Poster Exhibition

7. Other Comorbidities of Obesity and Metabolic Syndrome

PE 07-01 7. Other Comorbidities of Obesity and Metabolic Syndrome

How Spouses Influence Metabolic Syndrome

Kayoung Lee

Department of Family Medicine, Inje University Busan Paik Hospital, South Korea

Background: There is little known about the influence of shared lifestyle behaviors on the concordance of chronic diseases in couples. The present study assessed the association of spousal metabolic syndrome and lifestyle behaviors with their own metabolic syndrome in Korean couples.

Methods: Using data from the Korea National Health and Nutrition Examination Survey 2019-2021, 1824 couples with complete data including metabolic syndrome parameters, sociodemographic information, health behaviors, and nutritional information for both spouses were included in the study. The analysis was performed using general linear model and logistic regression.

Results: In 10.7% of couples, both partners had metabolic syndrome, with the highest concordance rate for hyperglycemia (28.7%) among the components of metabolic syndrome. Couples had 52.6-88.9% concordance in sociodemographic characteristics, 1.3-39.7% concordance in health behaviors, and 3.7-16.3% concordance in nutritional status. In multivariate analysis, the odds of having metabolic syndrome in both partners were 1.04-1.52 times higher with increasing mean age of the couple, both having poor subjective health, and both consuming excessive carbohydrates, whereas the odds were 26-38% lower with both having higher education and regular strength exercise. When considering their own factors and spouse's metabolic syndrome, the odds of having a husband or wife with metabolic syndrome were higher with increasing mean age of the couple, having a spouse with metabolic syndrome, their own poor subjective health, and their own smoking. The odds of the husband having metabolic syndrome increased by his alcohol consumption and sedentary behavior, but decreased by his strength exercise and adequate protein intake. The odds ratio of the wife having metabolic syndrome was increased by her excessive carbohydrate intake, but decreased by her alcohol consumption and regular strength exercise. When considering both the husband's and wife's characteristics together, the odds of having metabolic syndrome increased with the average age of the couple, the presence of metabolic syndrome in the spouse, and their own poor subjective health, but decreased with their higher education and regular strength exercise. The odds ratio for metabolic syndrome was increased in husbands by their spouse's smoking and in wives by their own and their spouse's excessive carbohydrate intake. The odds of having metabolic syndrome in wives were decreased by higher spousal education, subjective poor health of the spouse, and increased sedentary behavior of the spouse.

Conclusion: The results suggest that concordant social factors, health behaviors, and nutritional status in couples are associated with concordant metabolic syndrome in couples, and that these factors and the metabolic syndrome of the spouse are associated with the metabolic syndrome of the individual.

PE 07-02 7. Other Comorbidities of Obesity and Metabolic Syndrome

Role and relationship between vitamin D and arterial stiffness in non-dialysis-dependent chronic kidney disease in old aged patients

Ranbir Singh, Vinod Sharma

Department of Applied Sciences, Shri Maha maya vaishnav devi mandir research institute, India

Background: The role of vitamin D in the prevention and treatment of diseases associated with aging has not been well studied. With the discovery of vitamin D receptors in the nervous, cardiovascular and endocrine systems, the role of vitamin D and its impact on these systems has become an important area of research. Vitamin D deficiency is common in chronic kidney disease (CKD) in old aged population. This study aimed to investigate the association between vitamin D and arterial stiffness in patients with non-dialysis-dependent CKD (CKD ND) in old aged patients.

Methods: In present study, 140 patients aged ≥68 years with CKD ND were divided into two groups: vitamin D deficient (25(OH)D<20 ng/ml) and vitamin D non-deficient (25(OH)D≥20 ng/ml). Brachial-ankle pulse wave velocity (baPWV), a good marker for arterial stiffness, was calculated.

Results: The prevalence of vitamin D deficiency was 78.1% and the mean concentration of 25(OH)D was 18±8 ng/ml. 25(OH)D inversely correlated with baPWV. Multiple linear regression analysis showed that vitamin D level was independently associated with baPWV in patients with CKD ND (P<0.001). The model accounted for 48% of total variance of baPWV.

Conclusion: Vitamin D deficiency is common in CKD ND, and a low 25(OH)D level is significantly associated with increased arterial stiffness in old aged patients.

PE 07-03 7. Other Comorbidities of Obesity and Metabolic Syndrome

Self-Management Support Needs and Priorities for Metabolic Syndrome: An Importance-Performance Analysis

Chun-Ja Kim[1], Moonsun Kim[1], Dae Jung Kim[2], Elizabeth A. Schlenk[3]

[1]College of Nursing and Research Institute of Nursing Science1, Ajou University, South Korea
[2] Department of Endocrinology & Metabolism, Ajou University School of Medicine, South Korea
[3]School of Nursing, University of Pittsburgh, Pittsburgh, PA, USA

Background: Purpose: This study aimed to analyze the difference in the importance and performance of the educational content and identify the needs and priorities of patients at risk for metabolic syndrome participating in a comprehensive self-management support program.

Methods: This study analyzed baseline data in an ongoing longitudinal study conducted on 211 patients taking medication for metabolic syndrome from a university-affiliated hospital in South Korea. A 10-point, 13-item Revised Lifestyle Evaluation Scale for Metabolic Syndrome asked about the importance and performance of content in a self-management support program. Needs and priorities were examined through an importance-performance analysis (IPA), the Borich needs assessment, and the locus for focus model.

Results: The average of importance and performance of the content for a self-management support program were 9.15 (SD 0.40) and 6.69 (SD 1.60) out of 10, respectively. Except for regular follow up (visiting hospital), the average scores for the importance of all educational items were statistically significantly higher than the scores for performance (ps < .001). The IPA identified the items that needed focused effort as 'self-monitoring blood pressure', 'blood sugar test', 'diet control', 'physical activity', and 'symptoms/complications management'. The results regarding the priorities of educational needs using the Borich needs assessment and the locus for focus model showed that the highest priorities were 'diet control' and 'physical activity' followed by 'weight control' and 'symptoms/complications management'.

Conclusion: Overall, high importance and low performance indicate a need for improvement in a self-management support program for metabolic syndrome. Since the demand was high in lifestyle modification and symptoms/complications management, various supports are urgently needed to strengthen a self-management support program in the future. These results can be used as evidence for developing a comprehensive self-management support program for patients at risk for metabolic syndrome that reflects the patients' needs and priorities. *This work was supported by the National Research Foundation of Korea grant funded by the Korea government (MSIT). (No. 2021R1A2C2007858).

PE 07-04 7. Other Comorbidities of Obesity and Metabolic Syndrome

The Atherogenic Index of Plasma is associated with Handgrip Strength in Elderly Women with Obesity – A Nationwide Study in Korea

Hea Lim Choi[1,2]

[1] Department of Family Medicine/Executive Healthcare Clinic, Severance Hospital, Yonsei University College of Medicine, Seoul, Republic of Korea
[2] Department of Clinical Research Design and Evaluation, The Samsung Advanced Institute for Health Sciences & Technology (SAIHST), Sungkyunkwan University, Seoul, Republic of Korea

Background: The worldwide obesity prevalence has increased among the elderly. Age-related changes of body composition include increase in body fat mass and decrease in muscle mass – leading to sarcopenic obesity. These changes are more prominent in elderly women than elderly men. This study aims to investigate whether the handgrip strength (HGS) is associated with the atherogenic index of plasma, a novel index for cardiovascular disease, among Korean elderly women with obesity.

Methods: We analyzed data of 1430 Korean women age of > 65 years obtained from the seventh Korean National Health and Nutritional Examination Survey (KNHNES). The elderly women with BMI >25 were grouped into obese group. We categorized the atherosclerotic index of plasma (AIP) values into quartiles and defined low muscle strength as HGS less than 16.80kg. We used analysis of covariance (ANCOVA) to compare adjusted mean HGS and the multivariate logistic regression to calculate the odds ratios (ORs) and 95% confidence intervals (CIs) for low muscle strength according to the AIP quartiles.

Results: The AIP value was significantly higher in obese group than non-obese group (0.43 vs 0.35, P<0.001). Mean handgrip strength of the highest AIP quartile was significantly lower than that of the lowest AIP quartile in obese group (Q1: 21.59kg, Q4: 18.39, P<0.001), but the differences were statistically insignificant in non-obese group. In obese group, the OR of low muscle strength was significantly greater in the highest AIP quartile than in the lower AIP quartiles (Q1: OR ref., Q2: OR 2.136, Q3: OR 4.443, Q4: OR 4.580).

Conclusion: Higher AIP value was associated with reduced handgrip strength in the elderly women with obesity. Clinicians should pay attention to elderly women with low muscle strength and obesity for increased cardiovascular disease risk.

PE 07-05 7. Other Comorbidities of Obesity and Metabolic Syndrome

Uneven Mealtime Protein Distribution, Lower Sun Exposure and Physical Activity are Determinants of Sarcopenic Obesity among Community-Dwelling Older Adults in Malaysia

Hui Xin Ang[1], Yoke Mun Chan[1,2,3], Jaren Lee[1], Kai Xin Lu[1], Sazlina Shariff Ghazali [4], Mohammad Sallehuddin Hakimah[3,5]

[1]*Department of Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia*
[2]*Research Centre of Excellence Nutrition and Non-communicable Diseases, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia*
[3]*Malaysian Research Institute on Ageing, Universiti Putra Malaysia, Malaysia*
[4]*Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia*
[5]*Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia*

Background: Increasing age is commonly associated with body composition changes, characterized by an increase in fat mass and a steady decrease in muscle mass. Such changes can lead to clinical and functional phenotypes, including sarcopenic obesity. Sarcopenic obesity poses significant health risks for older adults and is understudied in Malaysia.

Methods: This cross-sectional study aimed to determine the prevalence of sarcopenic obesity and its associated factors among community-dwelling older adults aged 60 and above in Klang Valley, Malaysia. Sarcopenia was ascertained according to the Asian Working Group on Sarcopenia criteria while obesity was defined using universal cutoff for waist circumference. Body Impedance Analysis (BIA) was used to measure skeletal muscle mass. Multivariable logistic regression analysis was employed to delineate the determinants of sarcopenic obesity.

Results: A total of 194 older adults with mean age (SD) of 69 (6) years old were recruited. The prevalence of sarcopenic alone and sarcopenic obesity were 18.6% and 12.4%, respectively. There were significant negative associations between components of sarcopenia namely hand grip strength ($r=-0.562$, $p<0.01$) and skeletal muscle mass index ($r=-0.471$, $p<0.01$) with waist circumference. In the multivariable logistic regression analysis, older age (OR = 2.47, 95% CI: 1.64 – 4.50), reduced sun exposure (OR = 3.28, 95% CI: 2.71– 6.23), lower level of physical activity (OR = 1.89, 95% CI: 1.56 –3.12) and uneven protein distribution across meals (OR = 1.74, 95% CI: 1.21–2.88) contributed to higher risk of sarcopenic obesity.

Conclusion: This study underscores sarcopenic obesity is prevalent among older adults and the modifiable nature of several risk factors. Recognizing the impact of sarcopenic obesity on health and well-being of older adults, further research is imperative to elucidate its mechanisms of action, optimize dietary and lifestyle interventions, and translate research findings into clinical practice.

PE 07-06 7. Other Comorbidities of Obesity and Metabolic Syndrome

The Role of Leucine Intake on Glycemic Control in a Type 2 Diabetic Obese Patient with Severe Burn Injuries: A Case Report

Nadhira Nuraini Afifa[1], Lily Indriani Octovia[1], Nurul Ratna Mutu Manikam[1], Dewita Nina Paramita[1], Aditya Wardhana[2]

[1]*Department of Nutrition, Faculty of Medicine Universitas Indonesia – Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia*
[2]*Department of Plastic Surgery, Faculty of Medicine Universitas Indonesia – Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia*

Background: The combination of obesity, type 2 diabetes mellitus (T2DM), and burn injuries leads to pronounced hyperglycemia, increasing morbidity and mortality rates. Recent studies have shown that leucine improves glycemic control. This case report aims to evaluate the impact of leucine intake on glycemic control in a type 2 diabetic obese patient with severe burn injuries.

Case: A 47-year-old obese female (BMI 27.2 kg/m^2) was admitted to the High Care Unit (HCU) with 36% Body Surface Area (BSA) burns and uncontrolled T2DM. Upon admission, her fasting blood glucose (FBG) level was 426 mg/dL. She was hospitalized for 21 days. The average leucine intake was 81±29.1 mg/kgBW/day and average energy intake was 23±10 kcal/kgBW/day. She was hemodynamically stable, with controlled FBG levels, and her basal insulin was gradually reduced until completely withdrawn on day-17. Her mean FBG level reached 158±91 mg/dL. A significant negative correlation ($r = -0.67$, $p = 0.012$) was observed between leucine intake and FBG levels. No hospital-related malnutrition or sepsis signs were observed. The patient was discharged in stable condition with no insulin required.

Discussion: Leucine improves glycemic control by enhancing insulin sensitivity and inhibiting hepatic gluconeogenesis. The patient's leucine intake was about double the recommended amount. Zhang et al. demonstrated that doubling leucine intake significantly lowers FBG levels in mice. Similarly, Jiang et al. showed that high leucine intake improves glucose metabolism by increasing glucose transporter type 4 (GLUT4) expression in muscle and reducing adiposity through increased phosphorylation of adenosine monophosphate-activated protein kinase (AMPK).

Conclusion: Doubling leucine intake in a type 2 diabetic obese patient with severe burn injuries helped improve glycemic control and reduced insulin requirements. Further research is needed to determine the optimal leucine dosage and its long-term effects on glycemic control in such patients.

Conclusion: leucine intake, type 2 diabetic obese patient, burns

PE 07-07 7. Other Comorbidities of Obesity and Metabolic Syndrome

Usefulness of Relative Handgrip Strength as a Predictor of Incident Chronic Kidney Disease According to Gender: A Cohort Study in Koreans

Sung-Bum Lee[1,2], and Jong-Koo Kim[3,4*]

[1]Department of Family Medicine, Soonchunhyang University Bucheon Hospital, Bucheon, Republic of Korea,
[2]Department of Medicine, Graduate School, Yonsei University Wonju College of Medicine, Wonju, Republic of Korea,
[3]Department of Family Medicine, Yonsei University Wonju College of Medicine, Wonju, Republic of Korea,
[4]Institute of Global Health Care and Development, Wonju, Republic of Korea

Background: Handgrip strength (HGS) is an indicator of many diseases such as pneumonia, cardiovascular disease and cancer. HGS can also predict renal function in chronic kidney disease (CKD) patients, but the value of HGS as a predictor of new-onset CKD is unknown

Methods: 173,195 subjects were recruited from a nationwide cohort and were followed for 4.1 years. After exclusions, 35,637 participants remained in the final study, and CKD developed in 1062 individuals during the follow-up period. Lifestyle, anthropometric and laboratory data were evaluated in relation to the risk of CKD.

Results: The participants were subdivided into quartiles according to relative handgrip strength (RGS). Multivariate Cox regression demonstrated that RGS was inversely associated with incident CKD. Compared with the lowest quartile, the hazard ratios (HRs) [95% confidence intervals (CIs)] for incident CKD for the highest quartile (Q4) was 0.62 (0.45 – 0.86) after adjusting for covariates in men, 1.03 (0.69 – 1.56) in pre-menopause women and 0.92 (069 – 1.24) in post-menopause women. The incidence of CKD decreased as RGS increased. The receiver operating characteristic (ROC) curve showed that baseline RGS had predictive power for new-onset CKD. Area under the curve (AUC) (95% CIs) was 0.597 (0.571 – 0.623) in men, 0.506 (0.468 – 0.545) in pre-menopause women and 0.541 (0.513 – 0.568) in post-menopause women. Kaplan Meier curve found that trends in the difference for cumulative incidence of CKD according to baseline RSG quartiles remained unchanged in men and post-menopause women during follow-up time.

Conclusion: This is the novel study demonstrating that RGS is associated with incident CKD in both men and women. The relationship between RGS and incident CKD is more significant in men than in women. RGS can be used in clinical practice to evaluate renal prognosis. Regular measurement of handgrip strength is essential to CKD detection especially in men.

PE 07-08 7. Other Comorbidities of Obesity and Metabolic Syndrome

Association Between Sarcopenic Obesity and Arterial Stiffness in Korean Adults

Hyerang Bak[1]

[1]Family medicine, Samsung Changwon hospital, South Korea

Background: This study investigated the association between sarcopenic obesity and arterial stiffness using bioelectrical impedance analysis.

Methods: This retrospective cross-sectional study included 20,601participants who visited the health promotion center of the university hospital from January 2016 to December 2023. Sarcopenia was defined using height-adjusted appendicular skeletal muscle mass [(ASM/height2) <7.0 in men and <5.7 women] by bioelectrical impedance analysis (BIA). Obesity was defined using BMI or waist circumference. Arterial stiffness was measured using brachial-ankle pulse wave velocity (baPWV). The participants were divided into four groups: normal, obesity, sarcopenia, and sarcopenic obesity. The baPWV values were compared among four groups to examine the associations between sarcopenic obesity and arterial stiffness using adjusted multivariate analyses.

Results: The mean baPWV of the sarcopenic obesity group was significantly higher (P<0.001) than that of the other groups. Compared to the normal group without sarcopenia or obesity, the odds ratio (95% CI) for the sarcopenic obesity group was 2.40 (1.07-5.38) after adjusting for age, sex, smoking, exercise, heavy alcohol, hypertension, dyslipidemia.

Conclusion: Sarcopenic obesity is significantly associated with increased arterial stiffness.

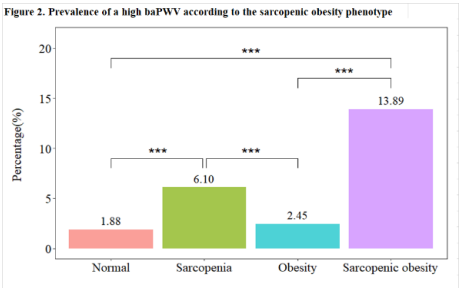


Table 2. Comparision for baPWV according to the sarcopenic obesity phenotype

	Model 1		Model 2		Model 3	
Variable	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Normal	reference		reference		reference	
Sarcopenia	2.11 (1.63, 2.73)	<0.001	2.12 (1.64, 2.74)	<0.001	2.19 (1.69, 2.85)	<0.001
Obesity	1.26 (1.02, 1.55)	0.031	1.25 (1.01, 1.53)	0.037	1.03 (0.83, 1.27)	0.805
Sarcopenic obesity	2.85 (1.26, 6.46)	0.012	2.81 (1.24, 6.37)	0.014	2.40 (1.07, 5.38)	0.033

PE 07-09 7. Other Comorbidities of Obesity and Metabolic Syndrome

Relationship between Obesity and Iron Deficiency among Children: A Scoping Review

Shao Hui Chong[1], Su Peng Loh[1]

[1]Department of Nutrition, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

Background: Obesity, which ranked as the fifth leading cause of mortality worldwide, is a low-grade inflammatory chronic illness that negatively affects public health. While obesity is undoubtedly a condition, it also leads to the onset of new ones and aggravates ones that already exist, including iron deficiency (ID). Iron deficiency (ID) is the most common nutritional deficiency found in children, which cause them to have iron deficiency anemia (IDA). A higher prevalence of ID may be found in children with obesity. This review aimed to examine the relationship between obesity and iron deficiency among children.

Methods: A systematic search was conducted in PubMed and Scopus databases using the keywords 'iron deficiency', 'obesity', 'children'. This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) guidelines.

Results: A total of 2057 articles were obtained from the database search of which the scoping review identified 11 relevant research articles and were included for data extraction. It was found that children with higher BMI, overweight or obesity were at higher risk of iron deficiency. Lower serum ferritin and higher hepcidin level were found in obese children due to low-grade inflammatory condition, which contributed to iron deficiency.

Conclusion: A higher prevalence of iron deficiency was found in children with obesity, and overweight and obese children were at higher risk of iron deficient as compared to normal weight and underweight children. It has been suggested that hepcidin, a regulator of iron homeostasis act as a potential mediator of the association between obesity and iron deficiency, and further studies are warranted to understand the underlying mechanism and confirm the association in this review. The present findings will encourage health policy and planners to make health interventions, such as weight loss program to improve the poor iron status among obese children.

PE 07-10 7. Other Comorbidities of Obesity and Metabolic Syndrome

Metabolic Syndrome and Multiple Cholelithiasis in Young Adult: A Case Report

Tarafainy Basalamah[1], Diana Sunardi[1,2]

[1]Department of Nutrition, Faculty of Medicine, Universitas Indonesia
[2]Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Background: Cholelithiasis is typically uncommon in young adults, with a higher prevalence observed in females over 40 years old who are overweight and fertile. Recent reports indicate an increased incidence of the disease in younger adults. Besides genetic factor, a high-calorie diet with high fat and obesity are the most reasonable cause for gallstone formation. In such cases, long-term comprehensive management is certainly needed.

Case description: A 19-year-old man was hospitalized with upper abdominal pain triggered by consuming fatty foods, which had fluctuated for 8 months. There was a history of jaundice and light-colored stool. The patient's caloric intake exceeded 3000 kcal/day, with 38% composed of fat. His BMI was 33.6 kg/m2, abdominal circumference was 120 cm, and blood pressure was 142/88 mmHg, with a history of dyslipidemia. The BIA result showed increased fat mass (30%) and visceral fat (3.5 L). The patient underwent cholecystectomy, and a low-fat diet was prescribed to prevent symptoms of fat malabsorption. Before discharge, the patient received education focusing on a low-fat and high-fiber diet, daily exercise, and regular visits to the physician clinical nutrition specialist.

Discussion: Both obesity and metabolic syndrome are associated with cholecystitis. Chronic hypercaloric nutrition, especially a high-fat diet, increases cholesterol synthesis and secretion, heightens the risk of gallstones, as observed in this patient. Within eight days post-cholecystectomy, there was no sign of fat malabsorption. Small, frequent feedings with a low-fat and high-fiber in post-cholecystectomy and in metabolic syndrome, resulted in clinical and laboratory improvements.

Conclusion: Comprehensive nutritional intervention, including an individualized meal plan, is necessary to prevent further complications after cholecystectomy. A combination of a low-calorie diet and exercise is key to reducing body weight and preventing further complications related to metabolic syndrome

Conclusion: Obesity, cholelithiasis, metabolic syndrome

PE 07-11 7. Other Comorbidities of Obesity and Metabolic Syndrome

Prevalence and risk factors of metabolic dysfunction-associated fatty liver disease in Korean air force army inclusive of pilots: 2020-2022

Du Hyun Song[1], Boncho Ku[2]

[1] Department of Internal Medicine, Korean Air Force Aerospace medical center in South Korea
[2] Digital Healthcare Division, Korea Institute of Oriental Medicine in South Korea

Background: Recently, the importance of Metabolic Dysfunction-Associated Fatty Liver Disease (MAFLD) has been highlighted as an alternative to non-alcoholic fatty live disease (NAFLD). However, there is still a lack of sufficient research on MAFLD in the Korean population. Furthermore, there is a lack of studies on its characteristics of MAFLD within the military population. This study aims to investigate the prevalence of MAFLD and associated risk factors in the Air Force population aged over 40 years old, as well as within occupational group (non-pilots vs. pilots).

Methods: A total of 1044 subjects who underwent health checkups at Korean Air Force Aerospace medical center from January 2020 to December 2022 were categorized into non-MAFLD (N=728, 69.7%) and MAFLD (N=316, 30.3%). Demographic, anthropometrics, vital signs, biochemical and blood examination results were collected and compared between two groups. Independent risk factors associated MAFLD were investigated using multivariate logistic regression analysis.

Results: The body mass index (BMI, OR=3.23, 95% CI: 2.24-4.70), alanine aminotransferase (ALT, OR=1.81, 95% CI: 1.35-2.47), uric acid (UA, OR=1.48, 95% CI: 1.21-1.82), fasting plasma glucose (FPG, OR=1.35, 95% CI: 1.09-1.69), high-density lipoprotein cholesterol (HDL, OR=0.73, 95% CI: 0.57-0.93), low density lipoprotein cholesterol (LDL, OR=1.27, 95% CI: 1.04-1.56), albumin (ALB, OR=1.36, 95% CI: 1.06-1.75), triglycerides (TG, OR=1.30, 95% CI: 1.07-1.61), and regular exercise (OR=2.75, 95% CI: 1.10-7.31) were independently associated with MAFLD in total analysis group. In the non-pilot group, only BMI (OR=3.41, 95% CI: 1.76-6.96), diabetes (OR=8.32, 95% CI: 1.79-41.25), and ALT (OR=1.91, 95% CI: 1.03-3.59) were identified as independent factors associated with MAFLD. However, this lack of statistical detection is attributed to the small sample size of the non-pilot group. Overall, the strength of association between MAFLD and other risk factors was similar to that observed in the total analysis group. In the pilot group, BMI (OR=3.77, 95% CI: 2.35-6.19), UA (OR=1.83, 95% CI: 1.40-2.42), ALT (OR=1.98, 95% CI: 1.18-2.20), TG (OR=1.50, 95% CI: 1.09-2.10), and dyslipidemia (OR=7.97, 95% CI: 1.32-57.35) were independently associated factors for MAFLD. When comparing risk factors for MAFLD between non-pilots and pilots, the association magnitude of UA in pilots was statistically higher than that in non-pilots (OR=1.13, 95% CI: 0.79-1.60), as indicated by the odds ratio (difference between two ORs=0.71, $p < 0.001$).

Conclusion: There was a difference in the prevalence of MAFLD between pilot and non-pilot group. In particular, UA could be used to as a specific risk factor in pilots comparing with non-pilots.

PE 07-12 7. Other Comorbidities of Obesity and Metabolic Syndrome

Association of Cardiometabolic Components and Obesity with Risk of Colorectal Cancer: A Multicentric Matched Case-Control Study

Mahla Chambari[1], Vaidehi Ulaganathan[1*], Digsha Augundhooa[1], Mirnalini Kandiah[1], Baskaran Gunasekaran[2]

[1] Department of Food Science and Nutrition, Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia
[2] Department of Biotechnology, Faculty of Applied Sciences, UCSI University, 56000 Cheras, Wilayah Persekutuan Kuala Lumpur, Malaysia

Background: Colorectal cancer (CRC) is the third most prevalent cancer to be diagnosed and the second leading cause of cancer-related death. It shared several metabolic risk factors with cardiovascular disease and type 2 diabetes. Despite the link, it remains to be established how markers of cardiometabolic conditions are associated with the onset of CRC. The aim of this study is to determine the association between cardiometabolic components and the risk of colorectal cancer.

Methods: This case-control recruited 100 cases (individuals with CRC) and controls (individuals without cancer) from five local public hospitals. Blood was drawn and was tested for adiponectin, leptin, interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-α), plasminogen activator inhibitor-1 (PAI-1), and C-reactive protein (CRP) plasma concentration using standard laboratory techniques. Binary logistic regression was used to test the strength of the association between two or more cardiovascular disease biomarkers and CRC risk. SPSS version 26 was used for data analysis.

Results: Cases had significantly higher body fat percentage, waist circumference, and blood pressure. Biochemical results indicated higher fasting blood glucose, total cholesterol, and LDL in some cases, while HDL and Apo A1 were lower. The results of binary logistic regression showed that waist circumference (OR:1.98, 95% CI: 1.07 – 3.70), blood pressure (OR: 4.92, 95% CI: 2.57 – 9.45), fasting blood glucose (OR: 1.84, 95% CI: 1.03 – 3.31), total cholesterol (OR: 7.81, 95% CI: 3.51 – 17.38), HDL (OR: 3.83, 95% CI: 2.06 – 7.13), LDL (OR: 5.79, 95% CI: 2.25 – 14.88), APO A1 (OR: 2.34, 95% CI:1.15– 4.77), PAI-1 (OR: 2.34, 95% CI: 1.01 – 5.42) and C-reactive protein (OR: 13.23, 95% CI: 4.55 – 38.47) were significant associated with CRC. High BMI, high body fat, and high waist-hip ratio showed a non-significant direct association with the risk of CRC.

Conclusion: These findings underscored the importance of monitoring cardiometabolic health in the prevention and early detection of colorectal cancer. Integrating these parameters into clinical practice may improve risk assessment and management strategies for colorectal cancer.

PE 07-13 7. Other Comorbidities of Obesity and Metabolic Syndrome

Effect of Weight Loss on Metabolic Parameters in Adult Obese Patient: A Case Report

Fenny[1,2], Kristin Maekaratri[1]

[1] Departement of Nutrition, Hermina Grand Wisata Hospital, Indonesia
[2] Departement of Nutrition, Jakarta Nutrition Center, Indonesia

Background: Obesity is a major health problem that predisposes a person to developing of chronic diseases such as type 2 diabetes, non-alcoholic fatty liver disease. The prevalence of obesity is on the rise globally, including in Indonesia. This case report aims to describe physical and metabolic changes in a 22-year-old male patient with obesity and comorbidities who admitted to our polyclinic after a follow-up period of seven months.

Methods: A 22-year-old male patient visited our polyclinic with his mother because of increasing fasting blood glucose, lipid profile, and liver enzymes, and he wanted to lose weight. He had no other complaints. His eating behaviour and daily activities: skipping meals, eating processed food, and having sugar-sweetened beverages, no regular exercise. Patient was diagnosed with morbid obesity, non-alcoholic fatty liver disease, type 2 diabetes, and dyslipidemia. Patient received lifestyle modification therapy (healthy balanced diet and exercise plan) and pharmacotherapy consisting of vitamin D 1000 IU/day, orlistat 120 mg, α-cyclodextrine 1000 mg, and vitamin B6 20 mg, respectively, given twice a day, also metformin 500 mg three times a day from the internist. Patient did regular visit for 7 months. His weight, body composition, and metabolic parameters were detected as decreased/improvement (Table 1).

Results:

Table 1. Patient's anthropometric values and biochemical values

Anthropometric values	Before follow-up	After follow-up
Height (cm)	185	185
Weight (kg)	129.3	110.1
BMI (kg/m2)	37.8	32.2
Fat percentage	35.4	29
Fat mass (kg)	45.8	31.9
Skeletal muscle mass (kg)	79.2	74.2
Fat free mass index (kg/m^2)	24,4	22,8
Visceral fat level	17	14
Biochemical values		
Fasting blood glucose (mg/dl)	232	103
Cholesterol (mg/dl)	200	151
HDL-cholesterol (mg/dl)	33	37
LDL-cholesterol (mg/dl)	141	95
Triglyserid (mg/dl)	288	97
AST (U/L)	75	31
ALT (U/L)	102	29

A direct link is shown between weight loss and improvement in metabolic parameters such as blood glucose, lipid profiles, and comorbidities such as non-alcoholic fatty liver disease, type 2 diabetes.

Conclusion: Weight loss in obese patient is associated with metabolic changes, mostly favorable to improving the overall health of an individual.

PE 07-14 7. Other Comorbidities of Obesity and Metabolic Syndrome

Case report and literature review of 9 patients with obesity hypoventilation syndrome who required hospitalization for 10 years at a single institution

In Sun Goak, Yoo Jin Jin, Yu Ji Kim, Heung Yong Jin, Tae Sun Park, Kyung Ae Lee

Division of Endocrinology and Metabolism, Department of Internal Medicine, Jeonbuk National University Hospital, Jeonju, Republic of Korea

Background: Obesity-hypoventilation syndrome (OHS) is a serious complication associated with increased mortality in obese patients. However, its incidence and clinical characteristics are not well-documented.

Methods: This observational retrospective case series conducted using electronic medical records from single center, Jeonbuk National University Hospital. Patients aged 19 years or older hospitalized for obesity-related hypopnea (ICD code E66.2) from January 2014 to December 2023 were selected.

Results: The study included nine patients (3 men and 6 women). The mean age was 50.2 ± 16.3 years, and the mean BMI was 50.0 ± 13.1 kg/m2. All patients were classified as class III obesity. The underlying diseases included type 2 diabetes in seven patients, hypertension in seven, and both conditions in six. Three patients were on psychiatric medications: one for depression, one for mental retardation, and one for dementia. None had cerebrovascular disease before the diagnosis of OHS. One patient had hypertrophic cardiomyopathy; however, all patients exhibited normal ejection fraction on echocardiography. Only one patient had a history of endometrial cancer. Six patients had been hospitalized in the intensive care unit for mechanical ventilation. None had undergone bariatric surgery, and only two were administered liraglutide for obesity treatment. Two patients with the highest BMIs (>60 kg/m^2) died suddenly within 2 years of their OHS diagnosis (78.1 kg/m^2 and 62 kg/m^2, respectively).

Conclusion: In our study, OHS appeared to be more frequent in women, with all but two patients being between 35 and 65 years of age. The leading cause of death was an extremely high BMI. Considering that only 2 patients received obesity treatment, active intervention by clinicians is necessary for the treatment of severely obese patients. Therefore, both clinicians should be made aware of the high mortality rate associated with OHS and the critical importance of treating obesity.

PE 07-15 7. Other Comorbidities of Obesity and Metabolic Syndrome

Effects of Dietary Advanced Glycation End Products on Primary Dysmenorrhea

Pei-Chun Hu[1], Chi-Hao Wu[1]

[1]Graduate Programs of Nutrition Science, National Taiwan Normal University, Taiwan

Background: Dysmenorrhea, commonly occurring in women of reproductive age, can impact their daily lives and work performance. The hypothesis of primary dysmenorrhea is higher levels of prostaglandins in the uterus, which lead to inflammation. High-temperature processing in diet can increase the production of advanced glycation end products (AGEs), currently associated with obesity and capable of inducing inflammatory responses, thereby contributing to the onset of various diseases. To date, there has been no research exploring the correlation between dietary AGEs and dysmenorrhea.

Methods: This study comprised animal and human studies. In the animal experiment, C57BL/6J female mice were fed with low AGEs (L-AGE) and high AGEs (H-AGE) diets for 45 weeks. The uteri were collected, fixed in paraffin, and processed into sections for immunohistochemical staining. The human study was a cross-sectional study involving women of reproductive age with no gynecological history. Collected anthropometry, three-day dietary records, menstrual distress questionnaire (MDQ), short-form McGill pain questionnaire (MPQ), and visual analog scale (VAS).

Results: The animal experiment showed higher expression levels of AGE markers carboxyethyl-lysine (CEL) and receptors for AGE (RAGE) in the H-AGE group. The human study recruited 308 participants with an average age of 24 years, and an average VAS score of 4.6, indicating moderate pain. The VAS scores were categorized into mild, moderate, and severe levels. Moderate and severe dysmenorrhea participants consumed more AGEs under the same calorie intake compared to those with mild symptoms. Additionally, a significant positive correlation between dietary AGEs and VAS scores was observed under equivalent calorie intake.

Conclusion: Under equivalent calorie intake, dietary AGEs are one of the factors influencing female dysmenorrhea. Reducing dietary AGE intake may prevent the onset of dysmenorrhea in women.

PE 07-16 7. Other Comorbidities of Obesity and Metabolic Syndrome

Effects of Advanced Glycation End Products on Blue Light-Induced Retinal Damage in Mice

Ting-Yu Chen, Chi-Hao Wu

Graduate Program of Nutrition Science, National Taiwan Normal University, Taipei, Taiwan

Background: The modern lifestyle that uses electronic devices for a long time exposes the eyes to a greater extent of high energy short wavelength blue light (BL). Accumulation of advanced glycation end products (AGEs) in the human body, attributed to factors such as aging, diabetes, or highly processed foods, has been associated with oxidative stress and inflammatory responses upon binding with their receptor, receptor for AGEs, (RAGE). This cascade of events is implicated in the progression of metabolic syndrome and related chronic diseases.

Methods: The study aimed to investigate whether high-temperature processing high AGEs diet (H-AGE) exacerbates BL-induced retinal damage. Male ICR mice 9 weeks old were randomly assigned to five groups: control, H-AGE, BL, H-AGE + BL, and H-AGE + BL + ALT-711 (AGE inhibitor), the study durations were 12 and 28 weeks.

Results: Visual acuity and Hematoxylin & Eosin staining showed BL-induced damage at 12 weeks, while H-AGE exacerbated BL-induced damage at 28 weeks, which was alleviated by ALT-711. Immunofluorescence staining showed significantly increased expression of AGE-related proteins such as CML, CEL, and RAGE in H-AGE group compared with control and H-AGE + BL + ALT-711 groups. Significantly increased expression of DNA oxidative stress marker 8-OHdG in H-AGE and BL compared with control group, and significantly increased expression in H-AGE + BL groups compared with H-AGE and BL groups. Significantly increased expression of inflammation marker TNF-α in the BL and H-AGE + BL groups compared with than others. Significantly increased expression of p-NF-κB and TUNEL in the H-AGE + BL group compared with others.

Conclusion: High-temperature processing H-AGE diet leads to the accumulation of AGEs in the retina, potentially exacerbating BL-induced oxidative stress and inflammatory responses via interaction with RAGE, ultimately leading to apoptosis of photoreceptor cells and retinal damage.

PE 07-17 7. Other Comorbidities of Obesity and Metabolic Syndrome

Acute Kidney Injury due to Hypertensive Emergency in a Patient with Metabolic Syndrome: A Case Report

Vanessa Della Sandy[1], Jihan Dinahafira[2]

[1]General Practitioner, Karubaga Public Health Center, Indonesia
[2]General Practitioner, Semen Padang Hospital, Indonesia

Background: Metabolic syndrome (MS) is a collection of metabolic dysregulations that include insulin resistance, atherogenic dyslipidemia, central obesity, and hypertension. MS is linked with hypertension. A hypertensive emergency is defined as a rapid, significant increase in blood pressure accompanied by symptoms of organ damage, such as acute kidney injury. This study presents a case of acute kidney injury due to a hypertensive emergency in a patient with metabolic syndrome who presented at the emergency room (ER) of Karubaga Public Health Center (PHC) for primary care.

Methods: We reported on a 50-year-old woman with a history of obesity and uncontrolled hypertensive emergency, who was admitted to our primary care facility due to severe headache, flank pain, and reduced urine output. Laboratory tests revealed acute renal failure: serum creatinine (Scr 1.69 mg/dl, BUN 14.77 mg/dl), elevated total cholesterol, and triglycerides (TC 211.5 mg/dL, TG 242 mg/dL). Renal ultrasound showed normal kidney size. Urinalysis revealed nitrit (+), proteinuria (+3), and hematuria (+3). The patient was referred to the General Hospital of Karubaga for further intervention.

Results: Our evaluation showed that metabolic syndrome and uncontrolled hypertension are connected, complex, and time-dependent. Metabolic syndrome increases renal sympathetic nerve activity (RSNA), leading to heightened renal sodium reabsorption, while compensatory glomerular hyperfiltration contributes to hypertension and kidney damage in metabolic syndrome.

Conclusion: Metabolic abnormalities, prolonged obesity, dyslipidemia, and uncontrolled hypertension can cause acute kidney injury. Managing this complex clinical scenario effectively requires a multidisciplinary decision-making algorithm.

Keywords: Metabolic syndrome, hypertension, acute kidney injury

PE 07-18 7. Other Comorbidities of Obesity and Metabolic Syndrome

Relation between ABCG2 rs2231142 Variant and BMI with Hyperuricemia in Thai

Wanida Chuenta[1], Sivaporn Wannaiampikul[2]

[1]Department of Food Technology and Nutrition, Faculty of Technology, Mahasarakham University, Khamriang, Kantarawichai, Mahasarakham 44150, Thailand
[2] Department of Biochemistry, Faculty of Medicine, Srinakharinwirot University, Watthana, Bangkok 10110, Thailand

Background: Genetic variants and obesity are risk factors for hyperuricemia (HUA). The ABCG2 rs2231142 variant was identified from genome-wide association studies as one of the most crucial genetic variants for HUA in various ethnicities. However, no large-scale studies in Thailand have revealed this association. The objective of this study to determine the association between rs2231142 variant and HUA in Thai population.

Methods: A total of 597 participants of Thai ancestry aged 20-70 years were enrolled in this study. All participants provided physical information through questionnaires and underwent anthropometric measurement, blood drawing for biochemical and genotyping test. HUA was defined as a serum uric acid level >7.0 mg/dL in men, >6.0 mg/dL in women. The association and interaction between ABCG2 rs2231142 variants and related factors such as body mass index (BMI), lipid profiles on serum uric acid level were analyzed using the SNPStat webtool program and SPSS version 17.0.

Results: Our study revealed that 148 cases (24.79%) had HUA. The prevalence of HUA was 39.10% in men and 19.72% in women. The minor allele frequency (T allele) of rs2231142 in our study was 0.21. There was no association between rs2231142 variant and HUA in this study. We found a strong association between BMI and an increasing risk of being HUA (OR: 1.106, 95% CI: 1.064-1.149). Individuals carrying the G/T genotype had a significantly higher BMI than those with the T/T genotype ($p<0.05$). Interestingly, we did not observe any effects on interaction between rs2231142 variants and BMI on the increasing risk of HUA.

Conclusion: In summary, we did not observe any significant association between rs2231142 variants and HUA. However, we did identify a robust correlation between BMI and HUA risk, with each unit increase in BMI associated with a 10.6% higher likelihood of being diagnosed with HUA. Notably, individuals carrying the G/T genotype exhibited a significantly higher BMI compared to those with the T/T genotype. Interestingly, while investigating the interaction between rs2231142 variants and BMI on HUA risk, we did not find any discernible effects.

PE 07-19 7. Other Comorbidities of Obesity and Metabolic Syndrome

General and Central Obesity and its Associated Comorbidities in Gairsan, Uttarakhand, India

Mukul Mudit Dwivedi[1], Dr Abigail Lalnuneng[2]

[1]Department of Anthropology, University of Delhi, India
[2]1Department of Anthropology, University of Delhi, India

Background: Obesity-related comorbidities such as high blood glucose and hypertension significantly contribute to the development of cardiovascular disease, which is one of the leading causes of death. This study aims to assess the burden of obesity and its associated comorbidities, including hypertension and diabetes in Gairsan, Uttarakhand, India.

Methods: A cross-sectional study was conducted on 181 individuals (92 adolescents and 89 adults) in Gairsan, Uttarakhand, India. Data on weight, height, systolic and diastolic blood pressure, and blood glucose levels were collected directly from the participants after obtaining informed consent. Correlation analysis was performed to identify associated variables, followed by chi-square and regression analysis.

Results: The prevalence of general obesity was significantly higher among adults (30.3%) compared to adolescents (3.3%), indicating an increased risk of obesity with age. Among adults, the prevalence of central obesity was 32.6% based on WC, 48.4% based on WHR, and 50.6% based on WHtR, while it was approximately one-fourth of these rates among adolescents. Hypertension prevalence is alarming in both adolescent (48.9%) and adults (69.7%) while only 1 adolescent and 4 adults shows high blood glucose. WHR was significantly associated with blood glucose levels ($\chi 2 = 3.769$, $p<0.05$), and WHtR was significantly associated with hypertension ($\chi 2 = 4.326$, $p<0.05$). Additionally, odds ratio analysis revealed that the risk of having a high WHtR was 2.5 times significantly higher among individuals with hypertension.

Conclusion: General obesity (BMI) and central obesity (WC, WHR and WHtR) exhibit significant prevalence among adults. Concurrently, hypertension is notably high in both adolescent and adult populations. Implementing a comprehensive public health strategy to address central obesity has the potential to markedly reduce the prevalence of associated health risks, such as hypertension, and reciprocally, addressing hypertension can mitigate central obesity.

Table 1: Obesity and its Associated Comorbidities

Measures of Obesity	Adolescents (n = 92)	Adults (n = 89)
Frequency (Percentage)		
General Obesity		
Overweight	10 (10.9)	19 (21.3)
Obesity	3 (3.3)	27 (30.3)
Central Obesity		
High WC	23 (25)	29 (32.6)
High WHR	23 (25)	52 (48.4)
High WHtR	24 (26.1)	45 (50.6)
Hypertension	45 (48.9)	62 (69.7)
High Blood Glucose	1 (1.3)	4 (4.9)
Anaemia	30 (49.6)	37 (57.8)
Chi-square		
WHR & Blood glucose	Not Significant	3.769, $p < 0.05$
WHtR & Hypertension	Not Significant	4.326, $p < 0.05$
Odds Ratio		
WHR & Blood Glucose	Not Significant	Not Significant
WHtR & Hypertension	Not Significant	2.576 (1.045-6.351), $p < 0.01$

PE 07-20 7. Other Comorbidities of Obesity and Metabolic Syndrome

Sleep Quality, Diet Quality, and Weight Status of Young Adults Residing in Malaysia: A Comparative Cross-Sectional Study between COVID-19-Recovered Patients and Non-COVID-19 Patients

Farha Ainin Sofia Muzaffar[1] and Seok Tyug Tan[2]

[1]Department of Healthcare Professional, Faculty of Health and Life Sciences, Management and Science University, Selangor, Malaysia
[2]Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Selangor, Malaysia

Background: The COVID-19 pandemic may have impacted individuals' sleep quality, diet quality, and weight status. Therefore, this study aimed to compare the sleep quality, diet quality, and weight status of COVID-19-recovered patients and non-COVID-19 patients residing in Klang Valley, Malaysia.

Methods: Sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI), while diet quality was assessed through the Diet Quality Questionnaire (DQQ). Body weight before the pandemic was self-reported, whereas current height and weight were measured using the SECA 213 portable stadiometer and TANITA electronic scale, respectively. In addition, young adults were also required to report their COVID-19 diagnostic status based on the registered status on MySejahtera App.

Results: This cross-sectional study involved 271 young adults in Klang Valley (n female= 182, n male= 89, mean age= 21.45 ± 2.313 years), wherein 43.2% of the respondents were COVID-19-recovered patients. No significant difference in the PSQI score (t= 1.031, p= 0.303) was observed between COVID-19-recovered patients (7.65 ± 3.30) and non-COVID-19 patients (8.06 ± 3.28). In regards to diet quality, the Food Group Diversity Score (FGDS) attained by COVID-19-recovered patients (6.10 ± 2.15) was also comparable to that of non-COVID-19 patients (6.55 ± 2.27) (t= 1.627, p= 0.105). Interestingly, emerging findings also revealed that slightly more than half of the respondents (57.9%) gained weight due to the pandemic. Further analysis using Pearson's Correlation showed that there were no interaction effects between sleep quality, diet quality, and weight status of young adults regardless of their COVID-19 diagnosis status (COVID-19-recovered patients: r= -0.032, p= 0.733; non-COVID-19 patients: r= -0.057, p= 0.481).

Conclusion: Efforts should be made to raise public awareness of the importance of having good sleep quality, good diet quality, and healthy body weight.

Keywords: sleep quality, diet quality, weight status, COVID-19-recovered patients, non-COVID-19 patients, long COVID.

PE 07-21 7. Other Comorbidities of Obesity and Metabolic Syndrome

Association of the risk of hyperuricemia with rs75786299 and combination of metabolic parameters in the Thai population

Krittapat Angsuvapattanakul[1], Narongdej Rungruanchaiyaboon[1], Ingfar Soontarawirat Ph.D[2], Sivaporn Wannaiampikul Ph.D[1]

[1]Faculty of Medicine, Srinakharinwirot University, Thailand
[2]Faculty of Public Health, Burapaha University, Thailand

Background: Hyperuricemia is a metabolic condition associated with various health risks, including gout and cardiovascular diseases, influenced significantly by genetic factors such as urate transporter genes. The single nucleotide polymorphism (SNP) rs75786299 within SLC22A12 genes has been studied for its potential role in regulating uric acid levels. This research explores the association between the rs75786299 variant and hyperuricemia risk, alongside other metabolic parameters, within the Thai population.

Methods: This cross-sectional study was from Nakornnayork, Thailand, enrolling 596 participants from annual checkup. Single nucleotide polymorphism (wildtype: G/G, variation: G/A and A/A) was analyzed using TaqMan SNP Genotyping Assays by StepOnePlus® Real-Time PCR Systems.

Results: Results from the study revealed a predominant GG genotype frequency (99.16%) and a less frequent GA genotype (0.84%) among participants(n=596) from check.mp. While no statistically significant difference in uric acid levels was observed between GG (5.54 mg/dL) and GA (6.71 mg/dL) genotypes ($p = 0.069$), however significant associations were found with other metabolic factors. Specifically, individuals with hypertension exhibited higher uric acid levels compared to healthy (5.81 mg/dL vs. 5.44 mg/dL, $p = 0.004$), as did those with hypertriglyceridemia; TG ≥ 150 (6.12 mg/dL vs. 5.37 mg/dL, $p < 0.000$) and obese participants; BMI ≥ 25 (5.90 mg/dL vs. 5.27 mg/dL, $p < 0.000$). Conversely, impaired fasting glucose and diabetes mellitus group; fasting blood sugar level ≥100 did not show a significant association with uric acid levels.

Conclusion: These findings suggest that the genetic variation of rs75786299 does not significantly with uric acid level while the higher blood pressure, triglycerides and BMI, the more increasing uric acid level are notable factors associated in the Thai population.

PE 07-22 7. Other Comorbidities of Obesity and Metabolic Syndrome

The Genetic Variation of rs3825016 of SLC22A12 and Serum Uric Acid Levels: A Cross-Sectional Study

Kanathip Tangpornpisit[1], Pimnara Suksamai[2], Ingfar Soontarawirat PhD[3], Sivaporn Wannaiampikul PhD[4]

[1]Faculty of Medicine, Srinakharinwirot University
[2]Faculty of Medicine, Srinakharinwirot University
[3]Faculty of Public Health, Burapha University
[4]Faculty of Medicine, Srinakharinwirot University

Background: Hyperuricemia is a well-established risk factor for various diseases including gout and metabolic syndrome. Genetic factors are known to significantly influence uric acid levels, and the SLC22A12 gene, which encodes urate transporter URAT1, plays a critical role in renal uric acid reabsorption. Previous studies have suggested the relationship between genetic variation of SLC22A12 and risk of hyperuricemia. However, SLC22A12 with rs3825016 has not been identified as a potential genetic marker associated with serum uric acid levels.

Methods: We performed a cross-sectional study involving participants from Nakornnayork, Thailand, to determine the association between rs3825016 and serum uric acid levels among four groups: 1) hyperuricemia (HUA), 2) metabolic syndrome with hyperuricemia (MET/HUA), 3) metabolic syndrome (MET), and 4) healthy controls. Single nucleotide polymorphism (wildtype: C/C, variation: C/T and T/T) was analyzed using TaqMan SNP Genotyping Assays by StepOnePlus® Real-Time PCR Systems.

Results: Total of 598 participants were included. In MET (n=148), participants with C/T genotype displayed higher mean of serum uric acid levels compared to wildtype (9.25 vs 7.90 mg/dL). However, in the remaining group, participants with variant genotype tended to express lower serum uric acid levels than wildtype. As in MET/HUA (n=25), mean serum uric acid levels for the wildtype and variant genotypes were 8.99, and 8.61 mg/dL. Similarly to MET (n=74), mean serum uric acid levels in wildtype and variant genotype were 5.64 and 5.48 mg/dL. As well as in control group (n=351), mean serum uric acid levels were 5.15 mg/dL for wildtype, and 4.99 mg/dL for variant genotype.

Conclusion: There is no association between rs3825016 and serum uric acid levels among four groups. Genetic variation of SLC22A12 might be risk factor of hyperuricemia in previous studies, but it might not be for rs3825016 in Thai. However, further study with larger sample sizes are needed to confirm the association.

PE 07-23 7. Other Comorbidities of Obesity and Metabolic Syndrome

Machine Learning-Driven Discovery of Exosomal miRNA Signatures for Pulmonary Hypertension in Obesity-Related Metabolic Syndrome

Rifaldy Fajar[1], Prihantini[2], Andi Nursanti Andi Ureng[2], Roland Helmizar[2]

[1]Department of Mathematics and Computer Science, Karlstad University, Sweden
[2]Machine Learning for BioMedicine Laboratory, Bandung Institute of Technology, Indonesia
[3]Department of Pharmacy, Andini Persada College of Health Sciences, Indonesia
[4]Department of Internal Medicine, Baiturrahmah University, Indonesia

Background: Pulmonary hypertension (PH) is often missed in obese individuals with Metabolic Syndrome (MetS). The molecular connection between obesity, MetS, and PH remains unclear. This study examines how adipose tissue-derived exosomal miRNAs contribute to PH. Using machine learning, we aim to identify biomarkers and treatment targets for PH in these patients.

Methods: We analyzed data from 3,000 participants (aged 40-70, BMI ≥ 30) in the NIH Exosome Consortium. We focused on 1,000 with detailed five-year follow-up, including those who developed PH. Exosomes were isolated from serum, characterized, and miRNAs extracted and sequenced. We identified differentially expressed miRNAs after normalization. A hybrid machine learning model using Support Vector Machines (SVM) and Long Short-Term Memory (LSTM) networks was created. SVM identified baseline miRNA markers, and LSTM predicted PH onset by analyzing miRNA changes over time. The model was validated with 10-fold cross-validation and tested on the Framingham Heart Study dataset for robustness.

Results: We identified 15 key exosomal miRNAs significantly linked to PH development, including miR-126, miR-155, and miR-223. Also, miR-126 levels were 4.2 times higher in those who developed PH (95% CI: 3.8-4.6, $p < 0.001$). The hybrid SVM-LSTM model achieved an AUC-ROC of 0.94 for predicting PH within two years, with a precision of 0.91 and recall of 0.88, indicating high accuracy. The LSTM component effectively captured the miRNA expression changes over time, aiding in early prediction. In external validation with the Framingham cohort, the model maintained high performance with an AUC-ROC of 0.91, confirming its potential as a predictive tool for PH across different populations.

Conclusion: This study uses machine learning to identify miRNAs predicting PH in obese individuals with MetS. Key biomarkers enable early diagnosis and personalized treatment. The SVM-LSTM model tracks miRNA changes effectively, aiding PH management. Future work should validate these findings in larger cohorts.

PE 07-24 7. Other Comorbidities of Obesity and Metabolic Syndrome

Risk of Diabetes Related to Changes in Waist Circumference among Korean Adults

Yujin Chang[1], Hye Soon Park[1], Jung Ah Lee[1]

[1]Department of Family Medicine, Asan Medical Center, University of Ulsan College of Medicine, 88, Olympic-ro 43-gil, Songpa-gu, Seoul, Republic of Korea, 05505

Background: Central obesity, measured by waist circumference (WC), is an important risk factor of type 2 diabetes mellitus (T2DM). Whereas high WC is reported to increase the risk of T2DM, the effect of WC changes in individuals was not clearly established, especially in Korean adults. Therefore, the aim of this study was to investigate the relationship between changes in WC and the incidence of T2DM in Korean adults.

Methods: Using Korean National Health Information Database of the National Health Insurance Service from 2008 to 2019, we identified the onset of diabetes in individuals who are newly diagnosed with diabetes codes (E10-E14) during the enrollment period. The annual average of WC changes was calculated prior to DM diagnosis. To evaluate the risk of diabetes according the central obesity and annual changes of WC, hazard ratios (HR) and 95% confidence intervals (CI) are estimated using cox proportional hazard regression.

Results: The incidence of diabetes was approximately 1,491.5 per 100,000 person-years in total and increased with age in both sexes. Those with central obesity have higher risk to develop diabetes in both men (HR 1.16, 95% CI 1.12-2.10) and women (HR 1.07, 95% CI 1.03-1.12). Additionally, groups with more than a 2cm increment in WC increased the risk of diabetes across all BMI groups. Especially, those in the middle age group (40-59 years) with more than a 2cm increase in WC showed approximately four times higher incidence of diabetes in both men (HR 4.04, 95% CI 3.8-4.3) and women (HR 4.24, 95% CI 4.01-4.48).

Conclusion: The increase in WC was significantly related to a higher risk of diabetes in both sexes and across all age groups of Korean adults, regardless of BMI. In conclusion, the change of WC might be a reliable indicator to estimate the risk of diabetes incidence.

PE 07-25 7. Other Comorbidities of Obesity and Metabolic Syndrome

Beyond Muscle Mass: Physical Function as a Key Predictor of Fall and Fracture Risk in Sarcopenia and Sarcopenic Obesity

Haesung Lee[1, 2], Yoon Seo Hong[1], Jong-Hee Kim[1, 2, #]

[1] Major in Sport Science, Division of Sport Industry and Science, College of Performing Arts and Sport, Hanyang University, 222 Wangsimni-ro, Seongdong-gu, Seoul, Republic of Korea
[2] BK21 FOUR Human-Tech Convergence Program, Hanyang University, Republic of Korea
[#] Corresponding Author

Background: Sarcopenia, characterized by a loss of muscle mass and physical function, poses an increased fall risk, particularly when combined with obesity. This combination heightens fall risk more than either condition alone. Falls are a leading cause of fractures in the elderly, influenced by factors such as gender, genetics, lifestyle, and body composition. Recent studies have shown conflicting views on the relationship between muscle mass and fracture risk. This study aims to investigate the correlation between muscle mass and fracture risk in elderly populations and identify key factors that can predict fracture risk.

Methods: This study involved 51 elderly women, categorized into four groups: Normal (NG), Sarcopenia (SG), Obesity (OG), and Sarcopenic Obesity (SOG). Sarcopenia was diagnosed according to the criteria set by the Korean Working Group for Sarcopenia's (KWGS) and sarcopenic obesity was defined as the presence of sarcopenia combined with a body fat percentage ≥ 35%. Fracture risk was assessed using the FRAX algorithm, and bone mineral density (BMD) was measured using Dual-Energy X-ray Absorptiometry (DEXA).

Results: The SOG exhibited higher fracture risk, lower appendicular skeletal muscle index (ASMI), lower BMD, and reduced values in all physical function variables compared to the NG. Notably, the SOG showed significantly lower grip strength and slower TUG speed compared to the SG. ASMI did not correlate with BMD, fracture risk, or physical function variables. In contrast, physical function variables correlated with both fracture risk and BMD. A gait speed of less than 1m/s was associated with a 12.45-fold increase in the risk of hip fracture exceeding 3%, which is considered clinically significant.

Conclusion: Sarcopenic obesity increases the risk of fractures more than either sarcopenia or obesity alone. This elevated risk is primarily attributed to a decline in physical function rather than a decrease in muscle mass. Additionally, gait speed has been identified as a useful predictor of fracture risk. To effectively prevent fractures in individuals with sarcopenic obesity, exercise interventions aimed at improving gait speed are essential.

PE 07-26 7. Other Comorbidities of Obesity and Metabolic Syndrome

Effects of a heat-processed diet high in advanced glycation end products on skeletal muscle fiber transition in non-obese mice

Ying-Ying Li, Wan-Ju Yeh[*]

Graduate Program of Nutrition Science, National Taiwan Normal University, Taipei, Taiwan

Background: Metabolically obese normal weight (MNOW) means people in normal body weight (body mass index <25 kg/m^2) with increased body fat especially visceral fat. The amount and distribution of adipose tissue may alter skeletal muscle energy metabolism. Emerging evidence indicates that the prevalence of MNOW is increasing due to sedentary lifestyles and unhealthy dietary pattern. A study also shows a positive correlation between highly advanced glycation end products (HAGE) and abdominal obesity. However, the effect of long-term administration of the HAGE diet on skeletal muscle metabolism in mice remains unclear. Thus, the purpose of this study is to investigate the impact of long-term HAGE diet on adipose tissue and skeletal muscle metabolism in mice.

Methods: Male C57BL/6J mice (n = 30) were randomly assigned to two groups at three weeks of age: the control group and the HAGE group. The control group received a standard chow diet, while the HAGE group received a heat-processed diet. After conducting the wire hanging test, mice were sacrificed at 16, 32, and 48 weeks of age, corresponding to adolescence, early adulthood, and middle age in humans. Adipose tissue and skeletal muscle samples were collected for further analysis.

Results: In body composition, long-term HAGE diet did not have impact on body weight but increase visceral adiposity in mice. Result of H&E staining did not show muscle atrophy in all ages. However, a decline of average falling score was found in HAGE group at 32 and 48 week-old. Immunofluorescence staining revealed changes in the ratio of fast-twitch and slow-twitch fiber, suggesting that HAGE diet may lead to fiber transition in mice.

Conclusion: The long-term HAGE diet significantly increased visceral adiposity in mice while concurrently reducing muscle strength and endurance without inducing obesity, likely due to a transition in muscle fiber types.

PE 07-27 7. Other Comorbidities of Obesity and Metabolic Syndrome

Case Report: Management of Deep Venous Thrombosis in Obese Female With Type 2 Diabetes at Limited Resources Hospital

Aktaruddin Arief Santoso[1], Jessy Hardjo[1], Jennifer Susanto[1]

[1]Department of Internal Medicine, Ploso Public General Hospital, Indonesia

Background: Obesity is a predisposing factor of chronic venous insufficiency as well as venous stasis. Among diabetes patients, females appear to be associated with a higher relative risk increase in VTE than males, especially during perimenopause. It took proper comprehensive care to produce a positive clinical result.

Case description: A 50-year-old female presented with left leg swelling and pitting edema. Her BMI was 32. Well's Score DVT is 3. Laboratory result shows HbA1c 8.9%. Vascular ultrasound shows non compressible left femoral vein with thrombus. She was treated with Fondaparinux 7.5 mg s.c for 5 days, Warfarin started from 2 mg dose with target INR values of 2.0 to 2.5. Sitagliptin 100 mg, and glimepiride 4 mg also stocking compression. After seven days she was discharged from hospital and anticoagulants are given for up to six months with monitoring INR every week

Figure 1. Vascular ultrasound

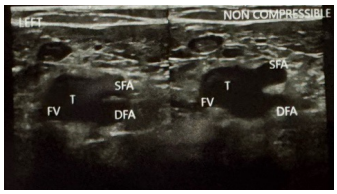
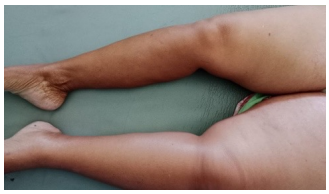


Figure 2. Clinical appearance.



Discussion: Patients with metabolic syndrome and diabetes could have a risk of vascular thrombosis because of associated endothelial dysfunction, increased platelet reactivity, and activation of the pro-inflammatory and pro-atherogenic mediators released by adipose cells. The cost and availability of direct oral anticoagulants is the limitation for venous thromboembolism treatment and in resource-limited settings. Warfarin use was associated with a significant decrease in total cost of care. However, with narrow therapeutic window, closely INR monitoring is required for warfarin. Glucose control also important for reduce vascular inflammation and prevent for recurrence.

Conclusion: The oldest and cheapest anticoagulant is warfarin. Warfarin works well but requires regular blood work. Newer anticoagulants do not require blood work to be done but are much more expensive. In resource-limited settings, warfarin still can be used for treatment deep vein thrombosis.

PE 07-28 7. Other Comorbidities of Obesity and Metabolic Syndrome

Polycystic Ovary Syndrome and Cardiometabolic Risk Factors in Young Adult Females in Delhi NCR

Apoorva Sharma[1], KN Saraswathy[2]

[1]PhD Research Scholar, Department of Anthropology, University of Delhi, India
[2] Professor, Department of Anthropology, University of Delhi, India

Background: Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder among women of reproductive age, characterized by irregular menstrual cycles, hyperandrogenism, and polycystic ovaries. PCOS is often associated with various metabolic and cardiovascular abnormalities. This study aims to compare the physiological variables between young adult females with and without PCOS in the Delhi NCR region to identify key health metrics that differ significantly between these groups.

Methods: A cross-sectional study design was employed, involving 1081 young adult females aged 18-25 years from the Delhi NCR region. Participants were categorized into PCOS and non-PCOS groups based on clinical diagnosis. Data were collected on Body Mass Index (BMI), blood pressure, waist circumference, Waist-Hip Ratio (WHR), Waist-to-Height Ratio (WHtR), and lipid profiles (total cholesterol, high-density lipoprotein, low-density lipoprotein, very low-density lipoprotein, and triglycerides). Statistical analyses, including chi-square tests and logistic regression, were conducted to determine significant differences and predictors of PCOS.

Results: The analysis revealed significant differences in BMI, waist circumference, WHR, WHtR, VLDL, and TG levels between the PCOS and non-PCOS groups. Obesity was more prevalent in the PCOS group (49.2% vs. 21.4%), along with higher rates of elevated waist circumference (45.9% vs. 23.2%), WHR (27.0% vs. 15.4%), and WHtR (51.5% vs. 28.9%). VLDL and TG levels were also significantly higher in the PCOS group (25.3% vs. 14.3% and 24.71% vs. 14.0%, respectively; $p<0.01$). Blood pressure, total cholesterol, high-density lipoprotein, and low-density lipoprotein levels did not show significant differences between the groups. Logistic regression identified obesity, high waist circumference, elevated WHR, WHtR, VLDL, and TG as significant predictors of PCOS.

Conclusion: The study underscores the importance of monitoring BMI, waist circumference, WHR, WHtR, VLDL, and TG levels in young adult females with PCOS. These physiological variables are significantly altered in the PCOS population and can serve as critical markers for early intervention. Targeted strategies to manage obesity and dyslipidemia are essential to mitigate the health risks associated with PCOS in young women in the Delhi NCR region.in the PCOS population.

PE 07-29 7. Other Comorbidities of Obesity and Metabolic Syndrome

Cluster Analysis of Nutritional and Lifestyle Factors Associated with Metabolic Dysfunction-associated Steatotic Liver Disease: Findings from the Korean Genome and Epidemiology Study

Jong Hee Lee[1], Ha-Eun Ryu[1], Seok-Jae Huh[2], Yu-Jin Kwon[1]

[1]*Department of Family Medicine, Yongin Severance Hospital, Yonsei University College of Medicine, Republic of Korea*
[2]*Department of Biomedical Systems Informatics, Yonsei University College of Medicine, Republic of Korea*

Background: As the global prevalence of metabolic-dysfunction associated steatotic liver disease (MASLD) continues to rise, early detection of MASLD is crucial. In addition to the predefined cardiometabolic criteria for MASLD, various factors such as age, dietary intakes, and lifestyle factors are closely linked to MASLD. However, recent studies have mainly focused on the impact of individual risk factors on MASLD development rather than considering the combined effects of various risk factors. Therefore, we aimed to investigate the combined effects of age, dietary intakes of carbohydrate, protein, and fat, physical activity, smoking status, and alcohol consumption on MASLD development, hoping to enhance current understanding of high-risk individuals for MASLD.

Methods: We assessed a total of 4,670 participants from the Korean Genome and Epidemiology Study. Cluster analysis was performed using the K-means clustering method to generate distinct clusters based on age, proportions of macronutrients intake, alcohol intake, smoking amount, and physical activity. Cox proportional hazard regression analysis was performed to assess the association between MASLD incidence and different clusters.

Results: A total of four clusters were generated, mainly characterized by the youngest age in cluster 1, the lowest carbohydrate intake in cluster 2, the highest age in cluster 3, and the highest alcohol intake and the highest amount of smoking in cluster 4, respectively. Cluster 3 and 4 showed significantly higher cumulative incidence rates of MASLD.

Conclusion: Distinct clusters exhibiting various risk-factor phenotype for MASLD were identified in this study, in which old age, smoking and alcohol consumption were significantly associated with a higher risk of MASLD. Our findings support the importance of early screening of high-risk groups for MASLD and the need for individualized approaches in managing MASLD.

PE 07-30 7. Other Comorbidities of Obesity and Metabolic Syndrome

Visceral Adiposity Index, Metabolic Syndrome as defined by the International Diabetes Federation Definition and Colorectal Cancer Risk in Malaysia

Thivyah Munisparan[1], Vaidehi Ulaganathan1[*], Mirnalini Kandiah[1], Baskaran Gunasekaran[2]

[1]*Department of Food Science and Nutrition, Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia*
[2]*Department of Biotechnology, Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia*

Background: The visceral adiposity index (VAI), which quantifies visceral fat dysfunction, is recognized as a key marker for non-communicable diseases including metabolic syndrome (MetS), and certain cancers. This study aims to evaluate the role of VAI as a biomarker of MetS and colorectal cancer (CRC) risk.

Methods: Histologically confirmed CRC patients and matched cancer-free controls (140:280) from five local hospitals were assessed for MetS based on the International Diabetes Federation (IDF) criteria. The VAI combines anthropometric measurements of body mass index and waist circumference with blood lipid parameters, namely triglycerides and high-density lipoprotein cholesterol. The data were analysed using SPSS. Multiple variable Cox regression analysis was used to measure the strength of the association between VAI, MetS, and CRC risk.

Results: The mean VAI was significantly higher among females ($t = 17.96$, $p < 0.001$) and was highest among Malays ($F = 6.42$, $p = 0.002$). VAI was significantly higher among subjects with MetS ($t = -0.919$, $p < 0.001$). Multiple Cox regression analyses showed that an increase in a unit of VAI significantly increases the risk of CRC by 28% (AOR = 1.29, 95% CI = 1.05, 1.58). The study showed MetS significantly raised CRC risk more than two-fold (COR = 2.25, 95% CI = 1.44-3.50) and independently nearly three-fold (AOR = 2.61, 95% CI = 1.53 - 4.47).

Conclusion: Both VAI and MetS were independently associated with the risk of CRC. Thus, VAI and MetS could be explored as cost-effective and convenient tools for CRC assessment in Malaysia population.

Keywords: Visceral adiposity index (VAI), Metabolic syndrome, Colorectal cancer (CRC), International diabetes federation (IDF)

PE 07-31 7. Other Comorbidities of Obesity and Metabolic Syndrome

Nonalcoholic Fatty Liver Disease Changes Linked to Hepatocellular Carcinoma Risk: A Nationwide Cohort Study

Sangmo Hong[1], Kyung-Soo Kim[2], Kyungdo Han[3], and Cheol-Young Park[4]

[1]Department of Internal Medicine, Guri Hospital, College of Medicine, Hanyang University, Republic of Korea
[2]Department of Internal Medicine, CHA Bundang Medical Center, CHA University School of Medicine, Republic of Korea
[3]Department of Statistics and Actuarial Science, Soongsil University, Republic of Korea
[4]Department of Internal Medicine, Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine, , Republic of Korea

Background: Nonalcoholic fatty liver disease (NAFLD) is an increasingly common cause of hepatocellular carcinoma (HCC). And NAFLD is reversible; however, the effect of changes in NAFLD status on HCC risk is unknown. We aimed to investigate the effects of changes and persistence in NAFLD status on HCC risk.

Methods: This nationwide cohort study included 1,050,476 adults without HCC cancer who underwent 2 consecutive biennial health screenings provided by the Korean National Health Insurance System between 2009 and 2012 and were followed up until 2017. The fatty liver index 30 and more was used as a diagnostic biomarker for NAFLD. Participants were categorized into the NAFLD-free, NAFLD-recovered, NAFLD-developed, or NAFLD-persistent group The primary outcome was newly diagnosed HCC using ICD-10 codes during follow-up until 31 December 2018. Cox regression analysis was used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs).

Results: Among subjects, 5,345 subjects (0.51%) were identified as having HCC, during 5.1 years median follow up. Compared with the NAFLD-free group, the NAFLD -persistent group had the highest risk of HCC (HR, 1.76; 95% CI, 1.64–1.88), followed by the NAFLD-recovered group (HR, 1.23; 95% CI, 1.12–1.36) and the NAFLD- developed (HR, 1.23; 95% CI, 1.10–1.39) after adjusting for potential confounders (P for trend <.001). The NAFLD-recovered group was associated with a lower risk of HCC than that in the NAFLD-persistent group (P < .001). The association between changes in NAFLD status and HCC risk differed according to age group. Compared with the NAFLD-free group, the NAFLD -persistent group had the highest risk of HCC in age 40 and over. The NAFLD-recovered group had the highest risk of HCC in age 60 and over. The NAFLD-developed group had the highest risk of HCC in age 70 and over.

Conclusion: In this study, recovering from NAFLD was associated with a reduced risk of HCC compared with persistent NAFLD, suggesting that HCC risk can be altered by changes in NAFLD status and cumulative exposure time of NAFLD status.

PE 07-32 7. Other Comorbidities of Obesity and Metabolic Syndrome

Association between steatotic liver disease (SLD) and gynecologic cancer: population-based study

Sangmo Hong[1], Kyung-Soo Kim[2], Kyungdo Han[3], and Cheol-Young Park[4]

[1]Department of Internal Medicine, Guri Hospital, College of Medicine, Hanyang University, Republic of Korea
[2]Department of Internal Medicine, CHA Bundang Medical Center, CHA University School of Medicine, Republic of Korea
[3]Department of Statistics and Actuarial Science, Soongsil University, Republic of Korea
[4]Department of Internal Medicine, Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine, , Republic of Korea

Background: It is unclear whether there is an association between steatotic liver disease (SLD) and gynecologic cancer. We investigated the association between steatotic liver disease (SLD) and gynecologic cancer in the general population.

Methods: This was a retrospective, observational, cohort study using data from the National Health Information Database from 2009 to 2018 and included 2,133,321 subjects, aged ≥40 years (premenopausal: 886,822 & postmenopausal: 1,246,499). We were divided into six groups based on steatosis status by fatty liver index(FLI), cardiometabolic risk factor, alcohol intake and concomitant liver disease; no steatosis (NS; FLI<30), metabolic dysfunction–associated steatotic liver disease (MASLD), metabolic alcohol-associated liver disease (MetALD), alcohol-associated liver disease (ALD), specific etiology SLD, and cryptogenic SLD. The primary outcome was newly diagnosed cervical, uterine, or ovary cancer using ICD-10 codes during follow-up until 31 December 2018. Cox regression analysis was used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs).

Results: Among subjects, 1,626,472 subjects (23.8%) were identified as having SLD [premenopausal: 121,784 (13.7%) & postmenopausal: 385,065 (30.9%)]. During the follow-up period (8.3 years), 1,879 (0.25 case/1000py) cervical, 1,822 (0.24 case/1000py) uterine and 2,448 (0.33 case/1000py) ovary cancer cases were identified in premenopausal subjects and 2,750 (0.27 case/1000py) cervical, 1,921 (0.19 case/1000py) uterine and 3,433 (0.33 case/1000py) ovary cancer cases in postmenopausal subjects. Comparing with NS, MASLD was associated with uterine (HR 1.17, 95% CI 1.46–1.84), and ovary (HR 1.22, 95% CI 1.09–1.37) cancer, and MetALD was associated with cervical (HR 1.87, 95% CI 1.21–2.89) cancer in premenopausal subjects. Among postmenopausal subjects, MASLD was associated with cervical (HR 1.12, 95% CI 1.03–1.22), uterine (HR 1.49, 95% CI 1.35–1.64), and ovary (HR 1.16, 95% CI 1.08–1.25) cancer comparing with NS. However, other SLD classes were not associated with gynecologic cancer.

Conclusion: In this large population study, MASLD was associated with higher risk of gynecologic cancer.

PE 07-33 7. Other Comorbidities of Obesity and Metabolic Syndrome

A Meta-Analysis Evaluating the Efficacy of Liraglutide in Reducing Cardiovascular Complications Among Patients with Type 2 Diabetes

Michelle Del Rosario[1], Celeste Ong-Ramos[2]

[1]Internal Medicine, De Los Santos Medical Center, Philippines
[2]Internal Medicine, Section of Endocrinology, St Luke's Medical Center, Philippines

Background: The objective of this study was to determine the efficacy of Liraglutide in reducing cardiovascular complications

Methods: Literature searches of electronic databases (PubMed and ScienceDirect) were performed to identify relevant studies. Relevant journals included were electronically searched for randomized controlled trials (RCTs) regarding the use of Liraglutide versus placebo in reducing the rate of cardiovascular complications. Data extraction and quality assessment were done by independent reviewers. Statistical analysis of the study was accomplished using Cochrane Systematic Review Software Review Manager. A p-value of less than 0.05 for the observed effect size was considered statistically significant.

Results: A total of 2 RCTs with 16, 977 patients were included in this meta-analysis. The results showed that in the Liraglutide group, there is a lower rate of the following: MACE (risk ratio of 0.86 [0.78, 0.95]), cardiovascular events (risk ratio 0.75 [0.63, 0.89]), and all-cause mortality (risk ratio 0.81 [0.70, 0.93]), but is not statistically significant when compared to the placebo group in terms of non-fatal myocardial infarction and non-fatal stroke. There is no significant difference in rates of severe adverse events in general ($p > 0.05$). However, Liraglutide caused significant reduction in rates of severe hypoglycemia as an independent secondary outcome ($p < 0.05$).

Conclusion: Compared with placebo, Liraglutide provided a significant reduction in MACE, cardiovascular events, all-cause mortality and severe hypoglycemia as an adverse event.

PE 07-34 7. Other Comorbidities of Obesity and Metabolic Syndrome

Relationship Between Non-Alcoholic Fatty Liver Disease On Sleep Quality, Anxiety, Depression And Quality Of Life In Among School Going Adolescent In Prayagraj City, India

Rohit Rajput

Department of Biochemistry, F H Medical College & Hospital, India

Background: Poor sleep has been linked to an increased risk of non-alcoholic fatty liver disease (NAFLD) and may exacerbate disease progression. Understanding the factors influencing sleep quality in NAFLD patients is crucial, as it can impact various aspects of life, and individuals with NAFLD often experience higher levels of depression and anxiety compared to others. Despite this, there is limited research on anxiety and depression associated with NAFLD, particularly in Asian populations. The aim of this study was to assess the frequency, magnitude, and significance of anxiety, sleep quality, and depression among school-going adolescents with NAFLD in Prayagraj City, India.

Methods: A cross-sectional survey was conducted among students in four classes (9th to 12th grades) across ten government schools in Prayagraj city, India. A section was randomly selected from each school for each grade using the lottery method. Forty students were chosen from each school, resulting in a total sample size of 470. This clinical trial study focused on NAFLD patients with mild-to-moderate symptoms, divided into case and control groups based on a hepatic steatosis index (HSI) value ≥36. Stress perception was evaluated using a stress perception rate. All participants completed self-administered questionnaires assessing symptom severity, the Hospital Anxiety and Depression Scale (HADS), and the NAFLD-specific quality of life (NAFLD-QOL) questionnaire.

Results: Among school adolescents, anxiety was observed in 32.1% of NAFLD patients compared to 26.6% of healthy subjects, while depression was observed in 34.5% of NAFLD patients compared to 17.2% of healthy subjects ($p<0.05$ for both). Both anxiety and depression were associated with self-reported symptom severity ($p<0.05$ for both). Multivariate analysis revealed symptom severity as the most significant predictor of anxiety and depression. Self-reported symptom severity and depression were independently associated with overall NAFLD-QOL scores. There was no significant association between NAFLD occurrence and meal frequencies over one week.

Conclusion: The findings underscore the importance of assessing anxiety and depression in NAFLD patients. Early and effective identification of these psychological factors is crucial for preventing the onset and progression of psychiatric disorders in individuals with NAFLD.

PE 07-35 7. Other Comorbidities of Obesity and Metabolic Syndrome

Adipose Tissue-Derived Extracellular Vesicles from Obese Mice Suppressed Splenocyte-Mediated Pancreatic Cancer Cell Death

Inae Jeong, Ok-Kyung Kim

Division of Food and Nutrition, Chonnam National University, Gwangju, 61186, Republic of Korea

Background: Obesity is a risk factor for pancreatic cancer and negatively contributes to the immune system. However, the mechanisms by which obesity mediates these actions are still poorly understood. Recent studies have demonstrated that extracellular vesicles are key mediators of communication between cells and may influence various aspects of cancer progression. We aim to explore the influence of extracellular vesicles (EVs) derived from adipose tissue of obese mice on cytokine production within the interactions between cancer cells and immune cells.

Methods: We isolated EVs from the adipose tissue of both C57BL6/J mice and Ob/Ob mice. Subsequently, we treated EVs with Panc02 cells, the murine ductal pancreatic cancer cell line, which were co-cultured with splenocytes. Viability and SMAD4 gene expression were examined in Panc02 cells, and cytokine concentrations of IL-6, IL-4, IL-12, and IL-12p70 were measured in the cultured medium.

Results: Interestingly, we observed a significant reduction in splenocyte-mediated Panc02 cell death when treated with EVs derived from the adipose tissue of Ob/Ob mice, compared to those from C57BL6/J mice. Additionally, EVs from Ob/Ob mice-derived adipose tissue significantly increased the levels of IL-4, IL-2, and IL-12p70 in the culture media of Panc02 cells co-cultured with splenocytes, compared to EVs from C57BL6/J mice-derived adipose tissue.

Conclusion: Adipose tissue-derived EVs from obese mice suppressed splenocyte-mediated Panc02 cell death and upregulated IL-4, IL-2, and IL-12p70 in cultured medium.

PE 07-36 7. Other Comorbidities of Obesity and Metabolic Syndrome

The Association Between Sarcopenia Severity and Metabolic Syndrome in Middle-Aged and Older Adults

Jeongran Ko[1], Junghoon Kim[1*]

[1]Sports and Exercise Medicine Laboratory, Graduated School of Sports Convergence, National Korea Maritime & Ocean University, Busan, Republic of Korea

Background: Metabolic syndrome (MetS) is associated with the high risk of cardiovascular disease, type 2 diabetes, and mortality. Sarcopenia is characterized by a decline in muscle mass and strength, and many studies have consistently reported an association between sarcopenia and MetS. However, most previous studies have focused on the relationship between muscle mass and MetS. There have been few studies on the association between sarcopenia severity and MetS. Therefore, we aimed to investigate the association between sarcopenia severity and MetS.

Methods: This study included 2,397 participants (1,061 male and 1,336 female) aged ≥45 years from the Korea National Health and Nutrition Examination Survey. MetS was defined as having ≥3 of risk factors. Pre-sarcopenia was defined as low muscle mass only, and dynapenia was defined as low muscle strength only. Sarcopenia was defined as the presence of both low muscle mass and low muscle strength. A survey logistic regression analysis was used to determine the association between sarcopenia severity and MetS after adjusting for covariates.

Results: The odds ratio (OR) for MetS was 1.71 (95% confidence interval [CI] = 1.07–2.73) in the sarcopenia group compared to the normal group (reference). Dynapenia (OR = 0.81; 95% CI: 0.55–1.19) and pre-sarcopenia (OR = 1.17; 95% CI: 0.83–1.64) groups were not significantly associated with an increased risk of MetS. In sensitivity analyses, only the sarcopenia group was significantly associated with an increased risk of MetS in men (OR = 3.57; 95% CI: 1.34–9.50) and older adults aged ≥65 years (OR = 1.64; 95% CI: 1.01–2.66).

Conclusion: Our study showed that sarcopenia was associated with an increased risk of MetS, but not with low muscle mass or strength alone. Therefore, our findings suggest that the combination of low muscle mass and low strength should be considered for the prevention of MetS.

PE 07-37 7. Other Comorbidities of Obesity and Metabolic Syndrome

Metabolic Syndrome in Infertile Women with Polycystic Ovarian Syndrome

Algirmaa Nisekhkhuu[1], Bolorchimeg Baldandorj[2], Munkhtsetseg Davaatseren[2], Altaisaikhan Khasag[2]

[1]Department of Infertility and Reproductive, National Center for Maternal and Child Health, Mongolia
[2]Department of Internal Medicine and Obstetrics Gynecology, Mongolian University of Medical Science, Mongolia

Background: Polycystic ovary syndrome (PCOS) affects 10–18% of women of reproductive aged women. Insulin resistance (IR) appears to be important in the pathogenesis of PCOS and subsequent metabolic syndrome. The prevalence of metabolic syndrome is as high as 33% in women with PCOS, and is associated with long-term consequences such as cardiovascular disease (CVD), diabetes type II, cancers, sleep apnoea and psychological problems. Conventionally, management of PCOS has focused on infertility, anovulation and hirsutism; thus, there is a need to increase clinicians' awareness of metabolic syndrome. The enormity of the health burden of metabolic syndrome means that accurate identification and timely intervention are extremely important. By detecting metabolic syndrome in infertile women with PCOS, they can reduce body weight before pregnancy and improve their health by correcting metabolic disorder. The aim of the present study was to determine the prevalence of metabolic syndrome (MS) in infertile Mongolian women with polycystic ovary syndrome (PCOS) using the IDF criteria.

Methods: We used the cross-sectional and case control study designs. Total 1340 infertility women enrolled in this study. Among 116 women with PCOS were found by Rotterdam's criteria at the Infertility and reproductive department, National Center for Maternal and Child Health, between December, 2018-2019. IDF diagnostic criteria for MS was used. The PCOS patients divided into following groups: (1) with MS (n=42) and (2) without MS (n=74)

Results: Among the 1334 infertile women studied, 8.5% (114) had a PCOS, of which 44.7% had Rotterdam 3 symptoms, the diagnosis was confirmed by following symptoms, 3.5% had oligo-anovulation and hyperandrogenism, 12.3% had hyperandrogenism and polycystic ovaries, 39.5% had oligo-anovulation cycles and polycystic ovaries. The average age is 28.7±4.1, primary infertility 57%, family don't have children 81.6%, overweight 34.2%, obesity 29.4%, oligo-anovulation cycle 80.7%, hirsutism 61.5%, acne 50.9%, and MS 36.8%. The mean of AMH (7.0±4.2 ng/ml, p=0.001) and the occurrence of MS (64.3%, p=0.01) were observed in women whose diagnosis was confirmed by Rotterdam 3 criteria. The variables including age (30.9±4.9), body mass (75.9±11.6kg) and also some metabolic parameters which is hypertension (133.6/88.4±13.6 mm Hg), WC (94.1±8.6 cm) and high triglyceride (1.8±1.0 mmol/l) were observed in MS group compared to without MS group.

Conclusion:

1. We found out that the prevalence of metabolic syndrome was 36.8 % among infertility women with PCOS.
2. The present this study found that women with PCOS who were diagnosed according to the three criteria of Rotterdam, a had much higher prevalence of metabolic syndrome than was conducted than other phenotype groups. Age, BMI, WC, amenorrhea, acne and acanthosis nigricans were highly related to metabolic syndrome.

PE 07-38 7. Other Comorbidities of Obesity and Metabolic Syndrome

Mobile Lifestyle Intervention with High-Protein Meal Replacement Improves Liver Function in Patients with Obesity and Metabolic dysfunction Associated Steatotic Liver Disease: A Pilot Randomized Controlled Trial

Eunbyul Cho[1], Sunwoo Kim[2], Soonkyu Kim[2], Ju Young Kim[3], Hwa Jung Kim[4], Yumi Go[3], Yu Jung Lee[3], Haesol Lee[3], Siye Gil[3], Sung Kwon Yoon[3], Keonho Chu[3]

[1]Department of Family Medicine, Seoul National University Bundang Hospital, South Korea
[2]Health Promotion Center, Seoul Bumin Hospital, Seoul, South Korea
[3]Bionutrion Corp. Seoul, South Korea
[4]Department of Clinical Epidemiology and Biostatistics, University of Ulsan College of Medicine, Seoul, South Korea

Background: While many studies have explored dietary substitutes and mobile apps separately, a combined approach to metabolic dysfunction-associated steatotic liver disease (MASLD) has not been investigated. This study evaluated short-term mobile interventions coupled with partial meal replacement in patients with MASLD.

Methods: Sixty adults with MASLD and a body mass index ≥25 kg/m^2 from a health examination center were randomized into an intervention group using a mobile app with partial meal replacements or a control group receiving standard educational materials. Liver enzyme levels, lipid profiles, and anthropometric measurements were assessed at baseline and after 4 weeks. Twenty-five participants in the intervention group and 24 in the control group completed the trial.

Results: Significant reductions were observed in the intervention group for alanine aminotransferase (-28.32 versus [vs.] -10.67, p = 0.006) and gamma-glutamyl transferase (-27.76 vs. 2.79, p=0.014). No significant changes in aspartate aminotransferase, body weight, or waist circumference were noted in the intervention group.

Conclusion: Four weeks of mobile lifestyle intervention incorporating partial meal replacements improved liver enzyme profiles in patients with MASLD. This strategy demonstrated the potential for mitigating elevated liver enzyme levels without altering body weight or waist circumference. Comprehensive and longer-term research is needed to substantiate and elaborate these preliminary outcomes.

PE 07-39 7. Other Comorbidities of Obesity and Metabolic Syndrome

Role of body mass index in cognitive impairment: Findings from a cross-sectional study in rural Punjab, India

Neha Yadav[1], Naorem Kiranmala Devi[1]

[1]Department of Anthropology, University of Delhi, India

Background: The association between Body mass index (BMI) and cognitive impairment (CI) is a critical area of public health research, particularly in regions with significant nutritional and socio-economic challenges. This study explores the direct relationship between BMI status and CI among the adult population in rural Punjab, India.

Methods: A cross-sectional study was conducted on a cohort of 1,206 individuals aged 18 and above including both the sexes. Data related to sociodemographic variables was collected by using pretested and modified interview schedule. Rowland Universal Dementia Assessment Scale was utilized (RUDAS) for cognitive evaluation. Standing height vertex and body weight were collected using anthropometer rod and digital weighing balance respectively. Body Mass Index (BMI) was calculated and categorized using Asia pacific cut-offs. Statistical analysis was performed using SPSS software version 22.

Results: Results indicated a significantly higher prevalence of CI was found among underweight individuals compared to those with normal, overweight and obese individuals. Binary logistic regression model, adjusted for potential confounders such as age, gender and education status, revealed that underweight individuals had 1.872-folds significant increased risk for having CI (p-value: 0.04). However, overweight and obesity were not found to be associated with CI in this population.

Conclusion: This association underscores the importance of addressing nutritional deficiencies as a potential modifiable risk factor for cognitive decline in ageing populations. The findings advocate for integrated nutritional and cognitive health interventions to mitigate the dual burden of malnutrition and CI in rural Punjab. Future research should focus on longitudinal studies to establish causality and explore underlying mechanisms linking underweight status to cognitive decline.

PE 07-40 7. Other Comorbidities of Obesity and Metabolic Syndrome

Metabolic Syndrome Increases the Risk and Neurologic Outcome of Moyamoya Disease

Joonyub Lee[1], MD, PhD; Seung-Hwan Lee[1], MD, PhD; Hyuk-Sang Kwon[2], MD, PhD; Mee-Kyoung Kim[2], MD, PhD; Jae-Seung Yun[3], MD, PhD; Kun-Ho Yoon[1], MD, PhD; Jae-Hyoung Cho[1], MD, PhD; Kyungdo Han, PhD[4]; Jang Won Son, MD, PhD[5]

[1]Division of Endocrinology and Metabolism, Department of Internal Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea
[2]Division of Endocrinology and Metabolism, Department of Internal Medicine, Yeouido St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea
[3]Division of Endocrinology and Metabolism, Department of Internal Medicine, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Seoul, South Korea
[4]Department of Statistics and Actuarial Science, Soongsil University, Seoul, Korea
[5]Division of Endocrinology and Metabolism, Department of Internal Medicine, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea

Background: Moyamoya disease (MMD) is rare disease with ill-defined etiology. Although metabolic syndrome (MetS) is highly associated with endothelial dysfunction in many organs, the correlation between MetS and the development and progression of MMD has not been studied.

Methods: This nation scale retrospective observational study was based on Korean National Health Insurance Service database from 2009-2012. From this database, 6,891,400 participants aged between 20-40 years were enrolled. The median follow-up period was 9.65 (Interquartile range: 8.55-10.24) years. The hazard ratio (HR) of MMD development and ischemic stroke event was measured by Cox regression analysis after adjusting age, sex, income, smoking, drinking, and regular exercise. The HR of MMD with respect to MetS was measured and subgroup analysis was performed based on sex.

Results: During the study period, 1,754 participants (incidence rate: 2.94 per 100,000 person year) developed MMD. People who developed MMD had different proportion of smoking status and higher proportion of female, diabetes, hypertension, dyslipidemia, and higher baseline Body Mass Index compared with those who did not developed MMD ($p < 0.0001$). Overall, the HR for the presence of MetS for developing MMD was 2.94 (95% CI: 2.60, 3.94). The risk of developing MMD stepwisely increased as the number of MetS components increased. Females had a higher MMD risk than males in every MetS components. Among newly diagnosed MMD, MetS was associated with an increased risk of ischemic stroke (HR 2.86, 95% CI: 1.50-5.45).

Conclusion: The presence of MetS is associated with the development and progression of MMD in Korean young adults

Keywords: Metabolic syndrome, Moyamoya disease