outcome because this effect mainly relies on a subgroup with a low visceral fat proportion.

**Conclusion:** These data indicate that low visceral fat is associated with a favorable outcome in AIS patients treated with IVT. The obesity paradox seems to be caused by a low visceral fat proportion in patients with a high body mass index. Thus, a reduction of visceral fat, not weight gain, as implied by the obesity paradox, may contribute to a favorable outcome after AIS.

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**MP06-2**

**THE EFFECT OF PROBIOTIC ORANGE FRUIT WATER KEFIR ON MALONDIALDEHYDE (MDA) LEVEL AND SUPEROXIDE DISMUTASE (SOD) ACTIVITY IN BRAIN OF HYPERLIPIDEMIA RATS MODEL**

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**Objectives:** Oxidative stress in hyperlipidemia has negative impact on central nervous system (CNS) and blood-brain barrier. Some studies have shown that probiotics can decrease MDA levels and increase SOD activity including in the brain organ. This research aims to know the effect of probiotic orange fruit water kefir on MDA levels and SOD activity in the brain of hyperlipidemia rats model.

**Materials and Methods:** The sample of this research was 15 male rats (*Rattus norvegicus*) aged 2-3 months and weighs 200-300 grams divided into 3 groups (K+, K−, and B). The positive control group (K+) and interfered group (B) were given quail eggs yolk for 4 weeks with a dose of 5 ml/200 gBW to make hyperlipidemia rats model. The negative control group (K−) was not given quail eggs yolk. For the next 4 weeks, B group was given probiotic orange fruit water kefir. All of this intervention was administered to rats with sonde method. At the end of the research, the rats were terminated. ANOVA with Bonferroni post-hoc test was used in statistical analyzing.

**Results:** Mean of MDA levels (nmol/g) were 9.33 ± 0.18 for positive control group (K+); 1.16 ± 0.12 for negative control group (K−), and 3.25 ± 0.17 for interfered group (B). SOD activity (%) were 26.43 ± 1.90 for positive control group (K+); 75.36 ± 3.31 for negative control group (K−), and 69.64 ± 2.19 for interfered group (B). One way ANOVA test and Bonferroni post-hoc test showed significant differences in MDA level among K+ and B group after given probiotic orange fruit water kefir (p<0.05). In addition, there is no significant differences in SOD activity among K− and B group (p>0.05).

**Conclusion:** The intervention of probiotic orange fruit water kefir significantly decrease MDA level and increased SOD activity in brain of hyperlipidemia rats model.

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DO STROKE WOMEN AND MEN HAD DIFFERENCES TYPE OF CARDIOVASCULAR DISEASE RISK FACTORS? RESULTS FROM FIVE-YEAR OBSERVATION FROM ONE STROKE REGISTRY IN THAILAND

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Objectives: Sex differences in cardiovascular disease and stroke has long been explored globally, but not in Asian and Thai countries. We examined whether women and men with acute ischemic stroke had differences type of major cardiovascular disease risk factors.

Materials and Methods: We obtained secondary data analysis from the stroke registry of a tertiary care, teaching, and referral hospital located in the South of Thailand. There were 3,135 patients with acute ischemic stroke admitted during October 2011 to February 2016. There were 1,260(40.28%) women, and 1,875(59.72%) men. A total of 10 cardiovascular risk factors are defined. Six were identified based on the Essen Stroke Risk Score (ESRS) included of hypertension, diabetes, previous myocardial infarction (MI), peripheral arterial disease (PAD), other cardiovascular diseases (CVD) except MI and atrial fibrillation (AF), and previous stroke/TIA. Other four included of AF, hypercholesterolemia, smoking, and alcohol drinking.

Results: Women were five years older than men (66.25±14.71 vs 61.94±13.55, p=0.000). There was a higher number of older adult women than men (57.9 vs 41.7%; p=0.000), with an odds ratio of 1.47(95%CI 1.35-1.61). Compared to men, women were more likely had higher rates of hypertension (65.2 vs 55.0%; OR 1.29[95%CI 1.18-1.42]), diabetes (30.1 vs 19.9%; OR 1.36[95%CI 1.25-1.49]), MI (0.2 vs 0.1%; OR 1.87[95%CI 1.06-3.29]), and hypercholesterolemia (30.1 vs 19.9%; OR 1.33[95%CI 1.22-1.45]). Women had lower rates of smoking (10.2 vs 0.1%; OR 1.87[95%CI 1.06-3.29]), and alcohol drinking (4.4 vs 63.4%; OR 0.07[95%CI 0.05-0.09]), compared to men. Prevalence of atrial fibrillation, peripheral arterial disease, and previous stroke/TIA among women and men were not significantly differences.

Conclusion: Women and men had 6 differences and 4 similar CVD risk factors. To prevention recurrent stroke in women, we would be considered in blood pressure control, clinical management of diabetes and MI, and lipid lowering. Quite smoking, and appropriate alcohol drinking would be considered in stroke men.

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ASSOCIATION OF HYPERGLYCEMIA DURING ACUTE EPISODE ISCHEMIC STROKE ON SHORT-TERM FUNCTIONAL RECOVERY OF NON-DIABETIC STROKES

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Objectives: We examined the association of hyperglycemia on a short-term functional recovery in acute ischemic stroke with non-diabetes. Hyperglycemia is associated with poor outcomes after acute stroke. Some studies have demonstrated that hyperglycemia contributes to brain damage through different mechanisms: increasing blood brain barrier permeability, provoking cerebral edema, and promoting release of inflammatory mediators. An additional mechanism of injury included ischemia, mediated by vasconstriction and microcirculation thrombosis. Many investigators point-out that this is not a benign condition and that stress-induced hyperglycemia is associated with a high mortality after stroke, and poor functional recovery.

Materials and Methods: All patients with acute ischemic stroke (N = 3,135) admitted to a tertiary care, teaching, and referral hospital the south of Thailand, from October, 2011 to February, 2016, were reviewed. There were 2,336 non-previous diabetes, and 2,334 cases were eligible. Hyperglycemia was defined as fasting blood glucose >120 mg/dL (>6.7 mmol/l). Functional outcome was assessed by using modified Rankin Scale (mRS) at discharge and one-month follow-up. Scores of 3 or above indicated poor functional outcome. Independent t-test, Chi-square, and odds ratio (95%CI) were employed.

Results: There were 894 strokes (38.3%) with hyperglycemia. Rates of poor functional recovery were 34.4% at discharge, and 19.4% at one-month follow-up. Compared with non-hyperglycemic, strokes with hyperglycemia had higher rates of poor function recovery at discharge (43.8% vs 35.4%, Wald 15.43, OR 1.41, 95%CI 1.19-1.69, p=0.000), and at one-month follow-up (41.3% vs 34.3%, Wald 4.20, OR 1.27, 95%CI 1.01-1.59, p=0.040). Strokes with hyperglycemia were more likely had higher score on mRS at discharge (2.08±1.88 vs 1.65±1.74, t=5.53, p=0.000), and at one-month follow-up (1.20±1.37 vs 0.96±1.13, t=2.99, p=0.003).

Conclusion: Non-diabetic strokes with hyperglycemia had poor functional recovery during short-term periods at discharge and one-month follow-up. This findings warrant further research explored the impact of hyperglycemia and other metabolic risk factors to predict short-and long-term functional outcomes.

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**MP06-5**

**TREATMENT OF BONE MARROW-DERIVED STEM CELL PREVENTS RENAL DISEASE PROGRESSION IN IL-10 KNOCK OUT MICE**

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**Objectives**: Here, we analyze the role of BMSCs in reducing the progression of kidney fibrosis.

**Materials and Methods**: Progressive renal damage was achieved by bilateral ischemia induced in C57BL6/N male mice for 35 min; after that, the kidney was reperfused immediately. Four hours after the surgery, 5 × 10(5) BMSCs were injected via tail vein, and mice were followed for 24 h posttreatment and then at some other time interval for the next 2 days. Also, animals were treated with 5 × 10(5) BMSCs for 2 times after reperfusion and sacrificed 7 days later to study their effect when interstitial fibrosis is already present.

**Results**: Treatment of bone marrow-derived stem cell prevents renal disease progression in IL-10 Knock out mice.

**Conclusion**: At 24 h after reperfusion, BMSCs-treated mice showed reduced renal dysfunction and enhanced regenerative tubular processes. Expression of IL-6 and TNF proteins decreased in BMSCs-treated animals, while antioxidant proteins such as catalase and SOD expression were increased in the kidney despite IL-10 deficiency in the kidneys as determined by western blot analysis. As expected, untreated kidneys shrank at 7 days, whereas the kidneys of BMSC-treated animals remained normal in size, showed less tubular damage, collagen deposition, and decreased staining for α-smooth muscle actin (α-SMA) and type I collagen. Surprisingly, treatment with BMSCs at 7 days, when animals already showed installed fibrosis, demonstrated amelioration of functional parameters and oxidative stress (superoxide, hydrogen peroxide and lipid peroxidation) with less tissue fibrosis observed and reduced protein expression of type I collagen and α-SMA. BMSC therapy can improve functional parameters and reduce progression of renal injury at early and later times after injury, mostly due to early modulation of the inflammatory response and to less oxidative stress, thereby reducing the epithelial-mesenchymal transition.

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**MP06-6**

**ANTICOAGULATION AND INR STABILITY: ARE THEY RELATED TO INDIVIDUALS GENETIC PROFILING? A CORRELATION OF INR STABILITY AND CLINICAL PARAMETERS IN PATIENTS**

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**Objectives**: To analyze the clinical importance of gene polymorphism and its correlation with stability of oral anticoagulation drugs in patients with cardiac and neurological complications.

**Materials and Methods**: The study was performed in a tertiary care research institute, where the patients on oral anticoagulant drugs (OAC) were included attending the outdoor and admitted in the ward. They received OAC for cardioembolic stroke, cerebral venous sinus thrombosis (CVST), and prevention of deep vein thrombosis (DVT). Demographic, clinical and neurological findings were noted precisely. Stability of anticoagulation was determined by percentage of time international normalized ratio (INR) values were in therapeutic range. Time in therapeutic range (TTR) >65% was defined as stable and <65% as unstable. VKORC1 polymorphism was studied by polymerase chain reaction and correlated with daily dose of OAC and stability of INR.

**Results**: We enrolled total 157 patients with a median age of 40 years were included in the study. Ninety-two patients received OAC for secondary stroke prevention, 62 for CVST, and 3 for DVT. Out of 2976 INR reports, 1458 (49%) were in the therapeutic range, 997 (33.1%) were below the therapeutic range, and 521 (17.5%) were above the therapeutic level. Stable INR was obtained in 75 (47.77%) patients which was improved by drug modification in 3 and dietary adjustment in 12 patients. VKORC1 polymorphism revealed GG genotype in 127 (80.9%), GA genotype in 22 (14%), and AA genotype in 8 (5.1%) patients. Therapeutic range of INR was seen in 49%, below therapeutic range was seen in 31.5%, and above in 17.5%.

**Conclusion**: It can be concluded that the mean daily dose of oral anticoagulant drugs was related to genetic polymorphism of VKORC1 whereas stability could not provide very satisfying results and more genes determining the factors affecting INR stability are to be studied for some useful conclusion to benefit the patients on the OAC drugs.

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**Cardiometabolic Risk Factors and Biomarkers in Atherosclerosis**

**MP07-1**

**BILE ACIDS AGGRAVATE NON-ALCOHOLIC STEATOHEPATITIS AND CARDIOVASCULAR DISEASE IN SHRSP5/DMCR**

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**Objectives**: Nonalcoholic steatohepatitis (NASH) increases cardiovascular risk, regardless of metabolic syndrome risk factors. However, the intermediate factors linking NASH and cardiovascular disease are still unknown. We established a novel disease model in SHRSP5/DMcr rats, in which rats were fed with a high-fat and high-cholesterol (HFC) diet and L-NAME, a NO synthase inhibitor, that simultaneously presents with NASH and myocardial infarction (MI). It is well known that in NASH patients, there is an increase in the level of bile acids (BAs), which is related to a high degree of cytotoxicity. We investigated whether BAs aggravate cardiovascular disease in SHRSP5/DMcr rat.

**Materials and Methods**: SHRSP5/DMcr rats were divided into 3 groups. The animals’ feeding consisted of an HFC diet that included 0%, 2%, or 4% cholic acid (CA). After 6 weeks of HFC diet feeding, L-NAME had been administered intraperitoneally to rats. After 8 weeks of HFC diet feeding, echocardiography, blood biochemistry, and histopathological staining were evaluated.

**Results**: 4% CA group demonstrated severe hepatic steatosis, fibrosis, and hypertrophy. The hepatic fibrosis and hypertrophy improved in the 0% CA group. The serum level of BAs was considerably higher in the 4% CA group than in the 0% CA group. There was diffuse lipid deposition in the abdominal artery. Additionally, the coronary arteries were also stenosed in the 4% CA group. The 4% CA group demonstrated extensive myocardial fibrosis and severe left ventricular (LV) systolic dysfunction. Differently, lipid deposition in the abdominal and coronary arteries diminished in the 0% CA group. The animals in this group also demonstrated no myocardial fibrosis and LV systolic dysfunction.

**Conclusion**: NASH and cardiovascular disease may be mediated by BA excess with a high degree of cytotoxicity.

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**MP07-2**

**THE ASSOCIATION BETWEEN PROTEINURIA AND CAROTID ARTERY ATHEROSCLEROSIS IN NON-ALBUMINURIC TYPE 2 DIABETIC PATIENTS**

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**Objectives**: In type 2 diabetes patients (T2D), specific urinary proteins other than albumin which reflect tubular damage were known to be associated with parameters related to blood glucose and vascular complications. We evaluated the association between proteinuria and carotid artery atherosclerosis (CAA) in T2D patients without albuminuria.

**Materials and Methods**: We retrospectively recruited patients with T2D without albuminuria, defined as urinary albumin-to-creatinine ratio (uACR) < 30 mg/g. And then, the subjects were divided to non-proteinuria (NP) group and non-albuminuric proteinuria (NAP) group, based on the urine protein-to-creatinine ratio (uPCR, 150 mg/g). Measurement of carotid artery intima media thickness (IMT) and blood tests performed on the same day as the urine test were used for our analyses. Mean carotid IMT was compared between two groups, and logistic regression analyses were conducted to evaluate predictive power of proteinuria for increased carotid IMT.

**Results**: 2096 non-albuminuric T2D patients were recruited, and 192 patients were classified into NAP group. Mean carotid IMT of NAP group was thicker than NP group (0.72 ± 0.16 vs. 0.70 ± 0.14 mm, p=0.034). In logistic regression analysis, the presence of proteinuria predicted abnormally increased carotid IMT, defined as ≥ 1mm, after adjustment for conventional risk factors including age, sex, body mass index (BMI), fasting glucose, total cholesterol, serum alanine aminotransferase (ALT), and serum creatinine (odds ratio (OR) = 2.342, 95% confidence interval 1.082-5.070, p=0.030, area under curve (AUC) of the multivariable model = 0.791, p<0.001).

**Conclusion**: In non-albuminuric T2D patients, overt proteinuria was associated with significantly increased carotid IMT. Confirming uPCR as well as uACR might be more helpful for predicting CAA in T2D patients.

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ROLE OF FATTY ACID OXIDATION IN HEART FUNCTION

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Objectives: The role of fatty acid (FA) oxidation in myocyte health has long been debated. More than 70% of the energy production in myocardial cells depends on FA oxidation, but excessive FA oxidation has been considered a cause of cardiac dysfunction due to increased heart oxygen consumption. Inhibition of cardiac FA oxidation to prevent myocardial infarction has been tested in animal models and human subjects, but it is still unclear. Malonyl-CoA is a natural inhibitor of mitochondrial FA oxidation and can be a natural target to control the induction of heart attack. Here, we generated myocyte-specific ACC1 and 2 knockout mice to investigate the role of FA oxidation in cardiac function.

Materials and Methods: ACC1 and ACC2 heart-specific double knockout mice were generated by crossing ACC1 and ACC2 floxed mice with Myh6-CRE transgenic mice. Cardiac function was measured by ECHO. Cardiac FA oxidation was measured by Langendorff perfusion. Oxfencine or Etomoxir was administrated via IP or dietary mixture to inhibit FA oxidation. LC/MS was used to measure FA composition and cardiolipin levels.

Results: ACC KO mice developed a dilated cardiomyopathy at 7-8 weeks, which progressed with age. Perfusion studies demonstrated that the hearts from ACC mice exhibit increased FA oxidation. Analysis of heart FA composition revealed and marked reduction in linoleic acid leading to a severe deficiency of cardiolipin. Blocking FA oxidation using Oxdefencine normalized levels of linoleic acid in the heart and prevented the development of the dilated cardiomyopathy.

Conclusion: The unrestrained FA oxidation that results from the deletion of ACCs in heart led to the development of a dilated cardiomyopathy. The cardiomyopathy could be prevented by the administration of drugs that block FA oxidation. This study provides clear evidence of the direct relevance of heart failure and excessive mitochondrial FA oxidation as well as the application of FA oxidation inhibition in heart failure.

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COMPARISON OF ATHEROSCLEROSIS INDICES AND TRIGLYCERIDE GLUCOSE INDEX IN HYPERTENSIVE AND NORMOTENSIVE COMMUNITY DWELLING INDIVIDUALS, A CASE CONTROL STUDY

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Objectives: Hypertension is the most important risk factor for cardiovascular diseases. High blood pressure is a major cause of atherosclerosis which leads to heart attacks and strokes. Insulin Resistance (IR) is correlated with hypertension and atherosclerosis. To find out the difference between the effect of hypertension on internal, external and common carotid arteries’ intima media thickness (ICA, ECA and CCA IMT respectively), and evaluating the carotid plaque presence between hypertensive and normotensive individuals, a case control study was designed on community dwelling individuals. Relationship between Triglyceride Glucose (TyG) Index (a marker of IR) and atherosclerosis also sought in this study.

Materials and Methods: Data of 276 individuals, consist of 77 hypertensive and 199 normotensive individuals analyzed in this study. An individuals was categorized in hypertensive case group if he or she has confirmed hypertension or used hypertensive medication. Carotid IMT was evaluated using B Mode carotid ultrasound and Tyg index was calculated by this formula: Ln (fasting triglyceride level*fasting blood sugar level/2).

Results: The IMT of CCA, ICA and ECA and TyG index are higher in the hypertensive individuals compared to the control group (all p values<0.05). After controlling for age, gender, BMI and TyG index, hypertension is the independent predictor of high CCA IMT (OR=2.48 CI=1.24-4.93) and plaque presence (OR=2.36 CI=1.15-4.85) in the carotid artery. Hypertension is an independent risk of early and late stage subclinical atherosclerosis. Although TyG index was significantly associated with carotid IMT and carotid plaque score (all p values<0.05), it only can predict CCA IMT independent of other risk factors (OR=2.09 CI=1.07-4.09).

Conclusion: Effects of hypertension on IMT and odds of plaque presence in the community dwelling individuals can be explained by “response to injury” hypothesis of plaque formation in carotid artery. TyG index can be used to evaluate atherosclerosis in community dwelling individuals.

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CORRELATION OF WAIST CIRCUMFERENCE CUT OFF WITH PARAMETERS OF METABOLIC SYNDROME IN OVERWEIGHT AND OBESE SCHOOLCHILDREN

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Objectives: This study was designed to correlate various metabolic syndrome parameters in obese and overweight children based on two Indian waist circumference cut-offs, 70 and 90 percentile respectively.

Materials and Methods: 1958 children from four schools of Northern India were screened for this study. Anthropometric measurements (weight, height and waist circumference) and blood pressure were taken by standard methods. Fasting venous blood sample was taken for insulin, blood sugar, triglyceride, LDL and HDL cholesterol. Metabolic syndrome was defined as per International Diabetic Federation (IDF) criteria. Insulin resistance was calculated by HOMA-IR.

Results: Among the screened overweight and obese children with IDF definition, the prevalence of metabolic syndrome was 29% whereas with lower cut off 70th centile of waist circumference 50% children were diagnosed to have MS. When children with WC between 70th to 90th centile were compared with those >90th centile higher proportion of hypertension, hypertriglyceridemia and increased metabolic risk (> 2 parameters) was observed in children with WC >90th centile (p<0.05).

Conclusion: Waist circumference is an important anthropometric variable to predict metabolic syndrome parameters in overweight and obese children.

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ASSOCIATION OF ADIPOGENETIC GENE POLYMORPHISM WITH METABOLIC SYNDROME, SERUM ADIPOGENETIN AND LEPTIN LEVELS IN PREMENOPAUSAL WOMEN OF NORTH INDIAN POPULATION

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Objectives: Adipose tissue is an important endocrine organ regulating whole-body metabolism and other vital functions related to inflammation and immune responses. It produced biologically active proteins termed “adipokines”, including Interleukin-6, Tumor necrosis factor-alpha, Resistin, Adiponectin and Leptin etc, which may contribute to the development of metabolic syndrome. We aimed to investigate the association of adiponectin gene polymorphism T45G & G276T in metabolic syndrome, Insulin resistance, serum adiponectin and Leptin levels of premenopausal women of north Indian population.

Materials and Methods: The Adiponectin T45G & G276T polymorphism has been studied in 305 females with Metabolic Syndrome and in 310 healthy females without Metabolic Syndrome according to NCEP ATP III criteria, 2001. Circulating Adiponectin and Leptin levels were determined by sandwich ELISA method and Insulin resistance by the homeostasis model assessment (HOMA) index. The polymorphism of Adiponectin 45 T/G and 276 G/T gene were analyzed by PCR-RFLP method

Results: Significant difference were obtained for high circulating leptin level, low circulating adiponectin levels and metabolic risk factors in premenopausal women. Homozygous mutant genotype (GG) (TT vs TG+GG) (p=0.0169: OR=1.55: 95% CI= 1.09-2.19) & mutant allele (G) (p=0.008: OR=1.49: 95% CI= 1.12-1.99) of the -T45G gene and mutant allele (T) (p=0.0278: OR=1.36: 95% CI= 1.04-1.77) of the G276T polymorphism were significantly high frequently observed in the study group. Furthermore, variant genotype and variant allele of Adiponectin gene showed significant effect on various components of metabolic syndrome.

Conclusion: The results of the present study concluded that the single nucleotide polymorphism of the adiponectin 45 T/G & 276 G/T gene might play a important role in obesity associated metabolic syndrome and metabolic abnormalities except insulin resistance, glucose level and insulin levels in the north Indian women due to mutation of the adiponectin gene is associated with decreased adiposity which is protective one for metabolic syndrome.

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GLYCATED HEMOGLOBIN LEVELS ARE ASSOCIATED WITH LOW SKELETAL MUSCLE MASS IN NON-DIABETIC WOMEN: A NATIONWIDE CROSS-SECTIONAL STUDY

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Objective: Diabetes mellitus has been reported to be associated with sarcopenia. However, the association between glycatef hemoglobin (HbA1c) levels and muscle mass in non-diabetic subjects has been relatively underinvestigated. The present study aimed to investigate the association between HbA1c levels and muscle mass using a nationally representative cohort in Korea.

Materials and Methods: This is a population-based, cross-sectional study from Korea National Health and Nutrition Examination Surveys, including 1,901 non-diabetic subjects (796 women and 1,105 men) aged 20 years or older. Sarcopenia was defined as an appendicular skeletal muscle mass (ASM) divided by body mass index (BMI) that was less than 1 SD below the sex-specific mean for young adults. All analyses were performed while considering sample weighting by using the Complex Samples Plan (CSPLAN).

Results: The prevalence of sarcopenia increased with the HbA1c tertile in women (22.5%, 34.4% and 48.3% in the 1st, 2nd, and 3rd HbA1c tertiles, respectively; p < 0.001). In the multivariate logistic regression analysis, the odds ratio (95% confidence interval) for sarcopenia was 1.70 (1.10-2.63) in the highest HbA1c tertile group in women. In men, neither the prevalence of sarcopenia nor the odds ratio significantly differed among the HbA1c tertile groups.

Conclusion: Elevated HbA1c levels are independently associated with sarcopenia in non-diabetic women.

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OXIDATIVE INSULT INDUCED SENESCENCE IN RETINAL PIGMENT EPITHELIAL CELLS: A KEY CONTRIBUTOR TO AGE-RELATED MACULAR DEGENERATION

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Objective: Oxidative damage to retinal pigmented epithelial (RPE) cells has been implicated in the pathogenesis of aged macular degeneration (AMD), which is known to cause irreversible central vision loss. A multifactorial disease that includes advanced age, smoking, obesity and low dietary intake of antioxidant as the main risk factors. Therefore, in this study, we sought to investigate the effects of hydrogen peroxide (H2O2) induced oxidative stress could elicit a senescence response in cultured RPE cells.

Materials and Methods: MTT assay was used to evaluate the cell viability of exposed human RPE cell line (ARPE-19) to variety H2O2 concentration (0-1000 μM) for 24 hours. Immunofluorescence and Western blot analysis were used to investigate tight junction, adherent junction and senescence marker. Senescence-associated-β-galactosidase (SA-β-Gal) assay used to detect galactosidase activity.

Results: Structural changes appearing in senescent cells causes changes in the shape and size of RPE cells insulted with H2O2. RPE cells integrity was determined by immunofluorescence analysis of tight junction protein zonula occulens-1 (ZO-1), revealed that expression of ZO-1 was dose-dependently inhibited with increasing concentration of H2O2. Additionally, the effect of oxidative stress on adherent junction was examined, disruption of the peripheral localization of N-cadherin has been observed and confirmed by western blot analysis. H2O2 oxidative insult was followed by senescence as shown by positive senescence associated-β-galactosidase (SA-β-Gal) staining, and p16 and p21 protein upregulation. Senescent cell upregulated the proinflammatory cytokine IL-6 and IL-8, the main markers of the senescence-associated secretory phenotype.

Conclusion: Our results support the hypothesis that H2O2 insult plays a role in the induction and progression of AMD. Moreover, they would also explain the striking association of AMD with age-associated functional losses due to accumulation of reactive oxygen and nitrogen species-induced damage along with lifestyle habit, cigarette smoking.

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THE ASSOCIATION BETWEEN FORCED EXPIRATORY VOLUME AND VISCERAL FAT AMONG STUDENTS

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Objectives: This study had the objective to detect the correlation of visceral fat and forced expiratory volume that affects an individual.

Materials and Methods: Cross-Sectional research was performed, by observing 13 students of Universitas Islam Indonesia (UII) Yogyakarta with a range of ages 18 to 21 years old. All students presented a BMI between 19 kg/m² and 29 kg/m² and none had a history of morbidity. The research assessed pulmonary function with spirometry and measured visceral fat with karada scan.

Results: The results demonstrated that visceral fat and FEV1 had a strong negative correlation with significant value 0.795 and Pearson correlation value -0.880.

Conclusion: The visceral fat and forced expiratory volume had a strong negative correlation value that shows FEV1 is decreased with an increased visceral fat value. We conclude that pulmonary function is influenced by visceral fat.

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ASSOCIATION OF ADIPOQ POLYMORPHISMS PEOPLE WITH METABOLIC SYNDROME

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Objectives : To determine the links between two polymorphisms of the ADIPOQ gene and plasma adiponectin level in individuals with metabolic syndrome.

Materials and Methods : In this study 160 subjects with metabolic syndrome and 144 subjects without metabolic syndrome were investigated. The metabolic syndrome was defined using the modified IDF criteria.

Results : SNP -11377>C>G was not significantly associated with MS (p=0.775). The CG/GG genotype frequencies in the MS and non MS groups were 48.7% and 50.7%, respectively. However SNP +45T>G was significantly related to MS (p=0.015). The TG/GG genotype frequencies in the MS and non MS groups were 55% and 41%, respectively. With genotype CG and GG (6.57±3.09ng/ml) of -11377>C>G had lower levels of serum adiponectin than those with the genotype CC (7.38±3.68ng/ml) but no significant difference in people with MS (p=0.157). Therefore with genotype CG and GG (168.56±113.31mg/dl) of -11377>C>G had higher levels of serum triglycerides than those with the genotype CC (132.94±74.78mg/dl), which was significantly different in people with MS (OR=1.006, p=0.015). With genotype TG and GG (30.29±10.37mg/dl) of +45T>G had significantly lower level of serum HDL-C than those with the genotype TT (34.18±12.39mg/dl) (p=0.032). MS group with genotype TG and GG (102.40±36.41mg/dl) of +45T>G had significantly higher level of serum LDL-C than those with the genotype TT (87.61±41.62mg/dl) (p=0.019).

Conclusion :  
1. SNP -11377>C>G wasn’t associated to metabolic syndrome (p=0.775). G allele of ADIPOQ +45T>G gene polymorphism was linked to influences susceptibility to metabolic syndrome (p=0.015).
2. Risk allele of +45T>G polymorphism of ADIPOQ gene is associated with increased level of serum cholesterol (OR=1.017, p=0.012), glucose (OR=1.039, p=0.003) and diastolic BP (OR=1.062, p=0.039) in people with metabolic syndrome. Risk allele of -11377>C>G polymorphism is associated with increased level of serum triglyceride in people with metabolic syndrome (OR=1.006, p=0.015).
3. Our data failed to detect any significant association between SNP -11377>C>G, +45T>G and adiponectin level (p>0.05).

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THE ROLE OF ABCA1 ON THE GLOMERULAR LIPID ACCUMULATION AND RENAL INJURY IN THE DIABETIC KIDNEY DISEASE

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Objectives : Glomerular lipid accumulation is one of the pathologic characteristics of diabetic kidney disease (DKD). Recent evidences suggested that ATP-binding cassette transporters A1 (ABCA1) has a particular effect on the cellular lipid homeostasis. We aimed to evaluate the role of ABCA1 on the lipid accumulation in glomeruli and podocyte under the diabetic conditions.

Materials and Methods : In vitro, mouse podocytes were stimulated with high glucose (HG) and palmitic acid (PA), and treated an GW683965, agonist of ABCA1. In vivo, C57BL/6 and ABCA1 knockout (KO) mice were maintained with high fat diet for 12 weeks with low dose streptozocin intraperitoneal injection. GW683965 was administered via osmotic pump in db/m or db/db mice. Urinary albumin-to-creatinine ratio (ACR), total cholesterol and triglyceride in kidney tissues were measured. RhoA activity and BODIPY 493/503 staining were performed in the kidney. Foot process effacement in glomeruli was evaluated by transmission electron microscopy. Apoptosis, mitochondrial morphology and energy metabolic key enzymes were evaluated both in vitro and vivo.

Results : Blood glucose, ACR, serum cholesterol and triglyceride were significantly increased and foot process effacement was prominent in diabetic mice. These changes were exaggerated in the ABCA1 KO mouse with diabetes, whereas abrogated by GW683965 treatment. Renal cholesterol and triglyceride contents were higher in ABCA1 KO mice with diabetes or lower in GW683965 treated mice than those in control and diabetic mice. Mitochondrial morphology and the expression of energy metabolic enzymes were changed in the kidneys of diabetic ABCA1 KO mice or GW683965 treated mice. In vitro, the intracellular lipid contents were increased and apoptosis combined with mitochondrial swelling and crista disruption were also increased in podocytes with HG and PA stimuli. All of these changes were ameliorated through GW683965 treatment.

Conclusion : These findings suggest that ABCA1 plays an important role in the glomerular lipid accumulation and renal injury under diabetic conditions.

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MP09-3

HUMAN RESISTIN INDUCES MITOCHONDRIAL DYSFUNCTION VIA CYCLASE-ASSOCIATED PROTEIN 1-MEDIATED FISSION

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Objectives: Obesity is implicated in a number of metabolic diseases including insulin resistant type 2 diabetes. One of the suggested mechanisms of insulin resistance is obesity-induced mitochondrial dysfunction. Resistin is known to mediate obesity-induced insulin resistance in mice, but this is not evident in humans. Here, we show that human resistin directly induces mitochondrial dysfunction via fission.

Materials and Methods: To confirm whether human resistin induces mitochondrial dysfunction, we measured oxygen consumption rate, ATP parameters, and electron transport chain activity after human resistin treatment. We also observed morphological changes of mitochondria by human resistin via immunocytochemistry, super-resolution microscopy and transmission electron microscopy. We generated CAP1 mutant constructs and knockout cell-line to verify whether CAP1 is important in human resistin-induced mitochondrial fission. Western blot analysis was also performed to investigate downstream signaling of human resistin-CAP1 axis to mediate mitochondrial fission.

Results: Here, we show that human resistin impairs mitochondrial homeostasis by inducing mitochondrial fission, leading to a decrease in ATP production and mitochondrial dysfunction. Induction of mitochondrial fission by human resistin is accompanied by increased formation of mitochondria-associated ER membranes. The key molecule that mediates human resistin-induced mitochondrial fission is adenylyl cyclase-associated protein 1 (CAP1), which we previously reported as a bona fide receptor for human resistin.

Conclusion: Our study suggests that the resistin-CAP1 complex could be a potential therapeutic target for the treatment of obesity-related metabolic diseases.

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MP09-4

STANDARDIZATION AND EFFICACY OF POLYHERBAL FORMULATION ON LIPID PROFILE IN TYPE 2 DIABETES MELLITUS (T2DM) PATIENTS

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Objectives: To assess the efficacy of a polyherbal formulation on lipid profile and other biochemical parameters such as glucose level HbA1C LFT KFT and hypoglycaemic activity of the formulation in T2DM patients

Materials and Methods: Six individual herbs of Berberis aristata, Cedrus deodara, Cyperus rotundus, Emblica officinalis, Terminalia chebula and Terminalia berriica were used for making PHF Newly diagnosed T2DM patients as per ADA diagnostic criteria and screened for inclusion and exclusion criteria. Total of 194 patients were randomly allocated to PHF with metformin group (n=98) and metformin only treatment group (n=96). Initially 1 gm of the PHF and 500 mg of Metformin was chosen as starting dose which was increased to 3 gm per day for PHF. After a follow-up period of 6 months the results were analysed.

Results: A significant reduction in total cholesterol, p-value <0.0001; triglyceride, p-value <0.0001; LDL – cholesterol, p-value 0.008 and VLDL - cholesterol, p-value 0.016 was observed in PHF with metformin group in comparison to metformin only treatment group. Fasting and Post prandial blood glucose level decreased in both the groups but the % reduction in FBG was greater in group 2 with metformin (31.46 %) than group 1 with PHF (25.52%) No significant difference was observed with liver enzymes and bilirubin between the 2 groups in LFT.

Conclusion: Polyherbal formulation can effectively correct lipid profile in T2DM patients, reduces FPG as effectively as metformin, reduction in PPG is greater in PHF as compared to metformin, glycemic profile was significantly improved after 6 months of treatment with PHF and its efficacy is comparable to metformin, no risk of hypoglycaemia is reported with PHF and Metformin.

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Metabolic syndrome was defined based on the International Diabetes Federation criteria in all the included studies. High level of results:

People with metabolic syndrome in western India have a high incidence of endothelial dysfunction, although its incidence in the control group is equally disturbing.

Withdrawal

Withdrawal
**Epidemiology**

**MP10-1**

**ASSOCIATION BETWEEN DYSLIPIDEMIA AND DRY EYE SYNDROME AMONG THE KOREAN MIDDLE-AGED POPULATION**

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**Objectives:** Dry eye syndrome (DES) is a common eye disease caused by tear deficiency or excessive tear evaporation. Because the tear film layers play a major role in the pathogenesis of the evaporative dry eye, some previous papers have suggested the possible mechanism of dyslipidemia and DES. However, the previous results were inconsistent and few studies were conducted to find the independent relationship between dyslipidemia and DES. Therefore, we investigate that association of dyslipidemia with DES in the middle-aged Korean adults.

**Materials and Methods:** This study was conducted on 1,128 urban-dwelling participants (438 men and 690 women) enrolled in the Study of Environmental Eye Disease (2013-2017), after excluding people who have taken lipid-lowering medication. Participants with total cholesterol $\geq$ 240 mg/dl or HDL cholesterol $< 40$ mg/dl or LDL cholesterol $\geq 160$ mg/dl or triglycerides $\geq 200$ mg/dl are defined as having dyslipidemia. Using ocular surface disease index (OSDI), we measured the DES severity and defined DES as OSDI score $\geq 21$.

**Results:** Men with dyslipidemia had an odds ratio of 1.73 (95% confidence interval, 1.16-2.59) for DES in unadjusted model compared to those without DES. After adjusting for age, body mass index, hypertension, diabetes, occupations, smoking and drinking status, exercise, calendar-year of study, and the use of contact lens and computer, the adjusted odds ratio for DES was 1.81 (1.17-2.80) in men. However, there was no significant association between dyslipidemia and DES in women, even after stratifying by menopausal status.

**Conclusion:** Our findings suggest that dyslipidemia may be associated with the prevalence of DES in the Korean men, but not in women.

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**MP10-2**

**PREVALENCE OF LIPID ABNORMALITIES AMONG FILIPINO ADULTS**

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**Objectives:** An increasing trend of coronary artery disease deaths is seen in the Philippines with the main risk factors identified as hypertension and dyslipidemia. This study reviews the result of the 8th National Nutrition Survey (NNS) and determines factors associated with increasing odds of having lipid abnormalities in the Filipino population.

**Materials and Methods:** The 8th NNS employed a three-stage sampling design. The first stage was the selection of Primary Sampling Units (PSUs), consisting of one barangay or a combination of contiguous barangays with at least 500 households each. From these PSUs, enumeration areas (EAs) with 150-200 households were identified, from which housing units were randomly selected. The third and final stage was the random selection of the households, which was the ultimate sampling unit. Eligible members of the sampled households were included in the survey. Among the sampled households, 20,236 individuals consented to blood analysis for lipid profiling.

**Results:** Prevalence of lipid abnormalities was high (47%) in the sample population. Furthermore, very low HDL cholesterol (38%) and high triglycerides levels (47%) were also noted. It was found out that the odds of dyslipidemia is 1.5% higher in smokers than non-smokers; and alcohol drinkers than non-alcohol drinkers (OR: 1.44, p<0.0001). Also, the odds of dyslipidemia is 1.8% higher in patients with SBP>140mmHg and DBP>90mmHg (p<0.0001). Furthermore, dyslipidemia is twice more common in Filipino women than men. It was found out that Filipinos with high physical activity is 1.2 times less likely to develop dyslipidemia.

**Conclusion:** The increasing trend of lipid abnormalities among the Filipino population is associated with modifiable risk factors such as smoking, alcohol drinking, and sedentary lifestyle. Promoting health policies that would lead people to healthier lifestyle choices would be beneficial to the nation.

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THE RELATIONSHIP BETWEEN AGE WITH HYPERTENSION IN PRIMARY HEALTH CARE AT JATIYOSO INDONESIA: EPIDEMIOLOGY STUDY

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Objectives: This research is to know relation between age with hypertension in Puskesmas (Primary Health Care) Jatiyoso.

Materials and Methods: This was an analytic observation research with cross-sectional design. The study was conducted in the Puskesmas Jatiyoso (Primary Health Care) in April 2019. The sample came from 112 patients who examined themselves at the Puskesmas (Primary Health Care) Jatiyoso with a total sampling technique. In this study, most of the respondents were male, namely 79 people and 33 female. Data analysis using chi square test.

Results: Age is made into two classifications, the first classification is 45 years and above, and the second classification is less than 45 years. Statistical analysis showed that there was a relationship between age and the incidence of hypertension with a p value of 0.01 (< 0.05) and the result of OR = 22.667, CI 95% = 2.792 – 8.751.

Conclusion: There was significant correlation between age and hypertension in Primary Health Care Jatiyoso Indonesia.

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THE PREDICTORS OF CARDIOMETABOLIC MULTIMORBIDITY: AN EVIDENCE FROM LARGE POPULATION-BASED STUDY

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Objectives: To describe the prevalence of cardiometabolic multimorbidity (at least two from coronary artery disease [CAD], stroke, and type-2 diabetes mellitus [T2DM]) and identify the associated predictors among the population of Central-Jakarta City, Indonesia.

Materials and Methods: We conducted a population-based study examining 82,626 residents (10% of the total population) aged above 18 years old (y.o) who visited primary health care and community-based integrated health center (IHC) in 2017-2018. We collected data including blood pressure, body mass index (BMI), personal (PH) and family history (FH) of RF including smoking, T2DM, stroke, CAD, and dyslipidemia using standardized protocol.

Results: The prevalence of cardiometabolic multimorbidity was 0.43%, including 0.37% of subjects had 2 diseases, and 0.06% had 3 diseases. However, 3.5% of the subject s had only 1 disease. Premature cardiometabolic multimorbidity in subject >45 y.o accounted for 0.15% (65/43,049). Multivariate analysis showed that odds of cardiometabolic multimorbidity increased along with increasing BMI (obese [OR 1.3, p<0.05]), severe obese [OR 1.5, p<0.05]), increasing age [OR 3.8, p<0.0001], presence of FH of stroke [OR 2.4, p<0.0001], CAD (OR 2.9, p<0.0001), and T2DM (OR 5.8, p<0.0001), PH of HT (OR 7.6, p<0.0001) and dyslipidemia (OR 2.1, p<0.0001). Stratified analysis found that male with FH of stroke (OR 3.4, p<0.0001), DM (OR 7, p<0.0001), PH of dyslipidemia (OR 2.3, p<0.0001), and increasing age (OR 5.1, p<0.0001) had higher odds of developing cardiometabolic multimorbidity compared to female. Conversely female with FH of CAD had higher odds compared to male (OR 3.6, p<0.0001).

Conclusion: FH of CAD, stroke, and T2DM, PH of hypertension and dyslipidemia, increasing age and BMI, were independent predictors for cardiometabolic multimorbidity among the population of Central-Jakarta City. Regarding these findings, community-based prevention by PHC and IHC should be escalated with an effective strategy to reduce the burden of cardiometabolic multimorbidity.

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MP10-5

TRIGLYCERIDE AND GLUCOSE (TYG) INDEX AS A PREDICTOR OF MORTALITIES

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Objectives: The aim of this study was to evaluate the association between triglycerides and glucose (TyG) index and mortalities in a Korean population using a large health study database.

Materials and Methods: A total of 318,224 subjects (165,131 men and 153,093 women) in the Kangbuk Samsung Health Study cohort were enrolled. A comprehensive annual or biennial health examination was performed to all subjects from 2002 through 2012. Normal glucose tolerance (NGT) was defined as fasting plasma glucose < 100 mg/dL and Hba1c < 5.7 %, and having no history of diabetes. The presence of nonalcoholic fatty liver disease (NAFLD) was ascertained by ultrasonography in the absence of other known liver diseases. Mortality data (from 2002 through 2012) were derived from the Korea National Statistical Office.

Results: The cumulative overall mortality was 0.51% (1,613 deaths) during a median 5.66-year follow up. In subject with NGT, higher TyG index was associated with an increased risk of death from all causes (HR 1.12; 95% CI 1.03-1.22), cardiovascular disease (HR 1.26; 95% CI 1.02-1.55), and liver disease (HR 1.26; 95% CI 1.02-1.55) but not from cancer, after adjusting for age, sex, and body mass index. In addition, when we have analyzed according to the presence of NAFLD in this group, higher TyG index was only associated with an increased risk of death from all causes in subject without NAFLD (HR 1.16; 95% CI 1.05-1.29). However, there was no significant association between TyG index and mortalities in subject with prediabetes and diabetes. Interestingly, TyG index was associated with overall mortality in subjects with metabolic syndrome (HR 1.31; 95% CI 1.17-1.47) although it was not associated with specific mortalities. In subjects without metabolic syndrome, TyG index was not associated with death from all and specific causes.

Conclusion: The TyG index might predict mortalities in subjects with NGT and metabolic syndrome.

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MP10-6

Withdrawal
**Nutrition**

**MP11-1**

**MULBERRY FRUIT EXTRACT ALLEVIATES OBESITY-INDUCED ADIPOSE TISSUE INFLAMMATION IN RATS FED HIGH-FAT DIET**

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**Objectives**: Obesity is accompanied by chronic low-grade inflammation. This study was aimed to investigate the effect of high hydrostatic pressure extract of mulberry (Morus alba) fruit (ME) on obesity-induced adipose tissue inflammation in rats.

**Materials and Methods**: Male, Sprague-Dawley rats were randomly divided into 4 groups, and fed each experimental diet as follows: (1) low-fat diet (LFD, 10% kcal diet), (2) high-fat diet (HFD, 45% kcal diet), (3) HFD + 5 g/kg of diet (ME-L), (4) HFD + 10 g/kg of diet (ME-H). After 14 weeks of the experiment, the expressions of pro-inflammatory cytokines and nuclear NF-κB (nuclear factor kappa-light-chain-enhancer of activated B cells)/p65 were analyzed in white adipose tissue (WAT). In addition, mRNA levels of F4/80, a pan-macrophage marker, and M1/M2 macrophage markers were analyzed, and serum levels of nitric oxide (NO) were determined.

**Results**: Both ME-L and ME-H significantly decreased both mRNA expression and protein levels of tumor necrosis factor (TNF)-α, interleukin (IL)-6, and monocyte chemoattractant protein (MCP)-1 in WAT (p < 0.05). ME-H decreased nuclear NF-κB (p65) level in WAT (p < 0.05). In particular, the crown-like structures, observed by macrophages surrounding adipocyte, was reduced by the ME supplementation. The mRNA expression of F4/80, a pan-macrophage marker, was decreased in adipose tissue of the ME-H group (p < 0.05). In particular, both ME-L and ME-H decreased the mRNA expression of M1 macrophage markers, such as nitric oxide synthase 2 (NOS2), cluster of differentiation (CD) 68, CD11c, while increasing mRNA expression of M2 macrophage markers, such as arginase 1 (ARG1) and CD163 in WAT (p < 0.05). Moreover, nitric oxide (NO) level in serum was decreased in both ME supplemented groups (p < 0.05).

**Conclusion**: These results indicate that ME attenuates obesity-induced adipose tissue inflammation partially via inhibiting NF-κB signaling pathways and reducing macrophage infiltration and M1 type switching. Therefore, it is suggested that ME could be used for the treatment and prevention of obesity-induced inflammation.

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**MP11-2**

**MICROENCAPSULATION IMPROVED SURVIVABILITY OF LACTOBACILLUS PLANTARUM LAB12 CONFERRED ADVANTAGES TO ITS CHOLESTEROL-LOWERING EFFECT IN VIVO**

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**Objective**: Dietary probiotics are increasingly known for their excellent cholesterol-lowering effect against hypercholesterolemia, a major risk factor for coronary heart disease. Their vulnerability to high temperature and low pH has, however, limited their optimal use as food-based health supplements with cholesterol-lowering properties. In order to address these limitations, this study was undertaken to investigate the cholesterol-lowering effect of Lactobacillus plantarum LAB12 encapsulated in a unique blend of vegetable protein (pea protein) and carbohydrate against adult zebrafish fed with high-cholesterol diet.

**Materials and Methods**: The microcapsules were prepared using the oil emulsion/acidification technique. The resultant microencapsulated L. plantarum LAB12 were being exposed to simulated gastric juice (SGJ; pH 1.8), simulated intestinal fluid (SIF; pH 6.8) and high temperature (100 °C for 30 min). The cholesterol-lowering effect of microencapsulated L. plantarum LAB12 was then being validated in adult zebrafish over a period of 4 weeks.

**Results**: Microencapsulated LAB12 demonstrated excellent gastro-tolerance (only 4% cell death) in SGJ with maximum release of probiotics (>9 log CFU g⁻¹) in SIF after 30 min and thermal-resistant (only 20% cell death). Apart from retaining the intrinsic cholesterol-lowering effect of LAB12 in vivo, microcapsules conferred additional advantage in terms of yielding lower BMI (-10%) and increasing serum HDL level (+66.7%) when compared to free cells. In addition, microencapsulated LAB12 also alleviated triglyceride accumulation in the liver.

**Conclusion**: Microcapsules not only serve as an ideal protective micro-transport for cholesterol-lowering L. plantarum LAB12, but also confer additional advantages to their beneficial effects.

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**EVALUATION OF THERAPEUTIC POTENTIAL OF HONEY IN SUBJECTS WITH IMPAIRED GLUCOSE TOLERANCE**

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**Objectives**: In Indian Medicine system honey is believed as one of the valuable medicinal product. Honey is also found as a useful product in the management of dyslipidemia and diabetes mellitus. This study compares the effect of honey on fasting blood glucose level and lipid profile in subjects with impaired glucose tolerance (IGT) and normal healthy subjects.

**Materials and Methods**: After performing the OGTT on the basis of blood glucose level 28 subjects were selected for the study and were divided into two groups as IGT group (subjects with impaired glucose tolerance, n=14) and Normal group (Normal healthy subjects, n=14). Honey (70 gm) was administered to 28 subjects in empty stomach for 60 days. The effect on body weight, fasting blood glucose (FBG) and lipid profile was recorded.

**Results**: Honey administration lowered blood glucose levels and lipid levels in IGT and normal healthy subjects. HDL Cholesterol levels were slightly elevated in both groups. Significant reduction in BMI was found in both groups (P<0.05).

**Conclusion**: Consumption of honey has shown a reduction in body weight, BMI, FBG, Hba1c and improvement in lipid profile in IGT subjects.

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**THE EFFECT OF COMBINATION JICAMA CONCENTRATE (PACHYRHZUS EROSUS) AND KEFIR MILK AS A SYMBIOTIC DRINKS ON MALONDIALDEHYDE (MDA) LEVEL IN INTESTINE TISSUE OF HYPERLIPIDEMIC RATS**

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**Objectives**: Increasing reactive oxygen species (ROS) in hyperlipidemia may have effect on cell intestine damage. Malondialdehyde (MDA) level is one of cell damage biomarker. The combination of prebiotic from jicama concentrate and probiotic from kefir milk has proven can decrease lipid levels. The aim of this research is to know the effect of combination jicama concentrate (Pachyrhizus erosus) and kefir milk on MDA level in intestine tissue in hyperlipidemic rats.

**Materials and Methods**: The research used quasi-experimental with post-test only control group design. Twenty five rats divided into 5 groups, positive control (K+), negative control (K-), and 3 intervention groups (P1, P2, P3). All group except K- were given quail egg yolk with a dose of 5ml/200grBW for 4 weeks. For the next 4 weeks, the intervention group were given a symbiotic drink with a dose of 5ml/200grBW for 4 weeks with formulation P1: 85% kefir milk (S) 15% jicama concentrate (B), P2: 75% S 25% B, P3: 65% S 35 % B. Rat termination was carried out and intestine organ was taken. The MDA level was measured and the data obtained were analyzed by statistical software.

**Results**: Mean of MDA (mg/dl) intestine levels were 11.78 ± 0.21 (K+), 0.73 ± 0.05 (K-), 5.38 ± 0.28 (P1), 3.02 ± 0.14 (P2), 1.59 ± 0.11 (P3). The result showed significant differences of MDA levels in all group after given symbiotic drinks with p<0.001.

**Conclusion**: Symbiotic drinks significantly decrease MDA intestine levels in hyperlipidemic rat model.

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MP11-5

ASSOCIATION BETWEEN DIETARY IRON INTAKE, BODY IRON STATUS AND THE RISK OF TYPE 2 DIABETES IN KOREAN ADULTS WOMEN

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Objectives: This study aimed to investigate the association between dietary iron intake, body iron status and the risk of type 2 diabetes among the healthy Korean women.

Materials and Methods: Korean adult women without diagnosed disease (n=84) participated in the study. Thirty-nine of them were in post-menopausal status. Anthropometric parameters, glycemic index, lipid profiles, inflammatory markers, nutrient intake, dietary habits were investigated.

Results: Serum ferritin levels were positively correlated with BMI, insulin resistance, and hs-CRP before and after the adjustment. Serum ferritin levels were significantly correlated with triglyceride and HDL-cholesterol. Furthermore, total iron intake showed a significant association with ferritin levels even after the adjustment for age, menopausal status and total energy intake. In addition, total iron intake was positively correlated with hs-CRP. To investigate metabolic properties according to dietary iron intake levels, total iron intake levels in whole subjects were categorized into 4 groups (Q1-Q4). Based on Dietary Reference Intake for Koreans 2015 (KDRI 2015), only one person consumed excessive amount of iron over upper level (UL). Among the study participants, 62% consumed iron in between recommended nutrient intake and UL, and 37% consumed iron insufficiently indicating less than estimated average requirement. Ferritin levels tend to increase as total iron intake increased, and were significantly higher in Q4 group. In the glycemic parameters, HbA1c were significantly high in Q3 and Q4 groups, but the average values were in normal range. In addition, hs-CRP levels in Q4 were significantly higher than the other groups.

Conclusion: People with higher total iron intake even within UL of DRIs showed higher level of serum ferritin which may affect glycemic status. This result can be suggested as a one of scientific basis for optimal iron intake guideline for Korean women in the future.

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MP11-6

Withdrawal
**MP12-1**

Withdrawal

**MP12-2**

**DECREASE OF HDL-C IS ASSOCIATED WITH AGE, HOUSEHOLD INCOME, AND INCIDENCE OF DEMENTIA IN ADULTS FROM KNHNES 2017: CORRELATION ANALYSIS OF LOW HDL-C AND POVERTY**

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**Objectives**: Low serum HDL-C is a risk factor of cardiovascular disease and dementia. The prevalence of low HDL-C is gradually increased in developing and developed countries especially in Korea.

**Materials and Methods**: We selected 5,535 adult subjects (≥20 year-old) from Korean national health and nutrition examination survey 2017 (KNHNES, n=2,469 men, n=3,066 women). They were classified into five level of household income grade from 1 (the lowest income) to 5 (the highest). They also classified based on HDL-C level from quintile 1 (<40 mg/dL, n=943), quintile 2 (40-49 mg/dL, n=1764), quintile 3 (50-59 mg/dL, n=1572), quintile 4 (60-69 mg/dL, n=820), quintile 5 (≥70 mg/dL, n= 436).

**Results**: Generally, in both gender, higher HDL-C group showed larger percentage of income grade 5 (highest) and the lowest HDL-C group showed the largest percentage of income grade 1 (lowest). suggesting that the poverty is directly associated with low HDL-C. Both group exhibited significant increase of average income grade depends on increase of HDL-C level (men, p=0.03; women, p<0.001). Women group showed 3.3-fold higher number of dementia cases than men group at late-life. Sharp decrease of HDL-C after 50s was accompanied with dramatic increase of dementia incidence in women, while men group showed relatively mild decrease of HDL-C and increase of dementia incidence.

**Conclusion**: In conclusion, in both gender, lower income group showed larger percentage of low-HDL-C prevalence. The decline of HDL-C after middle age was strongly associated with explosive increase of dementia in late-life.

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MP12-3

NEUROPROTECTIVE EFFECT OF PEROXIREDOXIN1 FOLLOWING ISCHEMIC BRAIN INJURY

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**Objectives**: Inflammatory response is an essential cause of ischemia stroke damage. Reactive oxygen species (ROS) play a pivotal role in the induction disorder of inflammatory response. Under the inflammatory conditions, oxidative stress leads to infiltrate inflammatory cells across the blood brain barrier (BBB). Several studies suggested that immune responses induced by macrophages and DCs have essential roles in the ischemic stroke. However, there are no study that Peroxiredoxin 1 (Prdx1) antioxidant protein can initiate the antioxidant response and inhibit the inflammatory brain damage. This study demonstrated that deficiency of Prdx1 induced more severe damage at the ischemic stroke.

**Materials and Methods**: To explore the role of Prdx1 in the development of acute ischemic brain injury, Prdx1 deficient and WT mice to 1hr of middle cerebral artery occlusion (MCAO) followed by time based of 12hr, 24hr, 72hr reperfusion.

**Results**: Prdx1 deficient exhibited increased neurological deficits and enlarged brain infarction compared with Prdx1 WT mice. FACS results show that infiltrated inflammatory cells in the Prdx1 KO brain are increased dramatically through time lapse and also compared to Prdx1 WT brain. The immune responses shown different pattern that infiltrated macrophages were increased at the severe damaged Prdx1 KO brain compared to Prdx1 WT. Expression pattern of inflammatory cytokines also supports this results.

**Conclusion**: In conclusion, Prdx1 has protective role in the ischemic stroke through regulating immune system.

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MP12-4

Withdrawal
MP12-5

ADVERSE OUTCOMES AFTER MAJOR SURGERIES IN PATIENTS WITH DIABETES: A MULTICENTER MATCHED STUDY

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Objectives: The impact of diabetes on perioperative outcomes remains incompletely understood. Our purpose is to evaluate post-operative complications and mortality in patients with diabetes.

Materials and Methods: Using the institutional and clinical databases of three university hospitals from 2009-2015, we conducted a matched study of 16,539 diabetes patients, aged >20 years, who underwent major surgery. Using a propensity score matching procedure, 16,539 surgical patients without diabetes who underwent surgery were also selected. Logistic regressions were used to calculate the odds ratios (ORs) with 95% confidence intervals (CIs) for post-operative complications and in-hospital mortality associated with diabetes.

Results: Patients with diabetes had a higher risk of postoperative septicemia (OR 1.33, 95% CI 1.01-1.74), necrotizing fasciitis (OR 3.98, 95% CI 1.12-14.2), cellulitis (OR 2.10, 95% CI 1.46-3.03), acute pyelonephritis (OR 1.86, 95% CI 1.01-3.41), infectious arthritis (OR 3.89, 95% CI 1.19-12.7), and in-hospital mortality (OR 1.51, 95% CI 1.07-2.13) compared to people without diabetes. Previous admission for diabetes (OR 2.33, 95% CI 1.85-2.93), HbA1c >8% (OR 1.96, 95% CI 1.64-2.33) and fasting glucose >180 mg/dl (OR 1.90, 95% CI 1.68-2.16) were predictors for post-operative adverse events.

Conclusion: Diabetes patients who underwent surgery had higher risks of infectious complications and in-hospital mortality compared with patients without diabetes who underwent similar major surgeries.

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MP12-6

EFFECTS OF CASE MANAGEMENT PROGRAM FOR PATIENTS TYPE 2 DIABETES MELLITUS WITH CHRONIC KIDNEY DISEASE STAGE 3 IN WANGWISET HOSPITAL, TRANG PROVINCE, THAILAND

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Objectives: The aim of this study was to investigate the effects of case management on serum creatinine with estimated glomerular filtration rate (eGFR) and glycemic control glycosylated hemoglobin [HbA1c] of patients Type 2 Diabetes with Chronic Kidney Disease Stage 3.

Materials and Methods: This study used the quasi-experimental one-group pre-post test designed to measure the effects of the intervention using serum creatinine with estimated glomerular filtration rate (eGFR) and glycemic control glycosylated hemoglobin [HbA1c] of patients Type 2 Diabetes with Chronic Kidney Disease Stage 3. Thirty patients in Wangwiset Hospital selected by means of purposive, qualification-based sampling were given a case management program based on the National Case Management Task Force, the CMSA’s Board of Directors [2009] including comprehensive health assessment, a clinical pathway developed by a multidisciplinary team, health education, a workshop to exchange the knowledge to healthy and DASH diet such as low sodium diets, avoidance of sodium-containing seasonings, reduced fat diets and high fiber diets from vegetables and fruits in community and consultation with nurse case manager of diabetes mellitus and hypertension, a home visits, follow-up telephone calls and individual learning activities serum creatinine with estimated glomerular filtration rate (eGFR) and glycemic control glycosylated hemoglobin [HbA1c] tests was collected before and after the program in the twenty-fourth weeks. Descriptive statistics and paired t-tests were used to analyze the data.

Results: After the twenty-fourth weeks, it was found that serum creatinine with estimated glomerular filtration rate (eGFR) test increased and glycemic control in glycosylated hemoglobin [HbA1c] test decreased significantly [ p-value < .05 ]. The study findings support the effect of the case management program.

Conclusion: The findings of this study proved that the case management program is an essential component in the management of patients Type 2 Diabetes with Chronic Kidney Disease Stage 3 and should be applied for other chronic disease.

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Poster Exhibition

**Date & Time:** September 6 (Fri.) - 7 (Sat.)
**Place:** Poster hall (6F)
Lipid Metabolism / Genetics of Dyslipidemia

P001

EFFICACY OF CURCUMIN IN MANAGEMENT OF DYSLIPIDEMIA IN PATIENTS OF TYPE 2 DIABETES MELLITUS

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Objectives: To assess the efficacy of SNEC 30 capsules (Nano formulation of Curcumin) in the treatment of Dyslipidemia in type 2 diabetics.

Materials and Methods: In this Prospective, Comparative, Randomized trial 80 Type 2 diabetics taking oral hypoglycaemic agents were enrolled & divided into 2 groups; 1 group received standard conventional treatment (Physician prescribed) and the other group received SNEC 30 along with the conventional treatment for 12 weeks. HbA1c, Fasting and post-prandial Blood Sugar, Haematology & Biochemistry parameters were monitored at the baseline and at the end of treatment of 3 Months.

Results: At the end of 3 Months, a reduction in HbA1c levels by 0.5% as compared to basal values was observed. Blood sugar (fasting and/or post-prandial) decreased by more than 25% in the group receiving SNEC30 along with the conventional treatment as compared to conventional group. Overall Lipid profile of the dyslipidaemic patients on SNEC 30 improved considerably. There was improvement in the signs & symptoms score by more than 10% in the group receiving SNEC30 along with the conventional treatment as compared to conventional group were observed. Total cholesterol (TC) decreased from 189.83 to 164.13 (p value 0.216), LDL-C (142 to 118.15, p value 0.04), VLDL (38.3 to 28.8, p value 0.02), TG decreased significantly (178.2 to 162.5, p value= 0.01) in the SNEC 30 group. HDL increased from 32.1 to 36.3 (p value 0.17).

Conclusion: A 3-month SNEC 30 intervention along with the conventional treatment in type 2 Diabetic Patients significantly lowered the value of HbA1c and other applicable contributing parameters of diabetes. In addition, the SNEC 30 treatment appeared to improve diabetic signs and symptoms with very minor adverse effects. Therefore, this study demonstrated that the SNEC 30 intervention along with the conventional treatment in a type 2 diabetic population proves a significant reduction in diabetic testing parameter.

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P002

ASSOCIATION BETWEEN SINGLE NUCLEOTIDE POLYMORPHISM (SNP) OF ADIPONECTIN GENE (ADIPOQ) AND ATHEROSCLEROSIS DISEASE: A META-ANALYSIS

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Objectives: As a multifactorial disease, atherosclerosis disease results from various causalities of environmental exposures and genetic factors. Adiponectin (ADIPOQ), as an insulin-sensitive hormone, regulates glucose and lipid metabolism and also inhibits expression of vascular inflammatory molecules. SNP of ADIPOQ was indicated to be associated with atherosclerosis disease. However, previous studies showed inconclusive results. Thus, we conducted a study to analyze the association of seven SNPs of ADIPOQ (rs2241766, rs2241736, rs2241739, rs2263469, rs1501299, rs944523, rs182052) and atherosclerosis disease.

Materials and Methods: Major databases were searched for case-control and cohort studies, which assess the association of seven SNPs with atherosclerosis disease (coronary artery disease, stroke, and peripheral artery disease). The analysis was performed in RevMan 5.3 to calculate (fixed/random-effect model) the pooled measures (Relative Risk; 95% Confidence Interval) under Hardy-Weinberg Equilibrium based-on additive, dominant, recessive, and allele contrast genetic models.

Results: Fifty-two studies were enrolled including 16.175 cases and 25.503 controls. rs2241766 increased atherosclerosis risk through additive (RR=1.27 95%CI [1.01-1.60]), dominant (RR=1.14 [1.03-1.26]) and allele contrast (RR=1.15 [1.03-1.27]) model. Dominant (RR=1.09 [1.03-1.15]) and allele contrast model of rs266729 (RR=1.08 [1.03-1.14]) significantly increased risk. Under recessive model, risk was increased in East-Asian subgroup (RR=1.23 [1.02-1.47]) but decreased in Caucasian subgroup (RR=0.80 [0.64-0.98]). rs2241739 in East-Asian subgroup based-on dominant (RR=1.21 [1.02-1.45]) and allele contrast model (RR=1.21 [1.01-1.46]) had significant association with atherosclerosis. Additive model of rs222395 (RR=1.23 [1.05-1.44]), additive (RR=2.16 [1.16-4.01]) and recessive (RR=2.18 [1.17-4.05]) models of rs17300590 also increased risk. On the contrary, additive (RR=0.84 [0.73-0.96]) and recessive model (RR=0.81 [0.70-0.95]) of rs182052 decreased the risk of atherosclerosis development.

Conclusion: Our study showed that SNPs of ADIPOQ rs2241766, rs2263469, rs2241739, rs182052, and rs17300590 have an association with atherosclerosis disease in particular genetic model and could have been affected by ethnicity, while rs1501299 have no association.

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P003

STUDY OF THE EFFECT OF CURCUMA LONGA (SNEC 30) ON VARIOUS BIOCHEMICAL PARAMETERS IN TYPE 2 DIABETICS HAVING ORAL SUBMUCOUS FIBROSIS

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Objectives: 1. The effect of curcuma longa (SNEC 30) capsules and gel on various biochemical parameters and lipid profile in patients of Type 2 diabetes mellitus. 2. The efficacy of curcuma longa (SNEC 30) capsules and gel in alleviating the symptoms of oral submucous fibrosis in patients of Type 2 diabetes mellitus.

Materials and Methods: In this Prospective, Comparative, Randomized trial 80 subjects with burning sensation & reduced mouth opening (less than 30 mm) along with Type 2 diabetes were enrolled for the study from the OPD of Oral Medicine, Faculty of Dental Sciences, King George’s Medical University, Lucknow. Score on Visual Analogue scale for OSMF and baseline parameters of height, weight, BMI, Fasting & Post-prandial blood sugar, HbA1c and lipid profile were noted. 40 patients were given Self Nano Emulsifying Curcumin (SNEC 30) capsules thrice daily for 6 months while 40 were not given SNEC 30 (control group). Standard conventional treatment for diabetes was given to both groups. Follow up was done after 6 months.

Results: Statistically significant reduction in burning sensation (p value < 0.002), increased mouth opening (p < 0.004) was seen. For fasting and post prandial blood sugar p values were 0.04 and 0.028 respectively. HbA1c decreased from 8.7 to 7.1 (p value = 0.021, significant). Total cholesterol (TC) decreased from 172.53 to 154.13 (p value 0.3), LDL-C 112 to 78.15 (p value 0.03), VLDL 30.3 to 24.8 (p value 0.04), TG decreased 148.2 to 122.5 (p value 0.01) in SNEC 30 group. HDL increased from 39.6 to 41.3 (p value 0.11). A 45% difference existed in burning sensation and 25% difference was observed in mouth opening in diabetic OSMF patients on comparing the data of SNEC 30 and control group.

Conclusion: Curcuma longa has anti-inflammatory, antioxidant properties & accelerates wound healing which is already compromised in diabetics.

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Pathophysiology of Atherosclerosis / Vascular Biology

P004

METABOLIC PARAMETERS AS INDEPENDENT MARKERS FOR CORONARY ENDOTHELIAL DYSFUNCTION IN HUMANS

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Objectives: In human, there is no detailed investigation on relationships between metabolic parameters and coronary endothelial dysfunction. In this study, we investigated the relationships between various metabolic parameters and coronary endothelial function using intracoronary acetylcholine infusion test.

Materials and Methods: We performed coronary angiography (CAG) in patients who presented with chest pain, cardiac arrest and syncope. A total of 108 patients who did not show significant coronary artery stenosis in CAG were enrolled and intracoronary acetylcholine infusion test in LAD was performed. Cardiovascular risk factors and metabolic parameters such as the presence of diabetes mellitus (DM), metabolic syndrome, fasting glucose, fasting insulin, HgA1c, adiponectin, leptin, resistin, FABP-4 are measured.

Results: Mean age was 48.5±11.4 years (M=73, 68%). Fifty-two patients (48%) showed endothelial dysfunction in intracoronary acetylcholine provocation test. Endothelial dysfunction group included more DM (odds ratio 7.174, 95% CI 0.833-61.767, P=0.04) and higher HgA1c (5.83±0.93% vs 5.54±0.42%; P=0.05) and higher waist to hip ratio (0.95±0.08 vs 0.92±0.06; P=0.043) than in no endothelial dysfunction group. In addition, HgA1c (adjusted odds ratio 2.367, 95% CI 1.060-5.289, P=0.036), waist circumference (adjusted odds ratio 2.516, 95% CI 0.872-7.258, P=0.088) and HOMA (adjusted odds ratio 0.601, 95% CI 0.393-0.918, P=0.019) are independent predictors for the coronary endothelial dysfunction. Interestingly, HgA1c level was closely correlated with the degree of coronary artery diameter narrowing during the intracoronary acetylcholine infusion test (r=0.21, P=0.033). Not expected, other metabolic parameters that represent insulin resistance (QUICKI, adiponectin, leptin, leptin to adiponectin ratio, TNF-α, resistin, FABP-4) were not statistically different between endothelial dysfunction and no endothelial dysfunction groups.

Conclusion: Abnormal metabolic parameters such as high HgA1c and waist to hip ratio which reflect long-term metabolic status are independent predictors for coronary endothelial dysfunction in human. Our results suggest that longer exposure of abnormal metabolic conditions induce coronary endothelial dysfunction which may reflect abnormal cardiovascular conditions.

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HMG1 INCREASES MCP-1 PRODUCTION IN VASCULAR SMOOTH MUSCLE CELLS VIA 5-LO-DERIVED LTB4

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Objectives: The pro-inflammatory cytokine monocyte chemoattractant protein-1 (MCP-1) plays a major role in vascular inflammation, however, the active role of vascular smooth muscle cells (VSMCs) in MCP-1 expression in the injured vasculatures is unclear. Given the importance of high mobility group box 1 (HMGB1) in vascular injury and inflammation, this study determined MCP-1 expression in VSMCs exposed to HMGB1, and also evaluated the role of 5-lipoxygenase (5-LO) signaling pathways in HMGB1-induced MCP-1 expression.

Materials and Methods: VSMCs were ex plant cultured using rat thoracic aorta, and stimulated with HMGB1 (30 ng/ml), and then LTB4 secretion was determined by ELISA. The expression of 5-LO and MCP-1 in HMGB1-stimulated VSMCs was analyzed by Western blots.

Results: In cultured rat aortic VSMCs stimulated with HMGB1 (30 ng/ml), the secretion of LTB4 was markedly elevated in association with an increased expression of 5-LO. Likewise, MCP-1 expression in HMGB1-stimulated VSMCs was markedly increased, which was significantly attenuated in cells treated with a 5-LO inhibitor, zileuton. In response to LTB4, MCP-1 expression in VSMCs was increased dose-dependently, suggesting a potential importance of LTB4 in MCP-1 expression in VSMCs.

Conclusion: Based on the results of this study, it was suggested that 5-LO-derived LTB4 produced by HMGB1-stimulated cells increased MCP-1 expression in VSMCs of the injured vasculatures. Thus, the 5-LO-LTB4 signaling axis in VSMCs might serve as a potential target for future therapeutic strategies for vascular inflammation in the injured vasculatures.

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A NOVEL MACROPHAGE-DERIVED CYTOKINE SNINJ1 HAS AN ANTI-ATHEROGENIC EFFECT

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Objectives: It is well known that activated macrophages produce many pro-inflammatory molecules, such as cytokines and chemokines, which play a crucial role in the development of cardiovascular diseases. In contrast, there is a paucity of knowledge regarding macrophage-derived anti-inflammatory molecules, their mechanism of action and potential as therapeutics.

Materials and Methods: We assessed human and mouse atherosclerotic aortic tissue and serum samples to examine the correlation between Ninj1 (nerve injury-induced protein) expression and atherosclerosis progression. We used bone marrow (BM) transplantation (BMT) to generate Ldlr−/− mice that lack Ninj1 specifically in BM-derived cells. Mice were fed a western diet (WD) for 5 to 23 weeks and atherosclerotic lesions were investigated. To verify the anti-inflammatory role of Ninj1, we treated macrophages and mice with the peptides Ninj1.18 (ML66) and Ninj1.16,17 (PN12), which mimic the soluble form of Ninj1 (sNinj1).

Results: Our in vivo results conclusively show that there is a correlation between Ninj1 expression and the extent of human and mouse atherosclerotic lesions as well as activated macrophages. Whole-body and BM-specific Ninj1 deficiency significantly increased monocyte recruitment and the macrophages accumulation in atherosclerotic lesions of hyperlipidemic mice. Ninj1 was directly cleaved by MMP9 to generate a sNinj1 that exhibited anti-atherosclerotic effects, as assessed in vitro and in vivo. Treatment of activated macrophages with the mouse peptides, mL66 and mPN12, reduced pro-inflammatory gene expression. The continuous administration of mPN12 alleviated atherosclerosis by inhibiting the enhanced monocyte recruitment. Moreover, exposure of human macrophages to the human peptides, hML66 and hPN12, inhibited the transmigration of blood monocytes through endothelial cell monolayers.

Conclusion: Macrophage-expressed Ninj1 is cleaved by MMP9 and sNinj1 functions as an anti-inflammatory cytokine. Treatment of macrophages with peptide mimics of sNinj1 inhibits pro-inflammatory responses and monocyte recruitment, which ameliorates the progression of atherosclerosis. SNinj1 signaling is conserved in human macrophages and likely participates in human atherosclerosis.

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THE UPTAKE PATTERN OF 18F-SODIUM FLUORIDE RADIOIGAND IN BRAIN TISSUE AFTER ACUTE CEREBRAL INFARCTION

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Objectives: Positron Emission tomography with 18F Sodium fluoride (NaF) radioligand has been actively applied in atherosclerosis research field because it is known to detect microcalcification activity within atheroma. We investigated whether NaF shows any uptake in brain tissue among acute ischemic stroke patients.

Materials and Methods: This is a post-hoc analysis of cerebral atherosclerosis research with positron emission tomography which compared the two radioligands, 18F fluorodeoxyglucose and NaF for the detection of culprit atheroma among 20 acute cerebral infarction patients. We measured the NaF uptake level at cerebral infarcted area as well as cerebellum and pons as references. The correlation analysis was performed between NaF uptake levels and findings from various brain MRI sequences including diffusion weighted image (DWI) disclosing acute ischemic cell death, susceptibility weighted image disclosing hemorrhagic injury, fluid attenuation inversion recovery and post-gadolinium enhancement disclosing blood brain barrier disruption, as well as clinical variables including neurological severity and laboratory data.

Results: We included 20 stroke patients (mean age=75.1 ± 9.0 years; 10 women). The NaF uptake levels were significantly elevated in high signal intensity lesions from DWI (0.65 ± 0.21 versus 2.51 ± 0.56, p=0.034 by Mann-Whitney U test), but its uptake levels were not different in hemorrhagic tissue or area with postgadolinium enhancement. The intensity of NaF uptake showed significant correlation with neurological severity (r=0.455, p=0.044 by Spearman correlation) and white blood cell count (r=0.618, p=0.004 by Spearman correlation).

Conclusion: This study shows that NaF was upregulated in infarcted brain tissue and correlated with neurological severity, suggesting that NaF could not only represent calcification activity, but also disclose acute ischemic cell death after stroke.

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A PIVOTAL ROLE OF MONOCYTE BLTR1 IN VASCULAR RESTENOSIS IN A MURINE WIRE-INJURED FEMORAL ARTERY

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Objectives: Leukotriene B4 (LTB4) signaling axis is involved in various inflammatory diseases, however, the precise role in vascular inflammation remains unclear. On the basis of the facts that monocyte-to-macrophage differentiation (MMD) is a key component in vascular inflammation, this study investigated the importance of LTB4 signaling in monocytes on MMD with subsequent vascular inflammation.

Materials and Methods: BMDCs isolated from mice were cultured, and then stimulated with high-mobility group box 1 (HMGB1) to induce MMD. The surface expression of marker proteins (CD11b) for macrophage was analyzed using FACS. The importance of 5-LO and BLTR1 in monocytes was analyzed using 5-LO/BLTR1-deficient cells isolated from 5-LO/BLTR1-deficient mice.

Results: The surface expression of marker proteins (CD11b) for macrophage was markedly increased in BMDCs stimulated with HMGB1, which were attenuated in cells treated with Zileuton, a 5-LO inhibitor as well as in 5-LO-deficient BMDC. These attenuated MMD in 5-LO-deficient cells was reversed by treatment with LT4. The pivotal role for BLTR1 in HMGB1-induced MMD was demonstrated using BLTR1-deficient monocytes, suggesting a pivotal role for LTB4-BLTR1 signaling axis in HMGB1-induced MMD. In vascular inflammation induced by wire injury of mice femoral artery, both macrophage infiltration and intimal hyperplasia were markedly attenuated in BLTR1-deficient mice, which were reversed in BLTR1-deficient mice transplanted with monocytes from control mice.

Conclusion: Based on the results of this study, BLTR1 in monocytes was suggested as a pivotal player in MMD with subsequent infiltration of macrophage in neointima, leading to vascular remodeling in the injured vasculatures.

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ROLE OF APE1/REF-1 ON PHOSPHATE-INDUCED CALCIFICATION AND OSTEOSTATIC PHENOTYPE CHANGES IN VASCULAR SMOOTH MUSCLE CELLS

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Objectives: Vascular calcification plays a role in the pathogenesis of atherosclerosis, diabetes, and chronic kidney disease; however, the role of apurinic/apyrimidinic endonuclease 1/redox factor-1 (APE1/Ref-1) in inorganic phosphate (Pi)-induced vascular smooth muscle cell (VSMC) calcification remains unknown. In this study, we investigated the possible role of APE1/Ref-1 in Pi-induced VSMC calcification.

Materials and Methods: VSMCs were obtained from the thoracic aortas of 8-week-old male Sprague-Dawley rats using a tissue explant and enzymatic digestion method. VSMC calcification was induced calcification medium consisting of DMEM supplemented with 10% FBS, 5 mM Pi (a mixture of NaH2PO4 and Na2HPO4 (pH 7.4)), and 50 μg/mL ascorbic acid. To investigate whether VSMC calcification was apoptosis related, cytotoxicity was determined by measuring LDH activity in the cell-culture medium. We are using the adenovirus system and siRNA transiently transfected for APE1/Ref-1 overexpression and knock-down. Alizarin red S staining was used to assess the calcium deposition and Intracellular ROS levels were measured using the fluorescent probe H2DCFDA in VSMC.

Results: We observed that Pi decreased endogenous APE1/Ref-1 expression and promoter activity in VSMCs, and that adenoviral overexpression of APE1/Ref-1 inhibited Pi-induced calcification in VSMCs and in an ex vivo organ culture of a rat aorta. However, a redox mutant of APE1/Ref-1(C65A/C93A) did not reduce Pi-induced calcification in VSMCs, suggesting APE1/Ref-1-mediated redox function against vascular calcification. Additionally, APE1/Ref-1 overexpression inhibited Pi-induced intracellular and mitochondrial reactive oxygen species production, and APE1/Ref-1 overexpression resulted in decreased Pi-induced lactate dehydrogenase activity, pro-apoptotic Bax levels, and increased anti-apoptotic Bcl-2 protein levels. Furthermore, APE1/Ref-1 inhibited Pi-induced osteoblastic differentiation associated with alkaline phosphatase activity and inhibited Pi-exposure-induced loss of the smooth muscle phenotype.

Conclusion: Our findings provided valuable insights into the redox function of APE1/Ref-1 in preventing Pi-induced VSMC calcification by inhibiting oxidative stress and osteoblastic differentiation, resulting in prevention of altered osteoblastic phenotypes in VSMCs.

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RANKL BLOCKADE SUPPRESSES PATHOLOGICAL ANGIOGENESIS AND VASCULAR LEAKAGE IN ISCHEMIC RETINOPATHY

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Objectives: Receptor activator of NF-κB ligand (RANKL) is a member of the TNF superfamily. RANKL increases endothelial permeability and induces angiogenesis, suggesting its critical roles in the vasculature. Despite the evidence implicating RANKL in vascular pathology, its role in ischemic retinopathy has not been previously reported.

Materials and Methods: Neonatal mice were exposed to 75% oxygen from postnatal day (P)7 to P12 to induce vaso-obliteration, and then returned to room air from P12 to P17, causing the retina to become hypoxic and inducing vascular endothelial growth factor (VEGF) signaling, which produces pathological neovascularization. On P12, the mice received a single intravitreal injection of control IgG1 or RANK-Fc, and retinas were obtained at P17.

Results: On P17, RANKL was expressed strongly and selectively in the neovascular tufts (NVT) area. RANKL colocalized with αSMA or PDGFRβ in NVT. However, co-immunostaining revealed that CD31-positive areas were not the same as RANKL, which indicates that RANKL might be produced by retinal pericytes, not endothelial cells. Consistent with this finding, chemical hypoxia upregulated RANKL expression in cultured human retinal pericytes but not in endothelial cells. Treatment with RANK-Fc markedly reduced the NVT area compared to that in mice administered the IgG1 injection. In contrast, the central avascular region of RANKL-Fc retina was comparable to the controls. In addition, we assessed retinal vascular permeability using FITC-labeled dextran. RANK-Fc treated mice displayed decreased vascular leakages compared to those injected with IgG1.

Conclusion: Our work supports the use of an RANKL blockade as a potential therapeutic approach against ischemic retinopathies.

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**P011**

**INSULIN/IGF-1 RECEPTOR SIGNALING IS ESSENTIAL FOR SINUS NODE FUNCTION**

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**Objectives** : Insulin and insulin-like growth factor 1 (IGF-1) signaling has been known to regulate cell growth, metabolism, contractility, autophagy, and senescence in the heart. However, the role of insulin/IGF-1 receptor (IGF-1R) in heart rhythm has not been explored.

**Materials and Methods** : Here, we generated cardiac conduction system-specific insulin receptor (IR) and IGF-1R double KO mice to evaluate the role of these growth factor receptors in the regulation of cardiac rhythm and rate. In IR-/-;IGF-1R-/-;HCN4-CreERT2 sinoatrial node, IR and IGF-1R proteins were deleted at 5 weeks following four consecutive tamoxifen injections.

**Results** : To characterize the cardiac phenotype of IR-/-;IGF-1R-/-;HCN4-CreERT2 mice, isolation of beating sinoatrial node preparation, telemetric in vivo electrocardiography, and echocardiography was performed. On the basis of these experiments we demonstrate that IR-/-;IGF-1R-/-;HCN4-CreERT2 mice display sinus node dysfunction characterized by bradycardia, sinus dysrhythmia, and recurrent sinus pauses at 12 weeks following tamoxifen injections.

**Conclusion** : Thus, we propose that IR/IGF-1R are crucial for stable heart rhythm and rate to stabilize pacemaker cells within the sinoatrial node.

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**P012**

**SILDENAFIL REDUCES NEOINTIMAL HYPERPLASIA AFTER ANGIOPLASTY AND INHIBITS PLATELET AGGREGATION VIA ACTIVATION OF CGMP-DEPENDENT PROTEIN KINASE**

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**Objectives** : Restenosis and stent thrombosis after stent implantation are one of the devating issues in interventional cardiology. Sildenafil has shown its effect in reducing cardiac hypertrophy as well as improving erectile dysfunction through protein kinase G (PKG) activation. In this study, we investigated the effects of PKG activation by sildenafil on platelet aggregation and neointimal hyperplasia.

**Materials and Methods** : We developed an in vivo model of Restenosis after balloon injury. Rat VSMCs are cultured in Sildenafil treated condition. For platelet aggregation, platelet rich plasma from rat was analysed.

**Results** : In terms of restenosis after vascular injury, sildenafil significantly reduced neointimal hyperplasia in rat carotid arteries compared to control group. This effect of sildenafil was accompanied by the reduction of viability, cell cycle progression, and migration of VSMCs. This was also confirmed in the injured arteries in vivo. Further studies showed that the increased PKG activity by sildenafil inhibited PDGF-stimulated phenotype change of VSMCs from a contractile to a synthetic form. Conversely, the use of PKG inhibitor or gene transfer of dominant-negative PKG reversed the effects of sildenafil, resulting in the increased viability of VSMCs and neointimal formation. In addition, the mice treated with sildenafil showed the facilitated re-endothelialization, compared to control group. Furthermore, we confirmed the effect of sildenafil through PKG activation using cGK-KO mice. Interestingly, sildenafil significantly inhibited platelet aggregation induced by ADP or thrombin. This effect was reversed by PKG inhibitor, suggesting that sildenafil inhibits platelet aggregation via PKG pathway. Furthermore, assays for VASP phosphorylation and P-selectin activation showed the same inhibitory effect of sildenafil on platelet activation.

**Conclusion** : This study showed that sildenafil inhibits not only platelet aggregation, but also neointimal hyperplasia through the PKG pathway. These findings suggest that sildenafil could be a promising candidate drug of drug-eluting stents for the prevention of restenosis without other complications such as stent thrombosis.

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P013

AGE AND SEX MATCHED CASE CONTROL STUDY ON EVALUATION OF MODIFIED RISK FACTORS OF HYPERTENSION

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Objective: Hypertension is the major cause of mortality and morbidity both in developing and developed countries. There are some intrinsic risk factors such as family history and there are some modified risk factors to hypertension. Modified risk factors are preventable and include obesity, physical inactivity, high salt diet, smoking, alcohol consumption low dietary potassium, stress, diabetes and socioeconomic status. We mainly try to find the main independent modified risks of hypertension in a matched case control study.

Materials and Methods: We evaluated 112 cases with hypertension and 112 controls without hypertension in this study. Cases were recently diagnosed hypertensive outpatients and controls were age and sex matched non hypertensive individuals. Modified risk factors were collected using questionnaires and evaluated between cases and controls and put in multiple regression model to find the independent association of them with hypertensive status of the individuals.

Results: Mean age of individuals were 53.4 years and 44.6% were female. Among all the evaluated risk factors obesity, physical inactivity, high salt diet, smoking, alcohol consumption, stress and diabetes were significantly different between cases and controls (all p values < 0.05). Obesity, Smoking and diabetes were significantly and independently associated with hypertension status in multiple logistic regression models.

Conclusion: Modified risk factors are very important in public health perspective of hypertension. We can improve lives of many people by managing these risk factors especially Obesity, Smoking and diabetes that had been proven to be independently predict status of hypertension in the individuals.

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P014

THE RELATIONSHIP BETWEEN GENDER AND SMOKING WITH HYPERTENSION AT DANUKUSUMAN PRIMARY HEALTHCARE KRATONAN INDONESIA: EPIDEMIOLOGY STUDY

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Objective: This study aims to determine the relationship between gender and smoking with hypertension at RT 4 RW 7 Danukusuman Primary Healthcare Kratonan.

Materials and Methods: This was an analytic observation research with cross sectional design. This research conducted at RT 4 RW 7 Danukusuman Primary Healthcare Kratonan. The number of samples in this study were 52 people (respectively 29 men and 23 women) using total sampling method. It analyzed using Chi-Square test.

Results: In this study, the number of men were more than women, where 13 people tended to smoke, 37 people with normal tension, and 15 people with hypertension. There was no significant correlation between gender and hypertension with p = 0,104 (p > 0,05), but there was a significant correlation between smoking and hypertension with p 0,000 (p < 0,05; OR = 22,667, CI 95% = 4,597 – 111,775).

Conclusion: There was no significant correlation between gender and hypertension, but there was a significant correlation between smoking and hypertension at RT 4 RW 7 Danukusuman Primary Healthcare Kratonan.

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DO OBESITY AND NON OBESITY WERE DIFFERENCE SELF–CARE FOR WEIGHT CONTROL IN HYPERTENSION

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Objectives: To investigate the prevalent of obesity in hypertension and compare of self-care for weight control among hypertension with obesity and non obesity.

Materials and Methods: analyzed secondary data from 3 cross sectional studied which consisted of 1,003 hypertensions (532 women, 272 men) who attend primary health care units in ASUNTA Medicare Nepal. Patients aged 25-85 years old mean of 67-12.57 years old women and men were similar aged (67.33-12.71 vs 66.14-12.17, p=0182)body mass index was categorized based on asian criteria, which BMI>23.0kg/m² was classified to obese, and BMI23.0kg/m² was classified to non-obese self-care was assessed by using a-20 items questionnaires of self-care maintenance for hypertension index Nepali version, which was modified from the original version of babara rienga there self care for weight control regimen were diet, exercise and weight control patients responded on a-4 rating scale from 1 never or rarely to 4, always or daly scores on each regimen and total self-care were standardized to a score of 100.a score of .70 indicated poor self we used chi square to compare self care for weight control among hypertension with obesity and non obesity .

Results: Hypertension was obesity (59.3%) The prevalence of obesity in women and men were differences (45.1% and 14.3% p=008) self care for weight control were rate of 28.6%diet, 58.5% exercise, 49.1% weight control and 35.4% total self care score on all self-care regimen and total self care among obesity and non obesity were not differences. Moreover self care in obesity compared with non obesity self care all regimen and total self care were not difference.

Conclusion: High prevalence of obesity and poor self-care for weight control is found in hypertension intervention that focus on self-care behaviors may be more effective then education program change in some health care system and national policies are needed to support patients to increase their self-care maintenance.

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APPLYING ARTIFICIAL INTELLIGENCE IN EARLY DETECTION OF HYPERTENSION THROUGH CLASSIFICATION TECHNIQUE USING FUZZY LOGIC

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Objectives: To detect the Hypertension based on classification technique.

Materials and Methods: To solve the problem about hypertension based on the available factors, the study use Fuzzy Decision Tree method to classify the risks of hypertension that have initialization stages of Fuzzy values, the calculation of Fuzzy entropy values, and the values of information gain, as well as defuzzification to determine the result of the classification.

Results: The testing that has been carried out could result in the highest accuracy value, which is 80%, derived from the testing of 30 training data dan 20 testing data, as well as the combination of the FCT and LDT value.

Conclusion: The conclusion of the research that has been accomplished is that Fuzzy Decision Tree can solve the problems in the classification of hypertension risks quite well.

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P017

MORINGA OLEIFERA ROOT EXTRACT LOWERING TRIGLYCERIDE LEVEL OF HIGH FAT DIET AND STREPTOZOTOCIN-NICOTINAMIDE INDUCED RATS MODEL

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Objectives: Moringa oleifera contains flavonoid, alkaloid, isothiocyanates, carotenoid, saponin, and beta sitosterol that have potential to decrease triglyceride level as one of atherogenic lipid component. The aim of this study is to determine triglyceride lowering effect of Moringa oleifera root extract in high fat diet and streptozotocin-nicotinamide induced rats model.

Materials and Methods: This study was an experimental laboratory with pretest-posttest control group design. This experiment using 30 male wistar rats (Rattus norvegicus), weight 150-200 gram, aged 2-3 months chosen with purposive sampling. The sample then divided into 5 groups (K1, K2, K3, K4, K5) using random sampling technique, each group contains 6 samples. K1 were fed with standard pellet as negative control for 56 days. K2, K3, K4, K5 were fed with high fat diet (HFD) for 28 days and injection of streptozotocin-nicotinamide (STZ-NA) at day 25. Then, each group were given moringa oleifera root extract at dose 0 mg/kg, 150 mg/kg, 250 mg/kg, 350 mg/kg for 28 days. Triglyceride level obtained by spectrophotometry method and DiaSys Kit. The data were analyzed using Shapiro-wilk, repeated anova continued with posthoc bonferroni, and one way anova continued with posthoc Tukey HSD.

Results: There were significant difference of triglyceride level between day 0, 25, 29, and 57 for all groups tested with repeated anova (p<0.05) and posthoc bonferroni (p>0.05). One way anova (p=0.00) and Tukey HSD (p<0.05) showed significant difference between each group at day 57. K5 compared to K2 (positive control) has the greatest mean difference (47.18), followed by K4 (34.8) and K3 (19.7) after treated with Moringa oleifera root extract.

Conclusion: Moringa oleifera root extract at dose 150 mg/kg, 250 mg/kg, and 350 mg/kg have significant effect on lowering triglyceride level in high fat diet and streptozotocin-nicotinamide induced rats model.

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P018

INVESTIGATING THE PROTECTIVE EFFECT OF JICAMA CONCENTRATE AND KEFIR GRAINS ON HISTOPATHOLOGICAL HEART COLLAGEN CHANGES INDUCED BY HYPERLIPIDEMIA CONDITION IN RATS: AN ANALYTIC STUDY

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Objectives: Hyperlipidemia condition has a correlation with heart disease, resulting accumulation of collagen in myocardium. Management of hyperlipidemia is still being developed. Symbiotic can be used for hyperlipidemia therapy. This study aims to contribute a new knowledge by investigating whether Jicama Concentrate and Kefir Grains as a synbiotic drink have a protective effect on hyperlipidemia rat’s heart collagen.

Materials and Methods: In this study, 25 rats with each 5 group consists of 5 rats were divided; K- for the negative control, K+ for the positive control, P1, P2, and P3 for the intervention group. To make the rats in hyperlipidemia condition, K+ and the intervention group were given quail egg yolks 500 mg/kg BW/day in the first 4 weeks. The intervention group were also given 500 mg/kg BW/day symbiotic drink with different concoction in the next 4 weeks. The concoction consists of Jicama Concentrate and Kefir Grains (JC%:KG%): P1 (70:30); P2 (30:70); P3 (50:50). All interventions were administered into the rats using sonde. In the end, the rats were terminated, the right heart were taken and longitudinally dissected. The heart muscle was stained with hematoxylin eosin. Image-J application was used to measure the area fraction of collagen. The data were analyzed using statistic software.

Results: Data are expressed in mean ± standard deviation (%) form; K+: 2.01 ± 0.49, K-: 0.04 ± 0.01, P1: 0.21 ± 0.03, P2: 0.19 ± 0.06, P3: 0.35 ± 0.1. The data were analyzed using one-way ANOVA, showing significant value (p<0.05). Based on post hoc test, there are no significant differences between P1 with K-, P2 with K-, and P3 with K-.

Conclusion: Jicama concentrate and kefir grains as a synbiotic drink have a protective effect on hyperlipidemia rat’s heart collagen. It was shown by the significant decrease in rat’s heart collagen.

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ROLE OF LIRAGLUITIDE (GLP-1 DERIVE ANTIDIABETIC AGENT) ON IMPROVING LEFT VENTRICULAR FUNCTION IN PATIENTS WITH ST-ELEVATION MYOCARDIAL INFARCTION: A SYSTEMATIC LITERATUR REVIEW

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Objectives: ST elevation myocardial infarction (STEMI) is a leading cause of mortality and morbidity. Elevation of blood glucose, inflammation and endothelial dysfunction is common metabolic disorder among patients with STEMI and leading to decrease in cardiac function. Liraglutide was known for its antihyperglycemic and anti-inflammatory effect. We analyzed the effect of liraglutide on left ventricular function in patients with STEMI.

Materials and Methods: A literature search was conducted using PubMed and capturing the data from the past 10 years. Terms used included MeSH headings for liraglutide and STEMI. A systematic review of published studies was performed. Articles including STEMI patients being treated with standard guideline treatments and liraglutide were included. We analyzed the effect of liraglutide on left ventricular function.

Results: Elevated blood glucose, inflammation and endothelial dysfunction associated with adverse prognosis in patient with STEMI. Hyperglycemia enhanced thrombin formation, platelet activation and fibrin clot resistance aggravated myocardial infarction, decreased cardiac function and leading to heart failure in future. Eligible study show that liraglutide (GLP-1) promote glucose uptake, modulate glucose levels, ameliorate inflammation, cardioprotective effect during ischemic reperfusion injury and enhance recovery cardiac function. Liraglutide was safe and well tolerated. A 7-day course of liraglutide in STEMI patients shown an improvement in left ventricular ejection fraction (LVEF) at 3 months after (P<0.005). The mean reductions in HbA1c, troponin T levels, serum HsCRP, Endothelin-1 and IL-6 levels were also significantly greater in the liraglutide group than in the control. Liraglutide also increased Nitrite Oxide/Nitrit Oxide Synthase.

Conclusion: Liraglutide improved Left ventricular ejection fraction (LVEF) and elicited favorable changes in marker inflammation and endotelial dysfunction.

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ANTI-HYPERLIPIDEMIC EFFECT OF SYNBIOTIC DRINK OF KEPEL (STRELECHOCARPUS BURAHOL) WITH ADDITION OF LACTOBACILLUS CASEI AND LACTOBASCILLUS PLANTARUM ISOLATES ON RATS (RATTUS NORVEGICUS) - INDUCED HIGH-FAT DIET

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Objectives: This research aims to know the effect of a symbiotic drink of Kepel with the addition of Lactobacillus casei and Lactobacillus plantarum on lipid profile of rats induced High-Fat Diet.

Materials and Methods: This research used pretest and posttest randomized control group design. Fifteen rats divided into 3 groups. The negative control group and interfered group fed 20 grams of high-fat diet ad libitum for a month. While the positive control fed by standard diet. Simultaneously, the interfered group also was given symbiotic drink at the dose 1% of body weight every day orally. The lipid profile being measured are total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL), and high density lipoprotein (HDL). The lipid profile was measured before and after all of the intervention. ANOVA with bonferroni post-hoc test was used in statistical analyzing

Results: The lipid profile (mg/dl) before the intervention were: TC (K+= 93.09 ± 1.35, K= 94.08 ± 3.74, P= 93.94 ± 4.15), TG (K+= 74.39 ± 2.56, K= 76.93 ± 2.51, P= 79.27 ± 2.95), LDL (K+= 23.84 ± 1.62, K= 25.70 ± 1.46, P= 22.24 ± 0.82), HDL (K+= 83.04 ± 1.10, K= 82.91 ± 1.14, P= 83.74 ± 1.10). After a month intervention the lipid profile after were: TC (K+= 95.71 ± 2.77, K= 203.86 ± 7.43, P= 124.29 ± 8.22), TG (K+= 79.36 ± 3.07, K= 159.20 ± 5.08, P= 107.41 ± 4.19), LDL (K+= 76.97 ± 2.63, P= 38.99 ± 3.67), HDL (K+= 81.92 ± 1.42, K= 24.11 ± 1.63, P4= 60.96 ± 2.95). The statistical analysis showed that there were significant differences in lipid profile between each group after a month intervention (p<0.001).

Conclusion: Administration of symbiotic drink of kepel with the addition of Lactobacillus casei and Lactobacillus plantarum has a potency to be used as an anti-hyperlipidemic agent.

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P021

EFFECT OF RAPAMYCIN AND ATORVASTATIN ON ATHEROSCLEROSIS IN APOLIPOPROTEIN E-DEFICIENT MICE WITH CHRONIC RENAL FAILURE

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Objectives: Chronic renal failure (CRF) is a proinflammatory state that accelerates atherosclerosis and increases cardiovascular morbidity and mortality. Atorvastatin and rapamycin (mTOR inhibitor) are known to inhibit atherosclerosis in non-CRF conditions, however, their effect on CRF-induced atherosclerosis is still unclear. We aimed to analyze the effect of atorvastatin and rapamycin on the progression of atherosclerosis in the Apolipoprotein E-Deficient (ApoE−/−) mice with CRF.

Materials and Methods: The mice were randomly assigned to 5 groups, including 1 group with normal renal function (sham-operated) and the other 4 with surgically induced (by 5/6 nephrectomy) chronic kidney failure (vehicle vs. atorvastatin vs. rapamycin vs. atorvastatin+rapamycin). While western diets and autoclaved water were provided to the mice ad libitum, atorvastatin (10 mg/kg) and/or rapamycin (0.5 mg/kg) were administered by daily oral gavage for 10 weeks. Aorta and aortic sinus are stained with Oil Red O to compare the size of atherosclerotic lesions. Serum levels of calcium, phosphorus, BUN and creatinine were measured.

Results: Rapamycin and rapamycin+atorvastatin groups shows markedly decreased the area of atherosclerosis in en face and aortic sinus, compared to vehicle and atorvastatin alone. There was no statistically significant difference in atherosclerotic lesions between atorvastatin alone and vehicle.

Conclusion: Rapamycin significantly reduced the development of atherosclerosis and decreased proinflammatory cytokines in CRF-induced ApoE−/− mice. However, atorvastatin did not have atherosclerosis inhibitory effect in CRF condition. To reduce major cardiovascular event in patients with CRF, a more powerful method is needed than with statins.

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P022

SAFETY AND TOLERABILITY OF ATORVASTATIN CALCIUM ANHYDROUS IN KOREAN PATIENTS WITH DYSLIPIDEMIA: AN UPDATED THE FINAL ANALYSIS FROM THE LAMP STUDY

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Objectives: The Lipidou safety study for Korean dyslipidemia Patients (LAMP) study is an observational study evaluating the safety and tolerability of atorvastatin calcium anhydrous in over 20,000 Korean patients with dyslipidemia.

Materials and Methods: The final analysis from the LAMP study was conducted for 21,566 (108% enrollment) patients who were treated with atorvastatin calcium anhydrous at 404 medical institutions (72% in general out-patient clinics and 28% in large hospitals) in Korea from the start of surveying of this drug in February 2015. Data was collected and analyzed independently by the independent data monitoring committee (IDMC).

Results: Of the total 22,890 patients enrolled, 21,545 were evaluated. Mean age of enrolled patients was 61±12 years; 51% were female and 38% were old age (more than 65 year-old). Sixty-five percent of patients had comorbid diseases (vascular disorders, 38%; metabolic diseases, 23%; cardiac disorders 13%). Ninety-three percent of patients were well tolerated with treatment of atorvastatin calcium anhydrous and continued the medicine during 12±4 weeks. Seventy-six of 21,545 patients (0.35%) taking this drug discontinued treatment because of an adverse event (AE). The occurrence of any AE and adverse drug reaction (ADR) were 1.95% and 0.26%, respectively. The three most common ADRs were musculoskeletal problem including myalgia and arthropathy (0.09%), gastrointestinal problem (0.06%) and Nervous system problem (0.04%). Serious AEs were observed in 40 patients (0.19%). Seven patients died although none were considered related to the study treatment (1 Myelodysplastic syndrome, 1 Asthma, 1 Cardiac arrest, 1 worsened pancreatic carcinoma, 1 Subarachnoid hemorrhage, 1 Death, 1 Bronchopneumonia). There was no serious ADRs.

Conclusion: Based on this result of the final analysis from the LAMP study reflecting a real world treatment, atorvastatin calcium anhydrous is considered as a therapeutic agent for patient with dyslipidemia with few safety concerns.

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THE EFFECT OF GIVING ORANGE WATER KEFIR ON SUPEROXIDE DISMUTASE (SOD) SERUM ACTIVITY IN HYPERLIPIDEMIC RAT (RATTUS NOVERGICUS)

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Objectives: Hyperlipidemic state decreases serum Superoxide Dismutase (SOD) as the reverse marker of oxidative stress. Previous researches have shown that both orange and water kefir can improve SOD and lipid profile. The aim of this study is to know the effect of orange water kefir on serum SOD activity in the hyperlipidemic rat.

Materials and Methods: 15 rats (Rattus norvegicus) were divided into 3 groups (K+, K-, and B). In 4 weeks, K+ and B groups were given 5ml/200gr body weight dose of quail egg yolk. The next 4 weeks, K+ and K- groups were fed ad libitum without intervention and B group was given 5ml/200gr body weight dose of orange water kefir. The drink was made corresponding with water kefir making procedure standards. Sonde method was used for the intervention. The serum then underwent laboratory test for SOD and the result was further analyzed with SPSS.

Results: The mean ± deviation standard of serum SOD activity (%) for K+ group is 20.35 ± 2.15, K- group 79.28 ± 2.43; and B group 62.5 ± 2.03. ANOVA analysis has shown a significant result (p<0.05). Post-hoc analysis has shown that all groups are significantly different.

Conclusion: The intervention of orange water kefir can increase serum SOD activity in the hyperlipidemic rat.

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EFFECT OF ASPIRIN VERSUS CILOSTAZOL FOR INHIBITION OF PLATELET AGGREGATION IN TYPE 2 DIABETES MELLITUS PATIENTS (ESCORT DM)

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Objectives: The role of aspirin in the primary prevention of cardiovascular disease in patients with diabetes is controversial. On the other hand, cilostazol is known to be effective in reducing various cardiovascular risks in diabetes. In the present study, we examined the antiplatelet activity and effects on lipid profile of aspirin and cilostazol in Korean patients with type 2 diabetes mellitus.

Materials and Methods: We randomly assigned the 116 patients with type 2 diabetes and one more major cardiovascular risk factors but no evident cardiovascular disease to receive aspirin at a dose of 100 mg or cilostazol at a dose of 200 mg daily. The primary efficacy outcome was the antiplatelet effects of aspirin and cilostazol at baseline and after taking each drugs for 14 days. We measured antiplatelet effects with the aspirin response units (ARU) using Verify now system and the rate of platelet aggregation (RPA, seconds) due to collagen, epinephrine using PFA-100. Secondary outcome was the change of lipid profile after taking each drug for 14 days, in the fasting state.

Results: The increase of ARU (-185±66 vs. -2±42, p<0.001) and the decrease of RPA (118±76 vs. 26±73 sec, p<0.001) were significantly greater with aspirin compared with cilostazol after 14 days. In cilostazol group, there was no significant change of ARU and RPA after 14 days. The prevalence of aspirin resistance was 7.5% by ARU≥550, and 18.9% by RPA<192s. Compared with aspirin, cilostazol treatment was associated with increased HDL cholesterol (3.5±6.2, p=0.065) and decreased triglyceride (19.3±47.2 vs. 6±78 mg/dL, p=0.139), but statically not significant.

Conclusion: After 14 days of treatment, in the present study, aspirin showed better antiplatelet effects with Verify now and PFA-100 system compared to cilostazol. However, there were favorable changes in triglyceride and HDL cholesterol only in cilostazol treatment group.

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EFFICACY OF INDONESIA HERBAL THERAPY FOR HYPERTENSION DISEASE

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Objective: This study aims to make a comprehensive review of the treatment of hypertension using herbs in Indonesia.

Materials and Methods: This literature review summarizes the literature on the treatment of hypertension with herbs in Indonesia which published in English from 2010 to 2019 with keywords, “herbs therapy of hypertension”. Then from the five journals obtained, the authors identified journals based on related abstracts and reviewed the selected journals.

Results: Several clinical research about Indonesian herbal to treat hypertension such as brewed rosselia and honey can lower the systolic blood pressure (p=0.008), but not the diastolic blood pressure (p=1.00), extract of celery leaves effectively lower the systolic (p=0.023) and the diastolic (p=0.021), tomato juice supplementation can lower systolic (p=0.000) and diastolic (p=0.000) blood pressure, the carrot juice can lower the blood pressure in elderly patient with hypertension (p=0.029).

Conclusion: Some Indonesian herbs are recommended for people with hypertension. Various kinds of herbal remedies in Indonesia can be used as an effective nonpharmacologic treatment.

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COMPARISON OF TIMI AND GRACE RISK SCORE AS MORTALITY PREDICTOR IN PATIENTS WITH NON-ST ELEVATION MYOCARDIAL INFARCTION DURING HOSPITALIZATION

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Objective: As a developing country, Indonesia faces double burden of disease, with cardiovascular diseases one of the conditions with not only emerging epidemics but also mortality rate, a problem that is currently being faced by many countries worldwide, both low- or middle-income countries and developed ones. One way to help clinicians predict mortality risk is by using scoring systems. This study was conducted to compare the significance of two of the most-widely used risk-scoring systems, the TIMI and GRACE, in predicting mortality of Non-ST Elevation Myocardial Infarction (NSTEMI) patients, particularly during hospitalization at Dr. M. Djamil Hospital Padang, Indonesia.

Materials and Methods: This study was an analytic, cross-sectional study. The subjects were 108 patients, divided into two groups: 16 NSTEMI patients with hospital mortality, and 92 without. They were taken using non-probability consecutive sampling technique. Data were obtained from patients’ (of both groups) medical records and analyzed using the Kolmogorov-Smirnov test and logistic regression.

Results: From this study, GRACE Score is proven significant (p=0.001) in predicting in-hospital mortality cases, whereas there is no significant impact of TIMI Score (p=0.171). From the logistic model, it could be concluded that the significance is higher in the high- and low-risk groups compared to moderate-risk group. The results were due to lack of predicting variables in the more-practical TIMI Score that were recommended by previous studies to be assessed in predicting mortality. GRACE Score is considered to have variables that are more complete and complex, yet still has good utility in every-day practice.

Conclusion: In conclusion, it is advised for systematic evaluation of NSTEMI patients to be done, as a part of ensuring early detection of mortality risk factors, during hospitalization in particular. Further studies regarding comorbidities and complications should be conducted, since those might be an important factor in increasing mortality risk, as discovered in this study as well.

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**BODYPACK OVERVIEW**

**ICoLA 2019 by KSoLA**

**Program at a Glance**

- **Friday, September 6, 2019**
  - 09:40 - 11:10: SYMPOSIUM 1 (K) SYMPOSIUM 2
  - 12:10 - 13:10: LUNCHEON
  - 14:00 - 15:30: SYMPOSIUM 1
  - 13:50 - 14:00: BREAK
  - 11:20 - 11:30: OPENING ADDRESS
  - 16:30 - 18:00: LUNCHEON

**PRESENTATION**

The Benefits of GLP 1-RA and SGLT2 Inhibitor for the CV Outcomes: What is Similar or Different?

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**Materials and Methods:** This population-based retrospective study identified 44,767 (18-45 years old) Central-Jakarta residents (10% of the total population) who consecutively visited primary health care and community-based integrated health centers. We obtained data of (PH) and family history (FH) of determinants including smoking, diabetes mellitus (DM), stroke, CAD, hypertension (HT) and dyslipidemia using standardized protocol and statistically analyzed using SPSS.

**Results:** The prevalence of premature CAD was 0.5%. According to BMI-based groups, multivariate analysis showed that FH of CAD in group 1 (BMI <23 kg/m²) had higher odds of premature CAD (OR=19 vs OR=7.8, p<0.0001) compared with group 2 (BMI ≥23 kg/m²). Among group 1, males with FH of CAD had higher odds compared with the female (OR=44.3 vs 10.3, p<0.0001). Subjects in group 1 with a PH of HT had higher odds compared with group 2 (OR=8.2 vs 4, p=0.0001). In group 1, the odds was higher in the female with PH of HT compared to male (OR=8.5 vs 3.5, p<0.0001). Odds of premature CAD was higher in group 2 with a PH of DM in comparison to group 1 (OR=6.5 vs 3.4, p<0.0001). Among group 2, males with PH of DM had greater odds compared with the female (OR=8 vs 5.2, p<0.0001).

**Conclusion:** The premature CAD was accounted for 0.5%. FH of CAD, PH of DM and HT were independent determinants of premature CAD among the young adult population of Central-Jakarta, Indonesia. The odds of each determinant were significantly different across BMI and sex. Therefore, public health intervention engaging the community has to be maximized.

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**THE ASSOCIATION BETWEEN BLOOD UREA NITROGEN (BUN) AND CREATININE LEVELS WITH MORTALITY LEVELS OF CORONARY ARTERY DISEASE PATIENTS IN ICCU OF YOGYAKARTA HOSPITAL**

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**Objectives:** Coronary Artery Disease (CAD) is the leading cause of mortality in the world. Laboratory tests used most often in CAD patients are blood urea nitrogen (BUN) and creatinine. High BUN and creatinine levels may indicate kidney failure, increase the severity of CAD, and mortality risk. This study investigates the association between high BUN and creatinine levels with an in-hospital mortality rate of CAD patients.

**Materials and Methods:** We performed a retrospective cohort study by using secondary data of medical records from CAD patients hospitalized in ICCU of Banyumas, Wijayakusuma, and PDHI Hospital. Patients grouped into high BUN (>20 mg/dl) and normal (7-20 mg/dl) as well as high creatinine (>1.2 mg/dl) and normal (0.7-1.2 mg/dl) all represented as nominal data. The state of patients categorized into passed away and alive. Creatinine and BUN levels admission were analyzed with Chi-Square tests.

**Results:** We collected 92 medical records from 2012 to 2019. There were 46 male and 46 female patients, the youngest was 36 years old whereas the oldest was 89. We found that the lowest BUN level was 1 mg/dl while the highest was 208.6 mg/dl. The average BUN was 43,819 mg/dl in the high group and 13,976 mg/dl in the normal group. The lowest creatinine level was 0.21 mg/dl while the highest was 10.27 mg/dl. The average creatinine was 2,367 mg/dl in high creatinine group and 0.877 mg/dl in normal group. Study shows that high BUN and creatinine levels have no significant association (P= 0.694 & P=0.421, respectively). However, there is a significant association between BUN and creatinine levels with mortality of CAD patients (P=0.001 & P=0.001). There were 6 patients died in hospital and four of them are in high BUN and creatinine group.

**Conclusion:** There is a significant association between BUN and creatinine levels with a mortality rate of CAD patients.

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**P029**

**EFFECT OF METABOLIC SYNDROME IN PATIENTS WITH STEMI**

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**Objectives**: Metabolic syndrome (MS) is cluster of risk factors which precedes type 2 diabetes mellitus (DM) and it is associated with increased risk of CV diseases. Patients with AMI are often has MS but its relationship with outcome is unclear. In this study, we aimed to reveal association between MS and in-hospital outcome in patients with STEMI.

**Materials and Methods**: We selected patients with STEMI who treated by primary PCI. Diagnosis of MS was made according to the NCEP ATP III criteria. Peak CK-MB was used to determine infarct size. In-hospital HF was defined by Killip classification.

**Results**: A total of 542 patients with STEMI were included and prevalence of MS was 22.5% (n=122). The infarct size in MS group is significantly larger than non-MS group (168 IQR [64; 308] vs. 92 IQR [31; 236], p=0.002). Also LV diastolic function as assessed by E/e’ ratio was significantly impaired in MS group compared with non-MS group (16±8.3 vs. 13±6.8, p<0.001). However, LV systolic function was same in both group (LVEF 49.6±13.6% vs. 50.9±12.6%, p=0.312). Occurrence of in-hospital HF is significantly higher in patients with MS (32% vs. 23.1%, p<0.05). In univariable logistic regression, patients with MS were had 1.56 times increased probability of in-hospital HF (OR=1.56, 95% CI 1.00-2.44, p<0.05) after STEMI. After adjustment of age, peak CK-MB, LAD culprit vessel, culprit artery final TIMI flow, LVEF and E/e’ ratio, MS is independent predictor of in-hospital HF in patients with STEMI (OR=1.64, 95% CI 1.02-2.63, p<0.05). Within 5 components of MS, blood pressure was major determinant of in-hospital HF (OR=1.65, 95% CI 1.11-2.46, p<0.05).

**Conclusion**: MS in patients with STEMI is associated with larger infarct size, impaired LV diastolic function and poor in-hospital outcome. Among components of MS blood pressure is main determinant of development of in-hospital HF.

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**P030**

**30 DAYS READMISSIONS AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ST ELEVATION MYOCARDIAL INFARCTION**

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**Objectives**: The implementation of primary percutaneous coronary intervention (PCI) has significantly improved the clinical outcome of patients, but some patients still developed recurrent adverse events, with a negative impact on survival. Accordingly, Unplanned Re-Hospitalizations (RHS) following PCI carry significant burden to both patients and the local health care economic.

**Materials and Methods**: This study is descriptive retrospective study based on medical record data of patient who undergo PCI from March 2018 until March 2019 in Awa Bros Hospital Tangerang Indonesia. We studied about 30 days of RHS in ST elevation myocardial infarction patients after primary PCI, for the reasons predictors for unplanned cardiac and noncardiac RHS.

**Results**: Totals 181 patients, unplanned cardiac in 122 patients (67%) and noncardiac RHS occurred in 59 patients (33%), respectively at 1 year. The most frequent reasons for unplanned cardiac RHS were recurrent chest pain without evidence of ischemia (20.4%), recurrent chest pain with ischemia and coronary intervention (16.9%), and ischemic events (16.9%). Unplanned noncardiac RHS occurred most frequently attributed to bleeding (24.5%), infections (14.3%), and Stroke (9.1%). On multivariate analysis, left ventricular ejection fraction (22% increase in the rate of RHS per 10% decrease; P=0.03) and angiographic myocardial infarction Syntax score (34% increase per 10-point increase; P=0.01) were independent predictors of unplanned cardiac RHS. Age emerged as the only independent predictor of unplanned noncardiac RHS.

**Conclusion**: Among ST elevation myocardial infarction patients undergoing primary percutaneous coronary intervention in the setting of a randomized clinical trial, unplanned cardiac RHS occurred in 16% with recurrent chest pain being the foremost reason. Unplanned noncardiac RHS occurred in 8% with bleeding as the leading cause. Left ventricular ejection fraction and Syntax score were independent predictors of unplanned cardiac RHS and identified patient subgroups in need for improved secondary prevention.

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ASSOCIATION OF IL-6 RS1800795 & IL-4 RS2243250 GENE POLYMORPHISMS AND THEIR CIRCULATING LEVELS WITH RISK MARKERS OF CAD IN NORTH INDIAN POPULATION

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Objectives: Interleukins are regulatory proteins which play an important role in gene regulation. Interleukin-6 (IL-6) and interleukin-4 (IL-4) are inflammatory cytokines and showed association with severity of coronary artery disease (CAD). The promoter gene polymorphism of cytokine genes have been shown to increase transcriptional activity of particular gene. So, in the present study, we have investigated the role of IL-6 174 G/C (rs1800795) & IL-4 589 C/T (rs2243250) polymorphism in development of CAD

Materials and Methods: The gene polymorphism of IL-6 174 G/C and IL-4 589 C/T has been studied in 301 diagnosed CAD subjects (Age 51.50± 9.28; BMI 25.30± 3.58) and 305 healthy controls (Age 51.57± 9.50; BMI 24.06 ± 7.26). These polymorphism of IL-6 and IL-4 were detected by real time PCR by using Taqman SNP genotyping assay and serum concentration of IL-6 and IL-4 levels were measured by ELISA

Results: This is a case control study and data of present study revealed that IL-6 -174 G/C gene polymorphism was found significantly associated with the susceptibility of CAD. Variant genotype GC+CC (dominant model) (p=0.005: OR=1.79: 95% CI= 1.21-2.68) and variant allele C (p=0.002: OR=1.42: 95% CI= 1.13-1.78) of IL-6 -174 G/C gene was observed significantly higher in study population as compared to controls. Moreover we did not find any association in case of IL-4 589C/T gene polymorphism with CAD

Conclusion: The data of present study concludes that IL-6 -174 G/C gene polymorphism may affect their circulating levels which are ultimately caused coronary artery disease in north Indian population.

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LONG-TERM BENEFIT AND WITHDRAWAL EFFECT OF STATIN AFTER PERCUTANEOUS CORONARY INTERVENTION: A NATIONWIDE POPULATION-BASED COHORT STUDY

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Objectives: Despite the indubitable evidence for benefit of statins after PCI, longitudinal studies are still limited, and there have been concerns that statin discontinuation may cause negative effects called “statin withdrawal syndrome”. The study aimed to determine the long-term benefit and withdrawal effect of statins in patients undergoing percutaneous coronary intervention (PCI).

Materials and Methods: We conducted a retrospective cohort study using the nationwide health insurance claim data in Korea. A total of 7193 patients who underwent PCI between 2002–2013 were included. The primary outcome was the composite outcome of myocardial infarction, stroke, and all-cause death.

Results: The mean follow-up period was 4.07 ± 3.07 years, 1529 (21.3%) patients experienced a primary outcome. “Current statin use” was significantly associated with lower risk (adjusted HR 0.61 [95% CI, 0.54–0.69]) compared with “no current use”. Beneficial effects of statins were constant throughout the follow-up period. Compared with ‘no recent use of statin within 30 days’, ‘statin withdrawal’ (withdrawal of statin within 30 days) were at increased risk (adjusted HR 1.47 [95% CI, 1.20–1.80]). With respect to the intensity of statin associated with withdrawal, dose dependent increased risk was observed (adjusted HR [95% CI] for withdrawal of low-, moderate-, and high-intensity statin were 1.03 [0.53–2.03], 1.46 [1.18–1.81], 2.41 [1.34–4.34]).

Conclusion: The beneficial effect of statin was constant throughout the long-term follow-up period after PCI. There was an increased cardiovascular risk during the statin withdrawal period, especially with the use of high-intensity statin.

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Cerebrovascular Disease / Renovascular Disease

**P033**

**SEX DIFFERENCES IN SHORT-TERM OUTCOME AMONG ISCHEMIC STROKE PATIENTS WITH DIABETES: WOMEN HAD POORER FUNCTIONAL RECOVERY**

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**Objectives**: Diabetes is a major risk factor of acute ischemic stroke. In general stroke population, patients with diabetes had poor outcomes, and women had more clinical severity and poor functional outcomes compared with men. There are a number studies examined sex differences in stroke outcomes in general, but not in a population of strokes with diabetes. Immediate functional outcome, and a short-term within one month after stroke was not known. We examined whether ischemic stroke women and men with diabetes had differences functional outcome at one-month post stroke.

**Materials and Methods**: All patients with acute ischemic stroke (N = 3,135) admitted to a tertiary care, teaching, and referral hospital the south of Thailand, from October, 2011 to February, 2016, were reviewed. There were 753 known diabetes (50.1% women, n=368 vs 49.9% men, n=499). Functional outcome was assessed by using modified Rankin Scale (mRS). Score of 3 and above indicated poor functional outcome. Independent t-test, Chi-square, and odds ratio (95%CI) were employed to compare sex differences.

**Results**: Women had higher mRS score at discharge (1.97±1.78 vs 1.58±1.73, p=0.004), and at one-month follow up (1.52±1.87 vs 1.02±1.45, p=0.003) compared with men. More women than men had higher score on mRS at discharge (Chi-square 18.31, p=0.003), and at one-month (Chi-square 17.09, p=0.009). Poor recovery rates were more tend in women at discharge (54% vs 46.0%, OR 1.12, 95%CI 0.97-1.30), and at one-month (57.7% vs 42.3%, OR 1.22, 95%CI 0.98-1.49) compared with men. One-month mortality rates in women was higher than men (11.7% vs 6.8%, OR 1.30, 95%CI 0.99-1.69).

**Conclusion**: There were sex differences in a short-term functional recovery of ischemic stroke with diabetes. Women were more likely had poor functional outcome during one-month post stroke. This finding warrants further research explored diabetes-related factors on sex differences in function outcome after strokes.

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**P034**

**SOX17 REGULATES BLOOD-BRAIN BARRIER INTEGRITY IN HYPERTENSIVE CONDITIONS**

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**Objectives**: Blood-brain barrier (BBB) featuring mature brain vessels is critical for homeostasis of neurons in the brain by limiting the entrance of toxins and pathogens. While the formation and maturation of BBB has been elucidated fairly well, the mechanism how BBB is maintained during adulthood remains elusive. The transcription factor Sox17 which is important for early vascular development, shows robust expression in brain capillary endothelial cells in the adult BBB. To reveal the role of Sox17 in adult brain capillaries, we excised Sox17 from endothelial cells in adult mice.

**Materials and Methods**: For inducible Sox17 deletion in endothelial cells, Sox17flox/flox mice were intercrossed with Cdh5(PAC)-CreERT2 transgenic mice. Osmotic minipumps were implanted to increase blood pressure via subcutaneous infusion of angiotensin II.

**Results**: Endothelial cell-specific deletion of Sox17 strikingly increases BBB permeability in hypertensive conditions induced by chronic infusion of angiotensin II in adult mice. Immunofluorescence staining shows downregulation of tight junction proteins and upregulation of plasmalemma vesicle associated protein (PLVAP) which reflects the increase of transcytosis in Sox17-deficient hypertensive conditions. Electron microscopy analyses show the increase of vesicular activity and loosening of tight junctions in endothelial cells which confirms the immunostaining results.

**Conclusion**: Our study findings suggest the protective role of Sox17 in the regulation of BBB permeability against hypertensive stress.

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THE EFFECT OF BLACK SUGARCANE ETHANOL EXTRACT ON THE EXPRESSION OF BAX IN RAT’S DENTATE GYRUS POST-BILATERAL COMMON CAROTID ARTERY OCCLUSION (BCCAO)

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Objectives: Stroke is an ischemic condition where there is an interruption on the oxygen supply inside the brain that leads to cell death caused by overly-expressed Bax. Stroke causes several impairments inside the brain, including memory impairment. Black Sugarcane (Saccharum officinarum) could decrease the impairment incidents caused by stroke through the Bax expression regulation in the brain parts such as dentate gyrus. This study’s purpose is to know the effect of black sugarcane’s ethanol extract (Saccharum officinarum) on the Bax expression on the rats’ dentate gyrus after Bilateral Common Carotid Artery Occlusion (BCCAO); one of the methods used in a rat stroke model.

Materials and Methods: This is an experimental post-test control group study with 15 stored biological material from 3 months old Rattus norvegicus rats’ brain that had been grouped into the sham group (no BCCAO), BCCAO with sugarcane group (received both BCCAO and ethanol extract) BCCAO non-sugarcane group (received only BCCAO), continued by Immunohistochemistry (IHC) staining. Later, the Bax expression on each of the brains’ will be observed under a microscope then calculated using the Allred scoring method. The Bax data then checked using Shapiro-Wilk for the normality, followed by One-Way ANOVA and Post Hoc test to determine the significance among each group.

Results: The BCCAO non-sugarcane group shows the highest expression of Bax (Alred Score = 5.118), followed by sham group (Alred Score = 4.778) and BCCAO with sugarcane (Alred Score = 4.664) (p=0.05) There is a significant difference in the Bax expression in the BCCAO non-sugarcane group and BCCAO with sugarcane group (p=0.047, p<0.05)

Conclusion: It can be concluded that there is a relationship between the administration of black sugarcane ethanol extract and Bax expression in rats’ dentate gyrus, where black sugarcane ethanol extract could lower the Bax expression in rats’ dentate gyrus.

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Cardiometabolic Risk Factors and Biomarkers in Atherosclerosis

METABOLIC SYNDROME AS A COMMON CARDIOVASCULAR DISEASE RISK IN NORMAL WEIGHT HYPERTENSION: A MULTI-SITE SURVEY FROM 11 PRIMARY CARE SETTINGS IN SOUTHERN THAILAND

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Objectives: Metabolic syndrome (MetS) is a multi-complex risk of stroke and cardiovascular disease (CVD). Hypertension with MetS had at least threefold higher risk for developed CVD. Most of the previous studies examined MetS in obese, few studies in none-obese, but not in a population of hypertension. We determined the prevalence of MetS and metabolic components in normal weight (BMI < 23.0 kg/m2) hypertension.

Materials and Methods: Among 1,461 hypertensions attended 11 rural health care units in southern Thailand, 571 (39%) were normal weight. Data were obtained by structure interview, medical records, and by measurements of anthropometric, blood pressure, fasting plasma glucose, and lipid profiles. MetS was defined according to NCEP-ATP III criteria. Weight circumference was defined based on NCEP-APC criteria, a cut-off points of 80 cm in women and 90 cm in men indicated abdominal obesity.

Results: Prevalence of MetS was 54.8% in normal weight hypertension. Components of MetS were hypertension co-existed with hypertriglyceridemia (47.8%), HDL (47.3%), hyperglycemia (42.6%), and abdominal obesity (33.6%). All of these components were significantly attributed of MetS. Based on Logistic Wald values, MetS was strongly attributed by low HDL (Wald 190.52, RR 27.99, 95%CI 17.44-44.94), hypertriglyceridemia (Wald 183.81, RR 22.41, 95%CI 14.30-35.14), abdominal obesity (Wald 70.18, RR 4.81, 95%CI 3.33-6.95), and hyperglycemia (Wald 70.81, RR 4.81, 95%CI 3.33-6.95), respectively.

Conclusion: Over a half of normal weight hypertension had MetS. Common co-existed components were low HDL, hypertriglyceridemia, and hyperglycemia. This finding warrants further research explored cardiovascular event in this patient group, and clinical practice to prevent MetS in normal weight person.

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BILE ACID METABOLISM MEDIATES BETWEEN NONALCOHOLIC STEATOHEPATITIS AND CARDIOVASCULAR DISEASES
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Objectives: In our previous study, we demonstrated that nonalcoholic steatohepatitis (NASH) aggravates cardiovascular disease by Nω-Nitro-L-arginine methyl ester hydrochloride (L-NNAME) injection in SHRSPS/Dmcr rat. In the present work, we focused on bile acid (BA) metabolism as the intermediary factor that aggravates NASH and cardiovascular disease.

Materials and Methods: SHRSPS/Dmcr rats were divided into 3 groups, and fed with a high-fat and high-cholesterol (HFC) diet that included cholic acid (CA) of 0% (control), 2%, and 4% group. After 6 weeks of HFC diet feeding, we administered L-NNAME intraperitoneally. After 8 weeks of HFC diet feeding, we evaluated serum BA composition using LC-MS/MS, mRNA expression related to lipid synthesis (e.g., LXR and SREBP1c), and histopathological staining.

Results: SHRSPS/Dmcr rats were divided into 3 groups, and fed with a high-fat and high-cholesterol (HFC) diet that included cholic acid (CA) of 0% (control), 2%, and 4% group. After 6 weeks of HFC diet feeding, we administered L-NNAME intraperitoneally. After 8 weeks of HFC diet feeding, we evaluated serum BA composition using LC-MS/MS, mRNA expression related to lipid synthesis (e.g., LXR and SREBP1c), and histopathological staining.

Conclusion: The 4% CA group aggravated both hepatic fibrosis and myocardial ischemia. The serum BA level increased markedly in the 4% CA group. Additionally, mRNA expression related to lipid synthesis (LXR and SREBP1c) was upregulated in the liver. Differently, NFKB in the endothelial cells of the coronary artery was activated by BAs. Furthermore, VCAM-1 mRNA level was also upregulated. Interestingly, the animals in the 0% CA group, which demonstrated low serum BA, ameliorated hepatic fibrosis and myocardial ischemia. Unconjugated primary BAs of the group fed with 4% CA were markedly increased, by fractionated serum BA composition analysis, when compared to it of the group fed with 0% CA group. This results suggested that unconjugated BAs may aggravate hepatic fibrosis and myocardial ischemia.

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THE TRIGLYCERIDE GLUCOSE INDEX (TYG INDEX), SURROGATE MARKER OF INSULIN RESISTANCE AND CARDIOVASCULAR DISEASE: POPULATION-BASED STUDY
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Objectives: Background We evaluated the relationships between the triglyceride glucose index (TyG index), and CVD using a large-scale population dataset from the National Health Information Database (NHID).

Materials and Methods: We did a retrospective, observational, cohort study of 20,144,176 persons aged older than 20 years from 2009 to 2015 using NHID. We divided the subjects into quartiles groups based on TyG index. The incidence of CVD (non-fatal stroke, non-fatal myocardial infarction (MI), and CVD death) was assessed using the hazard ratios (HRs) estimated with cox proportional hazard modeling.

Results: During 5.4 years of mean follow-up period, stroke was diagnosed in 155,518 (0.77%) participants, MI in 125,194 (0.62%) and CVD death in 342,285 (1.7%). Multivariate-adjusted hazard ratios (HRs) for patients in highest quartile of TyG index were high er risk for stroke (HRs =1.271; 95% confidence intervals [CI] 1.25-1.193), for MI (HRs =1.34; 95% CI 1.315-1.365), and for death (HRs =1.174; 95% CI 1.161-1.186) compared with subjects in the lowest quartile of TyG index. These effects were independent of age, sex, smoking, alcohol drinking, physical activity, body mass index, systolic blood pressure, and total cholesterol.

Conclusion: In our study, TyG index, a simple measure reflecting insulin resistance, might be useful to early identify individuals at a high risk of developing a cardiovascular event.

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P039

HANDGRIP STRENGTH IS ASSOCIATED WITH RISK OF METABOLIC SYNDROME IN MIDDLE AGE AND OLDER ADULTS, NOT IN YOUNGER ADULTS: KNHANES 2017

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Objectives: Handgrip strength (HGS) has been introduced as a simple assessment tool for muscular strength, recently. The objective of this study was to investigate the independent relationship between HGS and the risk of metabolic syndrome (MetS) in Korean adults.

Materials and Methods: We analyzed data from 5,850 Korean adults aged ≥ 18 years from the Korea National Health and Nutrition Examination Surveys 2017. HGS was measured in dominant hand three times with 30 seconds of resting interval using a digital grip strength dynamometer. Absolute HGS was defined as average value of the three measurements, and relative HGS was defined as absolute HGS divided by BMI (HGS/BMI) or by body weight (HGS/Wt). The correlation between absolute or relative indices of HGS and various cardiometabolic parameters, each component of MetS, and risk of MetS was evaluated. MetS was defined according to the combined definition from the International Diabetes Federation (IDF).

Results: Absolute HGS, HGS/Wt and HGS/BMI were inversely correlated with age, BMI, blood pressure, and atherogenic lipid parameters. The number of components of MetS and the frequency of MetS were decreased with higher absolute or relative HGS. However, after controlling for age, gender, diabetes mellitus, hypertension, body mass index, and health related behaviors such as smoking status, heavy alcohol consumption, regular exercise, lowest quartile of HGS/BMI was associated with higher risk of MetS in adults aged ≥ 40 years, not in younger adults aged < 40 years. However, the relationship between absolute HGS and HGS/Wt ratio and the risk of MetS disappeared after adjusting for potential confounders in all population.

Conclusion: Our data suggest that relative HGS could be an independent predictor for MetS in middle age and older adults. Further researches are warranted to investigate the different role in younger population.

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Obesity / Sarcopenia / Aging

P040

CORRELATION BETWEEN VISCERAL FAT DEPOSITION WITH BODY AGE IN MEDICAL STUDENTS OF INDONESIAN AS A RARELY KNOWN

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Objectives: Fat is one of many important components in our body. In the metabolism process, fat has an ability to deposit itself, including subcutaneous fat deposition and visceral fat deposition. The increase in a visceral fat deposition may elevate the risk of cardiovascular disease. The body age in humans can be determined by the presence of fat deposition in several tissues like the heart and liver. The purpose of this study is to determine the correlation between visceral fat deposition and body age.

Materials and Methods: This study used a cross-sectional method. The subject of this study come from 23 medical student’s of Universitas Islam Indonesia, which consist of 12 male and 11 female. This study uses a karada scan to measured visceral fat deposition and body age at the body. The normality test has been done using the Shapiro-Wilk method and the correlation coefficient test using Spearman’s correlation to determine the correlation between correlation visceral fat deposition with body age.

Results: Correlation between visceral fat with body age was carried out with SPSS software. With this software, we get the result if any significant correlation between visceral fat with body fat, Spearman Correlations Coefficient p < 0.898 and Shapiro-Wilk evidence p < 0.002.

Conclusion: The visceral fat deposition has a strong correlation with the body age, that showed at this study. A person with a high visceral fat deposition has an old body age. A comprehensive and high competition necessary to prevent any visceral fat deposition to increase body health index and make a healthier civilization.
P041

OBESITY, AGEING AND ATHEROSCLEROSIS-UNDERSTANDING THE ASSOCIATION AND COMMON RISK FACTORS-AN EXPLORATORY STUDY

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Objectives: Changing lifestyle has shifted the paradigm to non communicable diseases and a substantial proportion of these deaths are due to cardiovascular diseases (CVDs). Over 80-90% of all the cardiovascular diseases in the world occur in low income and middle income countries, with high burden in India Of all the causes; Obesity and ageing play an important risk factor role in the natural history of CVDs. Ageing being a non modifiable risk factor; the onus of prevention should shift towards reducing obesity. Aim of the study was to explore the interrelationship between obesity, ageing and CVDs amongst youth.

Materials and Methods: The study was an exploratory cross sectional study carried out in 257 participants among youth (aged 15 to 29 years, as per Ministry of statistics, Government of India) randomly selected from schools, colleges and industries. The study tool was a self-designed, 20 items pre-validated structured questionnaire, including both closed and open ended questions. Clinical examination estimating anthropometric measures was also recorded.

Results: Majority (59%) of the participants had BMI in the range of 19 to 25 and 20% had BMI ≥25. Mean knowledge score amongst participants with BMI 19 to 25 was higher (78.21+23.12;CI.95%) compared to others (69.23+18.7 ;p=0.044).Nearly 54% participants were aware that they were entering into obesity and that it would lead to CVDs; 72% agreed that exercise helps in overcoming obesity and future incidence of CVDs. More alarmingly 89.5% of the respondents did not take any steps to overcome obesity/or were delaying exercise and 69% were unaware about relationship of ageing with CVDs.

Conclusion: The study gives an insight towards the basic level of understanding and shows that a wide lacunae exists amongst youth concerning the most prevalent yet preventable diseases i.e. CVDs. Health Promotive and Preventive strategies may provide cost-effective approach in preventing CVDs.

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P042

EFFECT OF SYNBOTIC DRINK OF STELECHOCARPUS BURAHOL WITH LACTOBACILLUS CASEI AND LACTOBACILLUS PLANTARUM ISOLATES ADDITION ON BODY WEIGHT OF RATS (RATTUS NORVEGICUS) INDUCED HIGH-FAT DIET

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Objectives: This research aims to know the effect of a symbiotic drink of Kepel (Stelechocarpus burahol) with the addition of Lactobacillus casei and Lactobacillus plantarum on body weight of rats induced by high-fat diet.

Materials and Methods: This research used pretest and posttest randomized control group design. Fifteen rats divided into 3 groups. The negative control group and interfered group fed by 20 grams of high-fat diet ad libitum for a month. While the positive control fed by standard diet. Simultaneously, the interfered group also was given symbiotic drink at the dose 1% of body weight every day orally. The body weight was examined before and after all of the intervention. ANOVA with bonferroni post-hoc test was used in statistical analyzing.

Results: The body weight (gram) before the intervention were 217.60 ± 17.94 for positive control group, 192 ± 34.28 for negative control group, and 217.20 ± 18.47 for the interfered group. After a month intervention the body weight were 264.40 ± 13.87 for positive control group, 289 ± 21.31 for negative control group, and 278.40 ± 20.53 for the interfered group. There were no significant differences in body weight between each group after a month intervention. However, the interfered group had lower increasing of body weight compared to negative control group.

Conclusion: One month intervention of the symbiotic drink of Kepel with the addition of Lactobacillus casei and Lactobacillus plantarum isolates are not effective enough to prevent the increasing of body weight.

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P043
METABOLIC SYNDROME OF TREATMENT IN HYPOCALORIC DIET EXOGENOUS CONSTITUTIONAL OBESITY

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Objectives : To optimize diagnosis and treatment of metabolic syndrome in adolescents with exogenously-constitutional obesity

Materials and Methods : We Selected 29 adolescents with exogenously-constitutional obesity of varying seventy were examined the average age was 13.0-2.6 years living in Bhaktapur Nepal diagnosis of the metabolic syndrome was carried out on the basis of diagnostic criteria IDF 2008.the risk of developing the metabolic syndrome was calculated using the computer program developed around the waist circumference in children and adolescents of the Nepali population. The treatment was carried out using a hypocaloric diet developed for children and adolescents depending on the age talking into account the national cuisine.

Results : In assessing the components of the metabolic syndrome of children and adolescents with exogenously constitutive obesity, WC>90 and BMI >97 percentiles were found in all 29 subject metabolic syndrome is diagnosed in 6 (24.0%) adolescents 10-16 years with exogenously-constitutional obesity. violation of carbohydrate metabolism(fasting glycemia)5.0mmol l was detected in 3 (10.3%) of the examined. an increase in blood pressure above the IDF criterion (SMP>130/DBP 85 mmhg ) was detected in 3 (10.3%) patients. Dyslipidemia in particular. Hypertriglyceridemia in 4 (13.8%) a decrease in high density lipoproteins <1.03mmol/L was detected in 6 (20.7%) against the background of hypocaloric diet after correction of diet and lifestyle the normalization of fasting glycemia in 2 (6.9%) the level of triglycerides decreased by half the level of high density lipoproteins also increased 2 fold after 3 months all subject had normal hemodynamic index.

Conclusion : Our study initial metabolic syndrome was diagnosed in 6 (24.0%) against a background of lifestyle correction and a hypocaloric diet developed in 2 of them the metabolic syndrome was not diagnosed.

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P044
INVESTIGATION OF INHIBITORY POTENTIAL OF DIETARY PHENOLICS QUERCETIN AND ELLAGIC ACID TO PYRUVATE DEHYDROGENASE KINASE 3: A NEWER THERAPEUTIC APPROACH TOWARDS CANCER AND METABOLIC SYNDROME

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Objectives : Pyruvate dehydrogenase kinase 3 (PDK3) is a mitochondrial protein, has recently been considered as a potential drug target for varying types of cancer, diabetes and other metabolic syndromes. In melanoma, suppression of the HIF-1α/PDK3 signaling drives metabolic shift from glycolysis to mitochondrial oxidative metabolism. Thus, targeting PDK3 is considered for drug design for cancer, diabetes and for myocardial ischemia with the potential effects on metabolic shifts. Objective of this work is to exploit anticancer properties of ellagic acid and quercetin via PDK3 inhibition.

Materials and Methods : We have investigated the binding mechanism of ellagic acid and quercetin to the PDK3 by using molecular docking, simulation, fluorescence and isothermal titration calorimetric assays. We further performed enzyme inhibition assay of PDK3 followed by cell cytotoxicity and viability assays to understand the underlying mechanism of PDK3 inhibition and further therapeutic implications.

Results : Both ellagic acid and quercetin interact to the important residues of active site cavity of PDK3 in a well-organized fashion. The stability of quercetin-PDK3 complex is maintained by significant numbers of non-covalent interactions throughout the simulation trajectories. Both fluorescence and isothermal titration calorimetric assays show an excellent binding affinity of ellagic acid and quercetin to the PDK3 along with enzymatic activity inhibition (IC50 values in μM range). Interestingly, both ellagic acid and quercetin are non-toxic to normal cell lines (HEK-293) and significantly inhibits the proliferation of cancer (HepG2 and AS49) cell lines.

Conclusion : All these observations clearly indicate that ellagic acid and quercetin may further be exploited as promising therapeutic inhibitor for PDK3 to ameliorate associated cancer with required modifications and in vivo validation. This approach will also be useful in the designing of drugs and their target selectivity as potent inhibitors of PDK3 for combating against cancer and act as therapeutics for metabolic reprogramming.

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THE IMPACT OF NAFLD AND WAIST CIRCUMFERENCE CHANGE ON THE DEVELOPMENT OF DIABETES IN SUBJECTS WITH PREDIABETES

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Objectives: Nonalcoholic fatty liver disease (NAFLD) and prediabetes are well-known risk factors for diabetes. However, the risk of diabetes in subjects with prediabetes in the presence of NAFLD remains unclear. Furthermore, the effect of waist circumference (WC) change on the development of diabetes is still elusive. In the present study, we investigated the association of NAFLD with diabetes and the effect of WC change in subjects with prediabetes.

Materials and Methods: In this retrospective cohort study, we enrolled 6240 subjects with prediabetes who underwent general routine health evaluations in 2007 and revisited the clinic for follow-up examinations in 2008–2013 at least one time. Subjects were stratified by WC changes into three groups. The relative risks (RRs) for diabetes according to the presence of NAFLD and WC change were evaluated.

Results: The prevalence of NAFLD in study subjects was 45.4% (2830 / 6240). During the follow-up, the total incidence of diabetes was 8.1% (505 / 6240). Subjects with NAFLD had a higher incidence of diabetes and the adjusted RRs were 2.18 [95% confidence interval (CI), 1.78 to 2.67]. The adjusted RRs were related to WC changes. The multivariate-adjusted RRs for diabetes according to WC change (-1.0 cm, -1.0 to 1.0 cm, and > 1.0 cm) were 1.92 (95% CI, 1.17 to 3.17), 2.07 (95% CI, 1.39 to 3.06), and 2.22 (95% CI, 1.69 to 2.91), respectively, after adjustment for age, smoking, drinking alcohol, BMI, WC, ALT, and hypertension.

Conclusion: There was a significant association between NAFLD and diabetes in subjects with prediabetes, and this association was closely related to WC changes.

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EFFECTIVITY OF LIRAGLUTIDE AS NEW ADJUVANT THERAPY FOR LOWERING WEIGHT LOSS AND FAT DISTRIBUTION: AN EVIDENCE-BASED META-ANALYSIS

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Objectives: This study aims to determine whether an equal degree of weight loss by liraglutide or lifestyle changes has a different impact on subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) in obese subjects with prediabetes.

Materials and Methods: The study is a literature review of scientific article through several online database, including PubMed and Clinical Key using keywords related to the clinical query.

Results: The articles were obtained (Clinical Trial and Randomized Controlled Trial). Both articles were valid with detailed outcomes: Sixty-two metformin-treated obese subjects with prediabetes were randomized to liraglutide (1.8 mg/day) or lifestyle counseling. Changes in SAT and VAT levels (determined by abdominal MRI), IGF-II were assessed before and after a comparable weight loss (7% of initial body weight). After a comparable weight loss was achieved by 20 patients per arm, a reduction in VAT was significantly seen higher in the liraglutide arm than in the lifestyle arm (P = 0.028). No differences were observed in SAT reduction (P = 0.64). IGF-II serum level was significantly increased (P = 0.024) only with liraglutide administration, and the increase in IGF-II level was correlated with both a decrease in VAT (p = -0.435, P = 0.056).

Conclusion: Liraglutide effects on visceral obesity provide a rationale for using this molecule in obese subjects in an early phase of glucose metabolism dysregulation natural history.

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P047

VISCERAL FAT AND FORCED VITAL CAPACITY IN YOUNG ADULT: A CROSS-SECTIONAL STUDY AMONG INDONESIAN YOUNG ADULT

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Objectives: Several experimental studies have explained a positive correlation of pulmonary function disorders in metabolic syndrome. Metabolic abnormalities can lead to death. Metabolic abnormalities can be explained by visceral fat. We hypothesize that visceral fat can affect pulmonary function in young adults.

Materials and Methods: We conducted a cross-sectional study involved 21 participants aged between 18-20. The amount of visceral fat was determined by a karada scan and pulmonary function (FVC) by spirometry. The association between visceral fat and value of FVC were assessed with Spearman. the difference in the distribution of variables was evaluated with Shapiro-Wilk.

Results: 21 subjects were included in this analysis. The data doesn’t have a significant correlation. It shows that visceral fat in young adult was not found to be associated with forced vital capacity by (P<0.167).

Conclusion: The results from these studies are that the amount of visceral fat is not affecting pulmonary function in young adults, especially to the FVC. It means, how much the amount of lipid that stored within an abdominal cavity in a young adult will not affect the value of FVC. To minimize the result with no significant data, we suggest taking more samples.

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P048

MORINGA ROOTS EXTRACT (MORINGA OLEIFERA, LAM.) LOWERING URIC ACID LEVEL IN HIGH FAT DIET AND STREPTOZOTOCIN-NICOTINAMIDE INDUCTION WISTAR RAT (RATTUS NORVEGICUS) MODEL

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Objectives: Increasing of uric acid level is recognized as risk for cardiovascular disease especially atherosclerosis by several ways such as endothelial dysfunction, platelet adhesiveness, oxidative metabolism, and inhibit nitric oxide production. Moringa oleifera contains phenolic compounds includes phenolic acids, flavonols, tannins that have antioxidant activity to decrease uric acid level. This study aimed to investigate the effect of Moringa Oleifera root extract to uric acid level in high fat diet and streptozotocin-nicotinamide induction wistar rat model

Materials and Methods: This laboratory experimental using pretest posttest control group design. Sample used are thirty healthy young adult male wistar rat (weighed 150-200 gr, aged 2-3 months). The rats were randomly divided into five groups: negative control (G1), positive control (G2), given moringa roots extract at dose 150 mg/kgBB (G3), 250 mg/kgBB (G4), 350 mg/kgBB (G5). G1 were fed with standard pellet. G2, G3, G5, and G5 were fed with high fat diet for 28 days first and streptozotocin nicotinamide intraperitoneal injection at day 25. Administration of moringa roots extract was given at day 29 until day 56. Measurement of uric acid level using spectrophotometer DiaSys kit at day 2, 25, 28 and 57. Analysis technique using shapiro-wilk test continued with repeated anova and bonferroni test, oneway anova and Tukey HSD.

Results: Repeated anova test showed significant difference results (p<0.05) for day 0, 25, 28, 57 to all groups, whereas bonferroni test showed significant difference results (p<0.05) in G2, G4 and G5. One way anova test (p=0.000) and Tukey HSD test of uric acid level showed that there were significant differences (p<0.05) between each group after given by moringa roots extract

Conclusion: Moringa Roots Extract at dose 150 mg/kgBB, 250 mg/kgBB, and 350 mg/kgBB could reduce uric acid level significantly in high fat diet and streptozotocin-nicotinamide induction wistar rat model

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P049

EFFECT OF GIVING AN ETHANOLIC EXTRACT OF MORINGA OLEIFERA, LAM. ROOT TO THE LEVELS OF SGPT IN WHITE MICE (RATTUS NORVEGICUS) METABOLIC SYNDROME MODEL

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Objectives: Knowing the presence or absence of the effect of Moringa oleifera, Lam root extract on SGPT levels of white rat (Rattus norvegicus) metabolic syndrome models.

Materials and Methods: This study used a laboratory experimental method with a pretest-posttest control group design. The research was conducted at the Central Food and Nutrition Laboratory of Gadjah Mada University, Yogyakarta, Indonesia. The research subjects were male white rats (Rattus norvegicus) Wistas strain aged 2-3 months with a body weight of 150-200 grams. The number of samples was 30 rats divided into 5 groups, each group consisted of 6 rats. SGPT measurement was carried out three times, after the adaptation stage, after induction of hyperglycemia hyperlipidemia, and after giving an ethanolic extract of Moringa oleifera, Lam. Data analysis of SGPT levels using the Shapiro-Wilk test to determine the normality of data distribution. To find out the degree of significance of the data using a paired T test if the data is normally distributed and the Wilcoxon test if the data is not normally distributed.

Results: There was a decrease in SGPT levels of 6.31 U/L at Moringa oleifera, Lam. root dose of 150 mg/kg; 11.73 U/L at a dose of 250 mg/kg; and 15.78 U/L at a dose of 350 mg/kg.

Conclusion: Moringa oleifera, Lam root extract can significantly reduce SGPT levels of white mice (Rattus norvegicus) metabolic syndrome models.

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P050

THE INVERSE ASSOCIATION BETWEEN LIPOPROTEIN (A) CONCENTRATION AND METABOLIC SYNDROME

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Objectives: Lipoprotein (a) [Lp(a)] is a low-density lipoprotein like particle which has proatherogenic and prothrombotic properties. Therefore, increased Lp(a) levels have been reported to be associated with a higher cardiovascular risk. However, the association between Lp(a) and metabolic syndrome (MetS) is still controversial. This study aimed to examine the association between Lp(a) levels and presence of MetS.

Materials and Methods: A total of 10,150 Korean participants (men: 60.5%, mean 51.6 years) who underwent the health checkup in 2006-2013 were included in this cross-sectional study. MetS was defined using a revised National Cholesterol Education Program definition, which adopted an Asian-specific waist circumference threshold suggested by the International Diabetes Foundation. Logistic regression analyses were performed to determine the significance of the association between baseline Lp(a) levels and the presence of MetS.

Results: The overall prevalence of MetS was 7.1% and the proportion of the participants with MetS decreased across the Lp(a) quartiles (p for trend <0.001). In a multivariate model, the highest quartile of Lp(a) levels (>37.0 mg/dL) was significantly associated with a reduced risk of MetS (odds ratio [OR] 0.63, 95% CI: 0.49–0.80; p for trend <0.001) compared with the lowest quartile (<12.2 mg/dL). When we analyzed log-transformed Lp(a) level as continuous variables, elevated Lp(a) level was also associated with a lower MetS risk. Serum Lp(a) levels inversely correlated with waist circumference, body mass index, blood pressure, fasting glucose, insulin, index of insulin resistance, and the number of MetS components, while it correlated positively with C-reactive protein. A greater number of MetS components had lower Lp(a) levels as well.

Conclusion: Serum Lp(a) level showed a significant inverse correlation with MetS prevalence and individual components of MetS.

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RESEARCH ON HEALTH AND METABOLIC FUNCTION RISK OF HOME CARE WORKERS IN REGIONS OF SOUTHERN TAIWAN

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Objectives: To realize the health status, physical fitness data of the home care workers was measured and analyzed in this study.

Materials and Methods: Metabolic function, physical fitness and a series of physiological detections were tested. A total of 175 home care workers (145 of whom were women) aged 21-68 years were recruited and measured in this study.

Results: The scores of the Role Emotion of SF-36 lifestyle scale, and most of the proposed physiological data (e.g., height, weight, waist circumference, systolic blood pressure, RBCs, Hb, etc.) were significantly higher in males than females. However, the opposite effects of the platelet count and HDL-C were observed between the two groups. Moreover, when the dependent variables were compared among different age groups, lower WBC, Hb, platelet count, and urea nitrogen were shown in the 51-60 compared to the 21-30 age group. Regression analysis based on hand grip strength showed that factors affecting hand grip included not only height and weight, but also the albumin, creatinine and triglyceride. Relative grip strength was significantly correlated with the BMI (r=.417) and LDL-C (r=-.109).

Conclusion: Compared to the women, higher score in Role Emotion of SF-36 life scale in men suggested they have less emotion influence on work or daily activities, with better self-awareness on health. The white blood cells, mean hemoglobin, platelet count, and urea nitrogen drop rapidly in the 51–60 age band, suggesting that such physiological indices could be considered as an important aging indicator of metabolic function coinciding with the concept of middle-aged health and wellness at present. The relative grip strength was negatively associated with the BMI and low-density cholesterol, demonstrating the potential relationship between the physical fitness indicator and favorable factor of cardiovascular function. This study could provide Taiwan’s long-term care decision makers with more accurate information on health improvement of home care workers.

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THE EFFECTS OF MORINGA OLEIFERA SEED EXTRACT (MORINGA OLEIFERA) TOWARDS IL-6 EXPRESSION IN DUODENUM TISSUE OF WISTAR RAT (RATTUS NORVEGICUS) ON HIGH-FAT HIGH-FRUCTOSE DIET

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Objectives: High-fat and high-fructose diet cause accumulation of lipid tissues and central adipocyte cell known as central obesity. Central obesity is the main component of a metabolic syndrome that induces oxidative stress. This syndrome produces inflammation reaction marked by increase pro-inflammatory cytokine such as interleukin 6 (IL-6) on intestinal duodenal mucosa. Moringa seeds (Moringa oleifera) have antioxidant components consist of quercetin, kaempferol, flavonoids and anthocyanins that can decrease inflammatory mediators. The purpose of this research is to know the effects of Moringa oleifera seed ethanolic extract towards IL-6 expression in duodenum tissue of Wistar rat (Rattus norvegicus) on a high-fat and high-fructose diet.

Materials and Methods: This laboratory experimental research used posttest only group design with 28 Wistar rats divided into 4 groups. Group 1 (G) was given a standard pellet feed as control. G2, G3 and G4 were given a high-fat and high-fructose feed for 53 days. Then, Moringa seeds extract was given to G3 with dose 150mg/kgBW and G4 with dose 200mg/kgBW. After 28 days, process continued with termination and duodenal tissue was collected to make histological preparations with immunohistochemical (IHC) staining. IL-6 expression was calculated using intensity distribution score (IDS) then, analyzed by comparative Kruskal-Wallis test and post hoc Mann-Whitney test.

Results: The highest expression of IL-6 was found in G2, followed by G1, G3 and the lowest was G4. Kruskal-Wallis comparative test results showed a significant difference in IL-6 expression between 4 groups (p<0.05). From the results of the Mann-Whitney test post hoc test obtained a significant difference between IL-6 expression on duodenal tissue group G1-G2, G1-G4, G2-G3, G2-G4, and G3-G4 (p<0.05). However, G1-G3 didn’t show significant differences in IL-6 expression (p>0.05).

Conclusion: Moringa seeds ethanolic extract with dose 150 mg/kgBW and 200 mg/kgBW have a significant potential to decrease IL-6 expression in duodenal tissue of Wistar rat on high-fat and high-fructose diet.

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THE EFFECT OF MORINGA OLEIFERA SEED EXTRACT (MORINGA OLEIFERA) TO TNF-α EXPRESSION IN COLON TISSUE OF WISTAR RATS (RATTUS NORVEGICUS) ON HIGH-FAT HIGH-FRUCTOSE DIET

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Objectives: Consumption of low-fiber foods causes metabolic disorders which result in increasing of pro-inflammatory cytokine, such as Tumor Necrotic Factor (TNF-α). Metabolic syndrome causes a decrease in normal flora and increases Short Fatty Acid (SFA). The increase number of SFA triggers the release of pro-inflammatory cytokines, such as TNF-α. Oxidative stress that occurs in colon can be inhibited by consuming antioxidant. Moringa oleifera seed contains vitamin A, beta carotene, and α-linolenic acid. The purpose of this study is to know the benefits of moringa seed towards the TNF-α expression in colon tissue of Wistar rats with a high-fat and high-fructose diet.

Materials and Methods: This laboratory experimental study used 28 Wistar rats which were divided into 4 groups. Group 1 (G) was given a standard pellet feed, G2, G3, and G4 were given high-fat and high-fructose feed for 53 days, Moringa seed extract was then given to the G3 with a dose of 150mg/kgBW and G4 at 200mg/kgBW. The dependent variable of this study is the expression of TNF-α in colon tissue while the independent variable is an ethanolic extract of Moringa seeds. After 28 days termination was done and colonic tissue was taken to make histological preparations with immunohistochemical staining. TNF-α expression was calculated using an intensity distribution score and then analyzed using the Kruskal-Wallis comparative test and Mann-Whitney post hoc test.

Results: Kruskal-Wallis comparative tests results showed a significant differences in TNF-α expression between groups (p<0.05). From the results of the Mann-Whitney post hoc test obtained a significant difference between G1 and G2 (p<0.05). G2 with G3 and G4 also showed significant differences (p<0.05). However, G1 with G3 and G4 did not show differences in contributing TNF-α (p>0.05).

Conclusion: Moringa seed extract dose of 150 mg/kgBW and 200 mg/kgBW can reduce TNF-α expression, which supports Wistar rats colon organ with a high-fat high-fructose diet.

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IMPACT OF PRE-PREGNANCY BMI AND GESTATIONAL WEIGHT GAIN ON THE RISK OF GESTATIONAL DIABETES MELLITUS

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Objectives: Overweight or obesity have been associated with adverse maternal outcomes, however, optimal gestational weight gain remained unclear. The aim of this study is to examine the joint effects of pre-pregnancy body mass index (BMI) and gestational weight gain on gestational diabetes mellitus (GDM).

Materials and Methods: A total of 3,460 pregnant women who completed from baseline examination to delivery for the Korean Pregnancy Outcome Study between 2013 and 2017. Maternal pre-pregnancy BMI and appropriate weight gain was divided into underweight (<18.5 kg/m², 12.5-18.0 kg), normal weight (18.5-22.9 kg/m², 11.5-16.0 kg), overweight (23.0-24.9 kg/m², 11.5-16.0 kg), and obesity (≥25.0 kg/m², 7.0-11.5 kg for 25.0-29.9 kg/m²; 5.0-9.0 kg for ≥30.0 kg/m²) according to Institute of Medicine 2009 guidelines. GDM was diagnosed using a 50-g glucose challenge test with the confirmatory oral glucose tolerance test.

Results: The incidence of GDM was 7.1% (n=244) and its risk increased significantly by pre-pregnancy maternal BMI after adjusting for age, socioeconomic status, parity, smoking, drinking, and physical activity. Compared to normal BMI group, the adjusted odds ratios (OR) for the risk of GDM were 0.456 [95% Confidence Interval (CI): 0.249-0.835], 1.794 [95% CI: 1.213-2.652], and 3.529 [95% CI: 2.540-4.904] in pre-pregnancy maternal BMI on underweight, overweight, and obesity, respectively. Among them, GDM was more than twice as incident in inadequate gestational weight gain [OR: 2.242; 95% CI: 1.653-3.041] than appropriate weight gain.

Conclusion: Maternal weight management before and during pregnancy was associated with GDM. Appropriate weight gain could determine pregnancy complications.

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MORINGA OLEIFERA, LAM. EXTRACT AS HYPOLIPIDEMIC AGENT THROUGH DECREASING PLASMA MALONDIALDEHYDE OF WHITE RAT (RATTUS NORVEGICUS) WITH METABOLIC SYNDROME

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Objectives: High fat and high fructose diet have a high relationship with metabolic syndrome. Metabolic syndrome related with enhancement of free radical and reduction of antioxidant through hyperlipidemia. High level of lipid in metabolic syndrome can increase probability of lipid peroxidation that lead to oxydative stress. Secondary product of lipid peroxidation, Malondialdehyde (MDA), is the most mutagenic product in lipid peroxoyoation process that used to be oxydative stress biomarker. Moringa oleifera, lam. is a herbal plant which have secondary metabolite product that potentially can reduce free radical. This research intend to determined the effect of moringa roots extract as hypolipidemic agent through decreasing plasma malondialdehyde (MDA) of white rats with metabolic syndrome.

Materials and Methods: This was laboratory experimental research using posttest only group design. Rats were divided into 5 groups: K1 were control group, K2 were metabolic syndrome rats model, K3, K4 and K5 were metabolic syndrome rats model and given moringa roots extract dose 150 mg/KgBW, 250 mg/KgBW and 350 mg/KgBW. The metabolic syndrome induced by duck yolk 2 ml/200 gBW, oxidized oil 2ml/200 gBW, beef tallow 2 ml/200 gBW for 28 days, streptozotocin 45 mg/KgBW-nicotinamide 110 mg/KgBW for single administration and moringa roots extract as intervention was given 28 days.

Results: Effect of high fat diet and streptozotocin-nicotinamide, and effect of moringa roots extract to plasma MDA were analyzed with one way ANOVA test continued with tukey HSD test. One way ANOVA test of plasma MDA showed that there were significant differences (p<0.05), whereas tukey HSD test showed there were significant differences of plasma MDA between K1-K2, K2- K3, K2-K4 and K2-K5 (p<0.05).

Conclusion: Moringa oleifera, lam. roots extract at a dose of 150 mg/KgBW, 250 mg/KgBW and a dose of 350 mg/KgBW potentially reduced plasma malondialdehyde (MDA) in metabolic syndrome white rats (Rattus norvegicus).

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HERBAL THERAPY: THE ANTI-INFLAMMATION EFFECT OF ETHANOLIC EXTRACT OF MORINGA OLEIFERA LAM. SEEDS ON INTERLEUKIN-1β EXPRESSION IN HEPATIC TISSUE OF METABOLIC SYNDROME RATS

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Objectives: High intake of fat and sugar has been associated with chronic inflammation due to the increased production of reactive oxygen species that impact on increasing interleukin-1β (IL-1β) expression. Moringa oleifera Lam. contains plenty of secondary metabolites rich in antioxidants. This research aimed to determine the anti-inflammation effect of ethanolic extract of Moringa oleifera Lam seeds (MSE) to IL-1β expression in hepatic tissue of metabolic syndrome (MetS) rats.

Materials and Methods: Twenty-four male Wistar rats (n=24) which were assigned into 4 groups: Control (C), and 3 MetS groups that were fed with high-fat high-fructose diet (HFHFD). After 53 days, MetS 3 and MetS 4 groups were given 150 and 200 mg/kg of MSE, respectively. After 28 days of MSE delivery, the rats would be sacrificed and its IL-1β expression in hepatic tissue would be assessed microscopically and analyzed semiquantitatively with intensity distribution score (IDS). The effect of MSE to IL-1β expression on hepatic tissue was analyzed with ANOVA test and Tukey HSD posthoc test.

Results: One-Way ANOVA test showed a significant difference of IL-1β expression between four groups (p < 0.05). Tukey HSD posthoc test showed a significant difference between C and MetS 1 groups (p < 0.05), between the MetS groups (p < 0.05), but not between C and MetS 3 groups (p > 0.05). These results showed that MSE at dose of 200 mg/kg significantly reduces IL-1β expression in hepatic tissue of MetS rats.

Conclusion: It is concluded that MSE had a significant anti-inflammation property and this might be attributed to its antioxidant metabolites. The effect might be beneficial in diminishing the role of inflammation in progression of metabolic syndrome.

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**P057**

**CORRELATION BETWEEN FASTING BLOOD GLUCOSE AND ELECTROCARDIOGRAM PROFILE OF TYPE 2 DIABETIC PATIENTS IN BANGUNTAPAN, YOGYAKARTA**

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**Objectives**: The objective of this study was to describe the correlation of the fasting blood glucose level and the resting electrocardiogram (ECG) profiles of type 2 diabetic patients in Banguntapan. The complication of DM type 2 and cardiovascular disease must be warned earlier.

**Materials and Methods**: We carried out a cross-sectional study which held in June-August 2018. Subjects are 34 patients aged 25-64 years old and willing to take part in the study. The exclusion categories are patients with cardiovascular history and alcohol consumption. The data were collected using physical examination, fasting blood glucose check using Glucometer, and recording resting ECG. The respondent should be fasting 8-10 hours before having fasting blood glucose checking. The ECG results are categorized by normal and abnormal. The normal profile means sinus rhythm, while the abnormal profile means ventricle hypertrophy, ischemic, dysrhythmia, and myocardial infarction. The ECG speed used is 25 mm per second. ECG recording is done on all lead (I, II, III, AVL, avR, avF, V1-V6). The reading of the ECG record has been cross-checked by the general practitioner before processing data.

**Results**: The results showed that the respondents fasting blood glucose levels averaged 111mg/dL. There were 29.4% abnormal ECG images and 70.6% normal picture in type 2 DM patients. The value of fasting blood glucose levels was not related to the electrocardiogram in type 2 DM patients with p = 0.457. This is a weakness of our research because the bias that occurs is quite large.

**Conclusion**: There is no correlation between fasting blood glucose level and electrocardiogram profile. The complication from type 2 DM to cardiovascular disease need a long time to make a significant abnormal profile in the electrocardiogram.

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**P058**

**ASSOCIATION BETWEEN DIETARY VARIETY AND METABOLICALLY HEALTHY AND UNHEALTHY PHENOTYPES AMONG MIDDLE-AGED KOREANS IN URBAN AREAS**

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**Objectives**: The aim of this study was to investigate the prevalence of metabolically healthy and unhealthy phenotypes, and their association with dietary variety among middle-aged Koreans in urban areas.

**Materials and Methods**: Participants were 138,221 subjects enrolled in the Health Examinees (HEXA) study of the Korean Genome Epidemiology Study (KoGES). Data were collected using self-administered questionnaires, anthropometric measurements, and blood chemical analysis. Dietary variety score (DVS) was calculated as the number of different food choices consumed, and a higher score indicates a more varied diet. Metabolically healthy phenotype was defined as not meeting the metabolic syndrome (MetS) criteria defined based on the National Cholesterol Education Program/Adult Treatment Panel III (NCEP-ATP III) criteria. Non-obese normal weight and obesity were defined as a body mass index (BMI) <25 kg/m² and ≥25 kg/m², respectively.

**Results**: The prevalences of metabolically unhealthy obese (MUHO) and metabolically unhealthy non-obese (MUHNN) phenotypes were significantly higher in the first quartile of DVS than in the fourth quartile of DVS. Conversely, subjects in the first quartile of DVS had lower prevalences of metabolically healthy obese (MHO) and metabolically healthy non-obese (MHNW) phenotypes compared to the participants in the fourth quartile of DVS. Compared with participants in the highest quartile, those in the lowest quartile of DVS had higher odds ratio (OR) of MUHO (OR=1.52, 95% CI: 1.34-1.71, P-trend <0.0001) and MUHNN phenotypes (OR=1.55, 95% CI: 1.49-1.61, P-trend <0.0001). After adjusting for potential confounder variables, the OR for MUHNNW was adversely related with DVS (OR=1.13, 95% CI: 1.07-1.18 in the lowest quartile, P-trend <0.0001). However, MUHO phenotype did not show this association.

**Conclusion**: Our findings supported that lower dietary variety were adversely associated with the MUHNNW phenotype in middle-aged Koreans. Future longitudinal studies are needed to assess the causal relationship between the dietary variety and metabolically healthy phenotypes.

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**P059**

**NARINGENIN ATTENUATES GLUCONEOGENESIS AND ENHANCE INSULIN SIGNALING IN SODIUM ARSENITE INDUCED DIABETIC MICE**

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**Objectives**: Diabetes mellitus (DM) is a metabolic disorder, characterized through severe hyperglycaemia along with altered fat, protein and carbohydrate metabolism chiefly results from defects in insulin secretion/insulin action or both. Arsenic is a naturally occurring heavy metal that induced the diabetes. During the diabetes, arsenic induce the oxidative stress mediated destruction in insulin signalling in rodent. In the current study, naringenin could attenuated the sodium arsenite (iAs) induced hyperglycemic condition via impaired insulin signalling in rats.

**Materials and Methods**: Intraperitoneal injection of iAs was used for induced the DM. Body weight, biochemical, antioxidant and hepatic parameters were determined at regular interval. iAS treatment used for the estimation of hepatocytes, β-cells, ROS accumulation and cytodegenerative effect were assayed. RT-PCR techniques were used for the estimation of underlying mechanism. Histopathology analysis was performed for the estimation of changes.

**Results**: Naringenin treatment significantly (P<0.001) reduced the blood glucose level (57%) and oxidative stress by alteration in the activity of CAT (54%), SOD (58%), GPx (43%) and MDA (43%), respectively. Naringenin also improved the plasma insulin level (63%) brought down after iAS treatment. Naringenin also induced cyto-degeneration of pancreatic β-cells (43%) and hepatocytes, and helped to scavenge the free radicals. Naringenin further reduced the level of TNF-α (54%) and IL-6 (45%), IL-1β (43%) with up-regulation of IRS-1 (23%), IRS-2 (34%), GLUT4 (54%), AKT (23%), P13K (36%) and PPAR (34%) signaling molecules at mRNA and protein levels.

**Conclusion**: Collectively, we can say that naringenin possesses and anti-diabetic effect and enhance the diminished insulin signaling in arsenic intoxicated mice.

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**P060**

**DYNAMICAL MODELING WITH SIMULATIONS OF DIABETES MELITUS WITHOUT GENETIC FACTORS USING TREATMENTS**

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**Objectives**: Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many of the body’s systems, in particular the blood vessels and nerves. Diabetes mellitus is known by Mother of Disease because this disease is the essence of other diseases such as hypertension, cardiac disease, and blindness.

**Materials and Methods**: A continuum approach based on systems biology is adopted and ODEs are used to model the temporal and spatial evolution of the dependent variables. The analysis with Mathematics and computer approaches is very dominant. Broadly speaking, the stages start from forming the governing equation, geometry projection, determining boundary and initial conditions, analysis of a reduced model: parameter estimation, numerical simulation and determining treatment regimes.

**Results**: Simulation at free equilibrium point Po = (N, E, I, T) shows that N will be stable at point N (t) = 757.5. E, I, and T will be stable at point E(t) = 0, I(t) = 0 and T(t) = 0. Simulation at endemic equilibrium point P1 = (N*, E*, I*, T*) shows that the population in each subpopulation will always be present in the population, the point N* will show the balance of point No* and the point E*, I*, T* will be stable at point E*(t) = 0.5, I*(t) = 0.8 and T*(t) = 200.

**Conclusion**: The mathematical model of diabetes mellitus disease without genetic factors with treatment has two equilibrium points ie free of disease Po = (A/Mu, 0, 0, 0) and endemic P1 = (N*, E*, I*, T*). In addition, the basic reproduction number obtained and the results of numerical simulation.

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TRIGLYCERIDE AND GLUCOSE (TyG) INDEX IS AN EFFECTIVE PREDICTOR OF NONALCOHOLIC FATTY LIVER DISEASE/NONALCOHOLIC STEATOHEPATITIS

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Objectives: The aim of this study was to investigate the ability of triglycerides and glucose (TyG) index to identify nonalcoholic fatty liver disease (NAFLD)/nonalcoholic steatohepatitis (NASH) through comparing with fatty liver index (FLI) in a Korean population using a large health study database.

Materials and Methods: We enrolled 187,725 subjects (107,246 men and 80,479 women) in the Kangbuk Samsung Health Study cohort. All subjects were completed a comprehensive annual or biennial health examination from 2007 through 2013. The presence of NAFLD was ascertained by ultrasonography in the absence of other known liver diseases. NASH was defined as NAFLD with FIB-4 index > 1.3.

Results: Mean age was 37 years and mean body mass index (BMI) was 23.26 m/kg. The prevalences of NAFLD and NASH were 35.66 % (n = 66,946) and 3.06 % (n = 5,749), respectively. During a median 3.92-year follow up, the hazard ratios (HR) of TyG index and FLI for NAFLD were 1.772 (95% CI 1.747-1.798) and 1.424 (95% CI 1.411-1.438), respectively. After adjusting for age, sex, and BMI, there were still elevated HRs for NAFLD (TyG index: 1.322, 95% CI 1.301-1.344; FLI: 1.094, 95% CI 1.073-1.116). The area under the ROC curve for identifying NAFLD of TyG index and FLI were 0.799 and 0.873, respectively. In non-obese subjects (BMI < 23 kg/m²), higher TyG index was associated with an increased risk of NASH (HR 1.222; 95% CI 1.095-1.363) but FLI was not (HR 1.056; 95% CI 0.922-1.209). In addition, there were similar results in obese subject (TyG index: 1.085, 95% CI 1.046-1.126; FLI: 0.994, 95% CI 0.942-1.049). These results suggested that TyG index was superior to FLI in association with NAFLD/NASH risk.

Conclusion: The TyG index is effective to identify subjects at risk for NAFLD/NASH.

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CONTRIBUTION OF DIETARY SODIUM INTAKE TO CARDIOVASCULAR DISEASE BURDENS IN KOREANS: FINDING FROM THE KOREA NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY 1998-2016

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Objectives: The sodium intake of Koreans has been higher than the global level for a long time. Increased dietary sodium intake increases the risk of cardiovascular disease (CVD), which is mediated by elevated blood pressure. We aimed to evaluate the contribution of high sodium intake to CVDs in Korean adults from 1998 to 2016.

Materials and Methods: A comparative risk assessment (CRA) was performed for estimation for CVD-related deaths attributable to high sodium intake. Korea National Health and Nutrition Examination Survey data were used to determine current exposure levels of sodium intake. Participants in this analysis were included after stratified by sex or age; 25-34, 35-44, 45-54, 55-64, and ≥ 65 years. Hemorrhagic stroke (HSTK), ischemic stroke (ISTK), and ischemic heart disease (IHD) were defined as CVD. A daily sodium intake of 2,000 mg was defined as an optimal level that represents the minimum risk of CVD mortality.

Results: Dietary sodium intake for all participants between 1998 and 2016 decreased significantly (mean intake: 5,175 mg/day in 1998 and 3,647 mg/day in 2016). Although the intake pattern for sodium were similar between men and women, substantial difference in its distribution among age groups was observed. During the same period, population attributable fractions (PAFs) of sodium intake was decreased by 40.8% for HSTK, 42.2% for ISTK, and 41.9% for IHD, respectively. The values of PAF tended to be higher at older ages, but in terms of subjects aged over 65 years, the magnitude of them was estimated to be lower than adults aged 35-64 years. The total number of deaths attributable to high sodium intake increased from 6,806 in 1998 to 12,165 in 2005, but then steadily decreased to 5,435 in 2016.

Conclusion: Between 1998 and 2016, the burden of disease caused by high sodium consumption was decreased and varied with age.

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Nutrition

P063

HIGH HYDROSTATIC PRESSURE EXTRACT OF MULBERRY FRUIT ATTENUATES INFLAMMATION IN LPS-STIMULATED RAW264.7 CELLS

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Objectives: Mulberry (Morus alba) fruit is generally consumed for its delicious taste, pleasing color, and pharmacological effects. High hydrostatic pressure processing is applied to the plant extraction to increase the yield of bioactive compounds and ensure microbiological safety. This study aimed to investigate the anti-inflammatory properties of high hydrostatic pressure extract of mulberry fruit (HM) in lipopolysaccharide (LPS)-stimulated RAW264.7 cells.

Materials and Methods: RAW264.7 cells were pre-incubated with HM at various concentrations (0.1 to 1 μg/mL) for 2 hours and then stimulated with LPS (1 μg/mL) for another 24 hours. After incubation, the production of nitric oxide (NO) and pro-inflammatory cytokines were determined in the culture medium. In addition, the expression of inflammatory modulators, such as inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2), was analyzed.

Results: HM showed anti-inflammatory activity through the inhibition of NO release from in LPS-stimulated RAW264.7 cells (p < 0.05). In addition, HM inhibited the mRNA expression of iNOS (p < 0.05). Moreover, HM suppressed both mRNA and protein expressions of COX-2 (p < 0.05). In the culture medium, the concentration of pro-inflammatory cytokines such as interleukin (IL)-6 and tumor necrosis factor (TNF)-α from LPS-stimulated macrophages was reduced by the HM (p < 0.05).

Conclusion: These results indicate that HM inhibits LPS-induced inflammation in RAW264.7 cells. Therefore, it is suggested that HM has the potential to be used as a nutraceutical for the prevention of inflammation-associated disorders.

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P064

THE EFFECT OF SYNBIOTIC DRINK OF JICAMA CONCENTRATE (PACHYRHIZUS EROSUS) AND KEFIR GRAIN ON HISTOPATHOLOGY OF TESTICULAR TISSUE IN HYPERLIPIDEMIC RAT MODEL

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Objectives: The high-fat diet which induces hyperlipidemia can adversely affect normal male reproductive function. Histopathological alterations in basement membranes of seminiferous tubules can partially be thickened. As a treatment, we used jicama concentrate and kefir grain as a synbiotic drink presumed to have the anti-cholesterol effect. The aim of this research is to know how synbiotic drink effect on the histopathology of testicular tissue in the hyperlipidemic rat.

Materials and Methods: This research used 25 rats model were divided into 5 different groups; K- for the negative control, K+ for positive control, P1, P2, and P3 for the intervention group. The first 4 weeks, they were given quail egg yolks 500 mg/kgBW/day. This treatment makes rats in the hyperlipidemic condition. In the next 4 weeks after the hyperlipidemia condition, the intervention groups were given 500 mg/kgBW/day synbiotic drink with a different formulation. They consisted of 70% Jicama concentrate (JC), 30% Kefir grain (KM) for P1, 30% JC and 70% KM for P2, 50% JC and 50% KM for P3. In the end, all rats were terminated to take testicles and dissected transversally and then stained using hematoxylin and eosin. The thickness of the basalis membrane epithelium in seminiferous tubules measured by ImageJ

Results: All data were expressed as mean ± SD (μm). (K+) 22.20 ± 2.23, (K-) 21.23 ± 1.18, (P1) 16.98 ± 3.03, (P2) 16.12 ± 2.56, (P3) 18.72 ± 0.49. The result of basalis membrane epithelium thickness in one way ANOVA analysis was no significant between all groups (p > 0.05).

Conclusion: The intervention of jicama concentrate and kefir grain as a synbiotic drink has no significant effect on the histopathology of testicular tissue in hyperlipidemic rats.

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**P065**

**COMPARATIVE STUDY OF RICE AND FOXTAIL MILLET-BASED FOOD ON IN TYPE 2 DIABETES**

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**Objectives**: Medication, lifestyle modification, and dietary management are a major role in the prevention of this diabetes. Millets represent low glycemic index (GI) food and may be an ideal diet for diabetics. The study aimed at standardizing idli (Indian subcontinent food) using foxtail millet and assessing their effect on diabetic subjects.

**Materials and Methods**: Two types of idli items (prepared using rice and foxtail millet) were chosen for the study. A sample of 8 types 2 diabetic subjects was selected using the purposive sampling technique and the comparative glycemic response was studied for three different days. The blood samples were collected from all subjects to determine the fasting and postprandial plasma glucose.

**Results**: The mean fasting and postprandial plasma glucose of foxtail millet idli ingested subjects was 119.68±22.43 and 134.74±27.67 mg/dl respectively. Whereas mean fasting and postprandial plasma glucose of rice-based idli ingested subjects was 121.36±31.25 and 150.17±87.08 mg/dl respectively. Hence, postprandial plasma glucose levels after ingesting the millet idli were less as compared to rice-based.

**Conclusion**: Millet-based food show better glycemic response as compared to the rice. Thus, the current study recommends that millets-based food items must be encouraged in worldwide for the diabetes prevention program.

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**P066**

**ANTIOXIDANT CAPACITY OF SEA BUCKTHORN BERRY ON ISCHEMIC STROKE**

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**Objectives**: The present study was conducted to elucidate the antioxidant capacity of sea buckthorn berry on ischemic stroke.

**Materials and Methods**: In vitro model, the acute ischemic condition was established by 2 hr of glucose and oxygen deprivation in primary cortical neuron cells. In vivo, acute ischemia rodent model was established by 2 hr occlusion on middle cerebral artery. Sea buckthorn berry was extracted with 70% methanol and an extract of 5% w/w was obtained. Treatment of the extract at doses of 100 and 500 ug/ml significantly improved the survivability of cortical neurons.

**Results**: The sea buckthorn induced an increase of total antioxidant capacity, superoxide dismutase and catalase expression in the event of an in-vitro acute ischemic injury. Treatment of sea buckthorn 50 mg/kg i.p. decrease 30% of infarct volume with the expansion of penumbra in in vivo. The sea buckthorn induced an increase of total antioxidant capacity and superoxide dismutase in brain and blood significantly (p < 0.05). However, apoptosis and excocitotoxicity including caspase-3 and glutamate was not observed in acute ischemia model.

**Conclusion**: Sea buckthorn can be considered as a useful material for extension of therapeutic periods with the penumbra maintenance in an acute ischemic stroke.

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MALONDIALDEHYDE (MDA) LEVEL AND SUPEROXIDE DISMUTASE (SOD) INHIBITION RATE IN TESTICULAR ORGANS AFTER INTERVENTION OF ORANGE WATER KEFIR ON HYPERLIPIDEMIC RAT (RATTUS NOVERGICUS)

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Objectives: Hyperlipidemia causes increased mitochondrial Reactive Oxygen Species (ROS) lead to oxidative stress. Oxidative stress can be measured by elevated levels of malondialdehyde (MDA) and decreased of Superoxide dismutase (SOD) activity in cells and can result in the development of male infertility. Previous research has been shown that orange and kefir grains can improve lipid profiles. The aim of this research was to know the effect of orange fruit juice combined with kefir grains on MDA level and SOD inhibition rate of testicular organ on hyperlipidemic rat models.

Materials and Methods: This research used 15 rats divided into 3 groups (K+, K-, B). Group of K+ and B were given quail egg yolk for 4 weeks with a dose of 5 ml/200 grBW while group of (K-) is were only given fed ad libitum. For the next 4 weeks, K+ and K- groups were only given fed ad libitum and B group was given orange water kefir with composition 50% water kefir and 50% orange juice. The dose of juice was 5 ml/200 grBW. In the end of the research, all rats were terminated. The testicular organ were examined for MDA level and SOD inhibition rate. All data were expressed as mean ± SD statistically analyzed using statistic software type One-Way ANOVA followed by Bonferroni post-hoc test.

Results: Mean of MDA (mg/dl) level were 12.25±0.12 (K+), 2.83±0.12 (K-), 4.99±0.17 (B). Mean of SOD (%) inhibition rate were 32.86±3.02 (K+), 82.14±3.38 (K-), 82.85±3.22 (B). The One-Way ANOVA test showed significant differences in MDA level and SOD inhibition rate in testicular tissue between all groups with p<0.001 and Bonferroni post hoc test p<0.001.

Conclusion: Intervention of orange fruit juice combined with kefir grains as probiotic beverage significantly improve MDA level and SOD inhibition rate in testicular tissue of the hyperlipidemic rat models (p<0.001).

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NAA10 IS REQUIRED FOR Viability AND Development IN Mice

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Objectives: N-α-acetyltransferase 10 (Naa10), which is conserved from yeast to humans, modulates diverse biological processes including cell cycle regulation, DNA damage, apoptosis, cancer progress, development and disease. Naa10 regulates protein functions by acetylating the first α-amino group of a protein (N-α-acetylation) or the internal lysine residues of mature proteins (N-e-acetylation). It also plays a role independent of its acetylation functions by binding its partners to regulate their activities. Recent findings revealed that depletion of Naa10 in few species resulted in embryonal defects and point mutations of human NAA10 caused developmental defects. However, the effect of Naa10 on mice is poorly known.

Materials and Methods: Naa10-null knockout mice were generated based on a standard gene-targeting in E14 embryonic stem (ES) cells (129/Sv). The targeting vector was constructed to delete exons 1-4 in the Naa10 gene. Genotyping was performed by PCR and Southern blot analyses of genomic DNAs obtained from the tails. Perinatal lethality was monitored daily at P0 to P3. All statistical tests were two-sided, and P values less than .05 were considered statistically significant.

Results: We report that mice lacking Naa10 displayed common clinical features seen in human diseases such as developmental delays, growth retardation, hydrocephalus, cardiac defects and urogenital abnormalities. In particular, the postnatal lethality was increased, which is likely to be associated with structure anomalies in heart and hydrocephalus.

Conclusion: In conclusion, our data demonstrates that Naa10 has essential roles for viability, development and diseases.
P069

CD137 SIGNALING CONTROLS DSS-INDUCED ACUTE COLITIS VIA INTESTINAL CD11b\(^{+}\)CD103\(^{+}\) DCS

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**Objectives**: CD137, a potent costimulatory receptor for CD8\(^{+}\) T cells, is also expressed in a variety of non-T cells. However, limited information is available on the precise role of CD137 in the development of colitis in experimental model.

**Materials and Methods**: To answer this, we generated CD137 deficient (CD137\(^{-}\)) mice and dendritic cell (DC) specific CD137 deficient (CD11c-cre CD137\(^{-}\)) mice. To determine the molecular mechanisms of CD137 in CD11b\(^{+}\)CD103\(^{+}\) DCs, we assessed in bone marrow derived CD11b\(^{+}\)CD103\(^{+}\) DCs.

**Results**: We show that CD137 signaling in intestinal CD11b\(^{+}\)CD103\(^{+}\) dendritic cells (DCs) restricts the progression of acute colitis. Specific deletion of the CD137 gene in DCs results in a reduction in CD11b\(^{+}\)CD103\(^{+}\) DCs and regulatory T cells of the lamina propria and mesenteric lymph nodes during acute colitis. Mechanistically, CD137-mediated activation of TAK1 in CD11b\(^{+}\)CD103\(^{+}\) DCs results in inhibiting degradation of the anti-apoptotic Bcl-2 and Bcl-xL and upregulating retinaldehyde dehydrogenase 2 (RALDH2) expression. The quantitative and qualitative changes in DCs are linked to induction of Foxp3\(^{+}\) regulatory T cells and suppression of pathogenic IL-23 production by intestinal CD11b\(^{+}\)CD103\(^{+}\) DCs.

**Conclusion**: Our results indicate that CD137 signaling in intestinal CD11b\(^{+}\)CD103\(^{+}\) DCs is an important immune checkpoint for acute colon inflammation induced by epithelial barrier disruption.

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P070

CURCUMIN SUPPRESSES ACROLEIN-INDUCED COX-2 EXPRESSION IN ENDOTHELIAL CELLS

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**Objectives**: Inflammation is crucial to limiting vascular disease. Previously we reported that acrolein, a known toxin in tobacco smoke, may play an important role in progression of atherosclerosis via an inflammatory response involving cyclooxygenase-2 (COX-2) and prostaglandin (PG) production in human umbilical vein endothelial cells (HUVECs). Curcumin has been known to improve vascular function and have anti-inflammatory properties. In here we investigated whether curcumin prevents the induction of inflammatory response by acrolein.

**Materials and Methods**: In this study we investigated that curcumin suppress acrolein-induced COX-2 expression at and protein levels, and that this inhibition is involved in abolition of oxidative stress and ER stress in HUVECs. We also examined that acrolein-induced activation of PKCd, p38 MAPK and CREB pathway is blocked by curcumin.

**Results**: Curcumin attenuates inflammatory response via inhibition of COX-2 and prostaglandins production on acrolein-induced human endothelial cells. This inhibition is involved in abolition of phosphorylation of PKc, p38 MAPK and CREB by curcumin, Furthermore, curcumin suppress the production of ROS and ER stress by acrolein.

**Conclusion**: These results suggest that curcumin may useful agent for endothelial dysfunction against acrolein-induced inflammatory response.

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P071

NEPHROPROTECTIVE POTENTIAL OF GALIC ACID METFORMIN AGAINST STREPTOZOTOCIN INDUCED DIABETIC NEPHROPATHY IN WISTAR RATS VIA INHIBITION OF DPP-4 AND TGF-β

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**Objectives**: Dipeptidyl-peptidase IV inhibitors (DPP-4) have gain popularity day by day as anti-diabetic agents and now are broadly used in the treatment of type 2 diabetes with chronic renal dysfunction. DPP-4 inhibitors have potential to reduce the glucose level independent of the renal function either reduce the level of glycated albumin without inducing the hypoglycaemic effects. Studies suggest that DPP-4 exert the renal protective effect via maintain the incidence of albuminuria. The current experimental study was make attempt to explore the renal protective effect of gallic acid-metformin (GA-Met) against the STZ induced diabetic rats via inhibition of DPP-4 and TGF-β.

**Materials and Methods**: GA-Met was scrutinizing against the DPP-4 inhibitor. GA-Met were also examined via Insilco study with the structure of DPP-4 to identify the critical interactions for its bioactivity. STZ was used for induction the type 2 diabetes and blood glucose level, biochemical, antioxidant, cytokines and inflammatory mediators were estimated.  

**Results**: DPP-4 assay, GA-Met was found as potential drug with IC50 value = 4.34 μM. GA-Met Insulico interacted with various residue of DPP-4 inhibitor. GA-Met significantly reduced the blood glucose level (67%) and increased the plasma insulin level (45.5%). GA-Met improve the interstitial fibrosis, tubulointerstitial injury and inflammatory cell infiltration in animal tissue. GA-Met exhibited the significantly decrease the level of TNF-α (45%), IL-1β (54.3%), IL-6 (56.1%), caspase-1 (43%), caspase-3 (40.4%), COX-2 (65%), PGE2 (60.3%) and NF-kB (52.3%). Oxidative stress marker and the expression of transforming growth factor-β (TGF-β) in the renal tissue of diabetic rats were significantly (P<0.001) altered by GA-Met treated group rats.

**Conclusion**: The current investigation suggests that GA-Met exert the renal protective effect against the STZ induced DN rats via inhibition of DPP4 and TGF-β.

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P072

EFFECT OF COMBINATION THERAPY WITH EZETIMIBE AND ATORVASTATIN ON HEPATIC PHOSPHOLIPID METABOLISM IN A RAT MODEL OF OBESITY AND TYPE 2 DIABETES

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**Objectives**: Ezetimibe, blocking an intestinal cholesterol transporter, and atorvastatin, inhibiting cholesterol production, are frequently co-administered to treat patients with dyslipidemia by controlling the level of low-density lipoprotein cholesterol. A combination therapy of ezetimibe and statin has been reported to reduce hepatic steatosis in human and animals, but the underlying mechanism remains largely unknown. The purpose of this study was to investigate changes in hepatic metabolites and lipids in response to treatment with a combination of ezetimibe and atorvastatin in an animal model of obesity and type 2 diabetes.

**Materials and Methods**: Male obese and diabetic OLETF rats were orally administered either vehicle (CONTROL), ezetimibe (10mg/kg, EZ), atorvastatin (5mg/kg, ATO), or a combination of ezetimibe/atorvastatin (10mg/kg and 5mg/kg, EZ/ATO) fed on high fat diet (60 kcal % fat) for 12 weeks. Hepatic metabolites were analyzed via metabolomic and lipidomic analyses.

**Results**: OLETF rats that received EZ, ATO, and EZ/ATO showed decreased in hepatic fat accumulation and improvement of lipid profiles in liver and plasma including total cholesterol, triglyceride and free fatty acid compared to CONTROL rats. Lipid profiles in liver and plasma were improved in EZ/ATO, and lesser extent by EZ and ATO. In addition, EZ, ATO, and EZ/ATO treatment significantly altered levels of hepatic metabolites, including amino acids, free fatty acids, lysophosphatidylcholines, phosphatidylcholines, and triglycerides in the liver. EZ and EZ/ATO treatment were more likely to increase phosphatidylcholines with arachidonyl moiety, which is strongly correlated with hepatic VLDL metabolism and lipid droplet production, compared to ATO alone.

**Conclusion**: Our results demonstrated that the combination therapy of ezetimibe and atorvastatin resulted in alteration of hepatic metabolites and lipids, especially, phospholipids, which is different from treatment with EZ or ATO alone, thus possibly contributing to effective amelioration of hepatic steatosis.

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P073

CUBAN POLICOSANOL INCREASES OSTEOBLAST DIFFERENTIATION BY INDUCING ACTIVATION OF AMPK

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Objectives: Policosanol is a hypocholesterolemic compound with the function of reducing the level of blood cholesterol. Other functions have been reported to lower blood pressure and reduce liver inflammation. However, the function of policosanol in osteoblast differentiation has not been elucidated. The purpose of this study is to investigate the effect of policosanol on osteoblast differentiation and its molecular mechanism.

Materials and Methods: The MC3T3-E1 cell, preosteoblast cell line, was treated with policosanol to identify mRNA and protein levels of osteoblast differentiation marker genes. qPCR was performed to measure mRNA levels of osteoblast differentiation marker genes and Western blot analysis was performed to determine protein levels. ALP (alkaline phosphatase) staining was performed to measure the activity of the ALP enzyme. The mineralization of extracellular matrix was confirmed by alizarine red s (ARS) staining. Compound C, an AMPK inhibitor, was used to identify the mechanism by which policosanol regulates osteoblast differentiation. After treatment with Policosanol and Compound C, mRNA expression and protein level of osteogenic gene were determined by qPCR and Western blot respectively.

Results: The qPCR results show that the expression levels of Dlx5 and Runx2, the osteoblast differentiation markers, were increased. Western blot analysis confirms that policosanol increased protein levels of osteoblast differentiation markers. In addition, policosanol has been shown to exhibit synergistic effects with osteogenic conditions, both in ALP activity and mineralization. Policosanol induced the activation of AMPK, and the inhibition of AMPK, compound C, inhibited policosanol-induced osteoblast differentiation.

Conclusion: Taken together, policosanol increases osteoblast differentiation and its mechanism is to induce AMPK activation.

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P074

METABOLOMICS APPROACH VIA 1H NMR SPECTROSCOPY REVEALS LIPID BIOSYNTHESIS ALTERATION & NEUROLOGICAL DISORDERS IN COBALAMIN DEFICIENCY

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Objectives: To document the Lipid biosynthesis alteration in cobalamin deficiency patients. To study other metabolites and association with neurological disorders in cobalamin deficiency.

Materials and Methods: In this study, we report the status of Lipid synthesis alteration and metabolites in vitamin B12 deficiency. Fifty-one subjects with serum vitamin B12 deficiency (<211 pg/ml) were included. A 5 ml of venous blood was collected in sterile vacutainer tubes from each Cobalamin deficiency (COBA) patient and healthy control (HC) subject via venous puncture. Metabolomics combines analytical tools such as proton nuclear magnetic resonance (1H-NMR) spectroscopy experiments were performed in batches, comprising 10 samples each to avoid sample deterioration on storage during data acquisition. For each sample, NMR spectra were recorded at 300 Kelvin (K) on a Bruker Biospin Avance-III 800 MHz NMR spectrometer. Using standard parameters from the Bruker’s pulse program library sequence (cppmgpr1d), a transverse relaxation-edited CPMG (Carr–Purcell–Meiboom–Gill) 1D 1H NMR spectra were acquired, mainly to get information about micro molecular metabolites and remove broad signals from macromolecules like proteins, cholesterol, and phospholipids. The collected 1H-NMR spectra were phased, baseline corrected and referenced to lactate resonance at δ (1.31) ppm using Bruker NMR data Processing Software Topspin-v3.5.[C]

Results: In this study we observed that metabolites of which the concentration is increased in COBA are glucose, acetate, NAG, isoleucine, leucine, threonine, alanine, and glutamate and those with decreased concentration include high density lipoprotein (HDL), low density lipoprotein (LDL), very low density lipoprotein (VLDL), choline, poly unsaturated fatty acids (PUFA), lactate, and glutamine relative to the healthy controls. These data strongly support the robustness of 1H NMR to identify metabolic changes in the sera of COBA patients.

Conclusion: This study may help to find how metabolites and lipid synthesis alteration may be used as marker in neurological disorders associated with cobalamin deficiency.

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P075

HIGHER TRIGLYCERIDES AND GLUCOSE INDEX INCREASED THE RISK OF CATARACTS IN GENERAL POPULATION

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Objectives: Insulin resistance (IR) is closely related with development of various chronic complications, including visual disturbance. However, previous indices have some limitations. The objectives were to find whether triglycerides and glucose (TyG) index was useful in estimating the metabolic effect on ocular lens in the general population.

Materials and Methods: The study was conducted at the KNHANES IV and V in South Korea. We analyzed the anthropometric, biochemical, and ophthalmologic data, and used HOMA, QUICKI, and TyG index as a marker for IR. A total of 8,434 participants were divided into quintiles according to their gender and TyG index.

Results: The prevalence of cataracts increased with age and TyG index quintile (P<0.0001, respectively), and the nuclear type was more common subtype in this study (P<0.001). When comparing participants with cataracts to controls, higher TyG index was closely associated with cataracts (OR = 1.929, 95% CI = 1.722-2.162), and further adjustment for age, gender, waist circumference, serum triglyceride, and low-density lipoprotein cholesterol level did not attenuate this association (OR = 2.445, 95% CI = 1.200-4.980).

Conclusion: The TyG index can be a useful indicator of metabolic ocular problem, even in a pre-MetS state.

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P076

CUBAN POLICOSANOL PROTECTS LIPOPOLYSACCHARIDE INDUCED INFLAMMATION IN C2C12 CELL VIA AUTOPHAGE INDUCTION AND ALTERATION OF GLUCOSE METABOLISM

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Objectives: It has been reported that Policosanols lower LDL-cholesterol and triacylglycerol and increase HDL-cholesterol, which protect the vascular disease. In this study, we examined that policosanol may protect the muscle dystrophy induced by inflammation induced by sepsis or metabolic syndrome.

Materials and Methods: We examined the policosanol protection effect on the LPS induced inflammation with C2C12 cell. MTT, cell signaling pathway, autophagy, and alteration of glucose metabolism were checked in LPS and/or treated C2C12 cell.

Results: Policosanol inhibits the LPS induced C2C12 cell death in MTT assay. We observed that AMPK phosphorylation and expression of pyruvate dehydrogenase kinase 4 (PDK4), a major regulator of glucose metabolism, was induced by treatment of policosanol. Additionally, policosanol increased the LC3-II level, indicating of increasing of autophagy.

Conclusion: In this study, policosanol has protective effect on the LPS induced inflammation in muscle cell. This protection effect may due to the increase of autophagy and alteration of glucose metabolism. In order to elucidate the exact mechanism of policosanol, further study will be required.

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**Late-breaking (Pathophysiology of Atherosclerosis / Vascular Biology)**

**P077**

**VASCULAR REGENERATION THROUGH THE REPROGRAMMING OF HUMAN FIBROBLASTS BY PLANT STEM CELL EXTRACTS**

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**Objectives**: We have previously established a new method to produce induced pluripotent stem cells by delivering embryonic stem cell-derived proteins into adult mouse fibroblast. However, the protocol was not optimized in human because of its difficulty to prepare sufficient yield of human ES cell extracts. To overcome this problem, we hypothesized whether plant stem cell (callus)-derived proteins could reprogram human fibroblasts.

**Materials and Methods**: The plant stem cell or callus, a dedifferentiated plant cell mass, can regenerate itself and differentiate into many tissues of a whole plant body. In this study, based on the dedifferentiation characteristic of plant callus, we observed reprogramming activities of plant callus extract on human dermal fibroblast.

**Results**: Here, we demonstrate molecule ‘S’, major component of Sequoiadendron Giganteum (SG) callus extract, reprogrammed somatic fibroblast to Mesodermal and Ectodermal precursor cells. These cells expressed neural precursor specific protein Nestin as well as Fibronectin and Vimentin and could differentiate into ectodermal and mesodermal lineage but not into endodermal lineage. These gene expression might be regulated by epigenetic modification including promoter methylation and H3K4me3.

**Conclusion**: These results indicated that the molecule ‘S’ could be an effective agent for direct conversion of fibroblast to Mesodermal and Ectodermal precursor cells and for vascular regeneration.

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**Late-breaking (Hypertension)**

**P078**

**EFFECT OF HARVARD STEP TEST ON SYSTOLIC BLOOD PRESSURE MEASUREMENT AND PULSE RATE**

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**Objectives**: Measurement of systolic blood pressure is a method for recognizing hypertension. Many factors influence hypertension, one of which is lack of physical activity. Harvard step test is a test to detect heart and pulmonary disease. This test is also used to measure body fitness after exercise. This study aims to compare the systolic blood pressure and pulse before and after Harvard treatment step test.

**Materials and Methods**: This study used the design of one group pretest-posttest by comparing systolic blood pressure and pulse before and after Harvard treatment step test. Our sample of 21 adolescents (ages 17 to 20 years) from both sexes participated in this study. Systolic blood pressure was measured using a standard mercury sphygmomanometer and the pulse was measured using the manual method. We used the Shapiro-Wilk test for the normality test and the Wilcoxon test for comparison between systolic blood pressure and pulse rate from SPSS Statistics. This research was carried out in a physiology laboratory at the Islamic University of Indonesia, Yogyakarta.

**Results**: The average systolic blood pressure and pulse before the Harvard Step Test were 115.71 mmHg ± 9.25 and 79.71 beats ± 10.44 after the Harvard Step Test, the systolic blood pressure and pulse were 112, 38 mmHg ± 13.00 and 95 beat ± 19.23. Based on the Wilcoxon test with the SPSS application, there was no significant difference between systolic blood pressure before and after the Harvard Step Test (p>0.05), whereas in the pulse there was a significant difference between the pulse before and after the Harvard Step Test (p<0.05).

**Conclusion**: The Harvard Step Test does not show a significant effect on systolic blood pressure but shows a significant effect on the pulse rate.

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**P079**

**EARLY DETECTION OF HYPERTENSIVE URGENCY (HU): THE PIVOTAL ROLE OF PRIMARY HEALTH CARE**

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**Objectives**: Although HU had serious complications and poor long-term prognosis, the burden of HU was under-reported compared with hypertensive emergencies. Therefore, we conducted a study to investigate the prevalence of HU and related determinants among the population of Central-Jakarta, Indonesia.

**Materials and Methods**: We did population-based retrospective study enrolling 82,626 subjects >18 years old (y.o) who consecutively visited primary health care and community-based integrated health center (IHC). Data of blood pressure (BP), body mass index (BMI), age, sex, personal (PH) and family history (FH) of determinants including smoking, diabetes mellitus, stroke, CAD, and dyslipidemia were obtained using standardized protocol and analyzed using SPSS. HU was defined if systolic BP>180 mmHg and/or diastolic BP>120 mmHg without end-organ damage.

**Results**: The prevalence of HU was 1.1%. Only 50% of those had already known the prior diagnosis of hypertension. The prevalence of HU was 3.4% among chronic hypertension. The total prevalence of hypertension was 30.8%, including 14.7% of untreated hypertension, 9.9% of treated uncontrolled hypertension, and 6.2% of treated controlled hypertension. Multivariate analysis showed that odds for HU increased along with increasing BMI (obese: OR=1.9, p<0.0001; severe obese: OR=3.5, p<0.0001, p-trend<0.001), age (OR=2.7, p<0.0001, p-trend<0.001), and presence of FH of hypertension (OR=3.2, p<0.0001). Stratified analysis showed that the odds was higher in women aged ≥45 y.o (OR=2.8, p<0.0001), with obese (OR=2.04, p<0.0001), and severely obese (OR=4, p<0.0001). In contrast, men with FH of hypertension (OR=3.8, p<0.0001) had higher odds compared to women. Age and BMI were significantly correlated with SBP, DBP, and MAP (r=0.181-0.28, p<0.0001).

**Conclusion**: This study revealed the HU was common and accounted for 1.1%. Increasing BMI, age, and FH of hypertension were significant determinants for HU among the population of Central-Jakarta. Community-based IHC can improve the detection of HU and hypertension, hence the important role of IHC in hypertension management must be maximized by community empowerment.

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**Late-breaking (Coronary Heart Disease)**

**P080**

**SEX DIFFERENCES IN PREDICTORS OF CORONARY ARTERY DISEASE: EVIDENCE FROM A LARGE POPULATION-BASED STUDY IN CENTRAL JAKARTA, INDONESIA**

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**Objectives**: Coronary artery disease (CAD) represents the second leading (9%) of mortality in Indonesia with 138,400 death annually. Indonesia with more than 267 million of the population has limited data about cardiovascular disease (CVD) predictors, therefore we initiated a study to identify clinical predictors of CAD among the population of Central Jakarta City, Indonesia.

**Materials and Methods**: A population-based retrospective study was conducted involving 87,895 participants aged between 15 and 99 years old (y.o) located in Central Jakarta City. We collected data of blood pressure, body mass index (BMI), age, sex, personal (PH) and family history (FH) of risk factors including smoking, diabetes mellitus (DM), stroke, CAD, dyslipidemia, and hypertension using standardized protocol. Data were analyzed using SPSS.

**Results**: Prevalence rate of CAD was 1.06% (male:1.12%, female:0.13%). Premature CAD (15-45 y.o) accounted for 0.48%. The mean age of participants was 42.1±16.4 y.o. Multivariate analysis showed that odds for CAD were associated with increasing age (OR=4.3, p<0.0001, p-trend<0.001), BMI (OR=1.3, p<0.05, p-trend<0.05), male (OR=1.4, p<0.0001), presence of FH of CAD (OR=7.2, p<0.0001), and DM (OR=1.9, p<0.0001, PH of DM (OR=2, p<0.0001), hypertension (OR=3.7, p<0.0001), and dyslipidemia (OR=1.4, p<0.0001). The area under the ROC curve of the disease risk model showed good discrimination (0.85, p<0.0001). Stratified analysis showed that odds of CAD was higher among female with PH of DM (OR=2, p<0.0001), and increasing age (OR=4.9, p<0.0001) compared to male. Conversely, male with FH of CAD (OR=7.7, p<0.0001) and PH of hypertension (OR=4.4, p<0.0001) has higher odds of CAD compared to female. The odds also increased after menopause (OR=1.7, p<0.05).

**Conclusion**: Increasing age and BMI, male, FH of CAD and DM, PH of DM, dyslipidemia, and hypertension were independent predictors for CAD among the population of Central Jakarta City, Indonesia. Public health initiative engaging community should be escalated to prevent the burden of CAD.

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