Poster Exhibition

6. Dyslipidemia, Hypertension and Obesity

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Application of a Metabolite Risk Score Model for Dyslipidemia in Koreans

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Background: Metabolites interact with diseases in a complex manner rather than acting in isolation. In this context, a metabolite risk score (MRS), which captures the collective impact of metabolites, offers a novel perspective on disease prediction. Therefore, the present study aimed to explore the predictive effects of MRS on dyslipidemia.

Methods: To construct and validate the MRS, discovery and validation sets were established, each comprising 50 healthy individuals (KCD code: Z00) and 50 dyslipidemia patients (KCD codes: E78.2 and E78.5). UPLC-MS/MS analysis was conducted for metabolomics. The MRS was developed with key dyslipidemia-related metabolites using a weighted approach based on standardized β-coefficient values from regression analysis.

Results: In the discovery set, 12 metabolites were selected based on VIP ≥1.5 and FDR-adjusted p-value <0.05. Among them, N-acetylisoputreanine-γ-lactam and eicosapentaenoic acid were revealed as key dyslipidemia-related metabolites. These key metabolites were used to construct the MRS with the equation of $\sum \beta_i M_i$, where β_i represents the standardized β-coefficient and Mi represents a score (0 or 1) for each key metabolite, determined by its cut-off value. In the discovery set, the MRS significantly predicted dyslipidemia and showed improved performance when combined with traditional markers (lipid profiles) (Fig. 1A). In the

validation set, the MRS predicted dyslipidemia with 76.1% accuracy, which increased to 86.0% when combined with lipid profiles (Fig. 1B). The results suggest that the MRS alone exhibited sufficient predictive ability (> 70.0%) in real-world settings, and its predictive ability was further enhanced with lipid profiles.

Conclusion: MRS is a proper tool for diagnosing diseases based on metabolite interactions. Further development through additional studies is necessary. Ultimately, MRS is expected to be practically applied to early disease diagnosis, facilitating easier disease management.
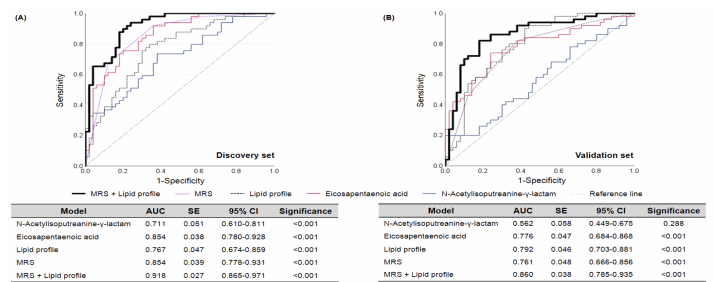

Model	AUC	SE	95% CI	Significance
N-Acetylisoputreanine-γ-lactam	0.711	0.051	0.610-0.811	<0.001
Eicosapentaenoic acid	0.854	0.038	0.780-0.928	<0.001
Lipid profile	0.767	0.047	0.674-0.859	<0.001
MRS	0.854	0.039	0.778-0.931	<0.001
MRS + Lipid profile	0.918	0.027	0.865-0.971	<0.001

Model	AUC	SE	95% CI	Significance
N-Acetylisoputreanine-γ-lactam	0.562	0.058	0.449-0.675	0.288
Eicosapentaenoic acid	0.776	0.047	0.684-0.868	<0.001
Lipid profile	0.792	0.046	0.703-0.881	<0.001
MRS	0.761	0.048	0.668-0.856	<0.001
MRS + Lipid profile	0.860	0.038	0.785-0.935	<0.001

Figure 1. Prediction abilities of the key metabolites, lipid profiles, MRS, and combination of MRS and lipid profiles for dyslipidemia.

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Assessment of Anti-Hypercholesterolemic Effect of *Liberica Coffee* pulp Yogurt in Female Sprague Dawley Rat's Models

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Background: Hypercholesterolemia is considered one of the leading causes of death around 2.6 million deaths every year globally which is contributing to an increasing number of people dying due to heart attack or stroke. Nowadays people seeking a lot of treatment or alternative way to reduce the cholesterol in body. The purpose of this study is to study the effectiveness of consuming *Liberica coffee* (LC) pulp yoghurt on hypercholesterolemia induced in female rats.

Methods: The LC pulp was obtained from University Putra Malaysia, was grounded and extract using Moka pot method. Yogurt was then prepared using full cream milk cooperated with LC pulp. Rats was divided into six different group which is control group (G1) with normal diet, negative control I (G2) with high cholesterol diet (HCD), negative control II (G3) with HCD and plain yogurt, positive control (G4) with HCD and 20mg/kg simvastatin, low dose (G5) with HCD and 8.6mg/100g LC yogurt and lastly high dose (G6) with HCD and 25.6 mg//100h LC yogurt daily for 8 weeks. End of week 8 all rats was culled; blood and tissue were collected for further studies.

Results: The results showed that the G6 group rats have the significant (p<0.05) lowest body weight and calorie intake compare positive control group. This is correlated to reduction of organ weight as well. For lipid

profile, total cholesterol level in G6 group show significant reduction (p<0.05) compared to other treatment groups. Kidney and liver profile show no significant changes across all group. Histology of liver and kidney also show no remarkable changes among all group. However, visceral fat from G2 and G3 show hypertrophy cell compared to other group rats. The presence of caffeine in the yoghurt increases the concentration of calcium ion which causes a net reduction in the expression of lipid regulatory genes leading in a net increase in LDL-c clearance, that would eventually affect the adipose tissue formation along with the body weight of rat.

Conclusion: Overall, in this study LC pulp yoghurt with the highest dosage of at 25.7mg/100g has proven to be effective in reducing hypercholesterolemia. This suggest that even waste product of LC pulp can be used to reduced hypercholesteraemic, promoting both health and sustainability.
reduction. Furthermore, the nutritional education is regarded to be more beneficial when offered diet-only education with individual approach and long-term duration (more than 3 months). This finding provide support for the role of nutritional education in diabetes management, also stated the importance of establishing appropriate programs that have optimal outcomes for diabetes management needs to be carried out effectively.

Relations of Triglyceride and Health Characteristics of patients received with Percutaneous Coronary Intervention

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Background: Recently, the mortality of heart diseases being increased continuously. Especially mortality of coronary artery diseases had 44.7% among heart diseases. Annually, percutaneous coronary intervention(PCI) applied for patients with coronary artery diseases increased and their complication increased also. Thus, health characteristics of patients with PCI seems have important factors seriously.

Methods: Data were collected using structured questionnaire with 132 patients with PCI in Pusan National University Hospital. The collected data were analyzed using descriptive statistics: t-test, ANOVA, Pearson Correlation Coefficients with the SPSS 28.0 program.

Results: The average age of the subjects was 63.50±5.85 and men accounted for 78.9%. There was a statistically significant difference in health behavior according to their level of education (t= -3.60, $p<.001$), average monthly income (t= -4.45, $p<.001$), comorbidity (t= -2.31, $p<.05$), triglyceride (t= -2.77, $p<.01$).
Health behavior showed statistically significant positive correlation with social support (r= .43, p< .001), self-efficacy (r= .59, p< .001).

Conclusion: Based on these results, we suggest that triglyceride, economic status, comorbidity, social support, and self-efficacy were considered for developing education program for PCI.

Protective effect of dapagliflozin on obesity related cardiac dysfunction in high fat high diet induced obesity in mice via modulating redox homeostatis and (PI3K)–Akt and AMPK-mTOR Signaling pathway signalling

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Background: A major risk factor for obesity, cardiac dysfunction, cardiovascular disease, and chronic heart failure, is a global health concern that is only becoming worse. An innovative class of hypoglycemic medications known as sodium–glucose cotransporter 2 inhibitors (SGLT2i) increases the excretion of glucose from urine and hence lowers blood glucose levels by specifically blocking the reabsorption of glucose and sodium from the proximal renal tubule. With its N-terminal domain suppressing oxidative stress and its COOH-terminal domain inhibiting mTOR, Sesn2 is a new stress-inducible protein. Seldom does it have kinase activity. Here, we tested the concept that dapagliflozin ameliorates obesity-related heart dysfunction by modulating the cellular antioxidant system and AMPK-mTOR signalling pathway by using the high-fat diet (HFD)–induced obesity model.

Methods: Following 12 weeks of high-fat diet (HFD) feeding, the mice were either administered with or without 10 mg/kg of dapagliflozin for a total of 8 weeks. Every week, food consumption and body weight (BW) were recorded. Body composition and metabolic profiles, including lipids, adipokine, glucose homeostasis, and plasma insulin, were assessed following an 8-week course of dapagliflozin treatment. Along with measuring mitochondrial reactive oxygen species, we also carried out a histological analysis.

Results: By administering dapagliflozin to HFD-fed mice, metabolic problems were alleviated and body weight and total body fat were decreased. Additionally, mitochondrial damage cardiac function, cardiac hypertrophy/fibrosis and cardiac fat buildup were all decreased by dapagliflozin. Furthermore, AMPK and endothelial nitric oxide synthase phosphorylation were both markedly elevated by dapagliflozin, although Akt and mTOR phosphorylation was suppressed. Sestrin2 levels were also dramatically enhanced. In mice given a high-fat diet (HFD), the positive benefits were somewhat reduced. Remarkably, dapagliflozin administration increased the oxidative stress response mediated by Nrf2/HO-1, indicating potential anti-inflammatory and antioxidant properties. As a result, by controlling AMPK-mTOR signaling and preserving redox balance, dapagliflozin ameliorated obesity-related cardiac dysfunction.

Conclusion: The cardiovascular protection of SGLT2i i.e dapagliflozin in obesity is explained by a new mechanism revealed by these studies. Because they offer viable treatment options for obesity-related cardiac dysfunction, these encouraging results will have a significant positive influence on the area of heart failure research.

Biological Potential Of β-sitosterol As Potent Angiotensin Converting Enzyme (ACE) Inhibitors With Their Anti-Hypertension Activity In Medicine

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Background: medicine for the treatment of human disorders due to their therapeutic potential and pharmacological activities. Medicinal plants play a vital role in the human health complications and have been used as source of food and medicine for centuries. Phytosterols is a steroidal compounds having similar structure of cholesterol and used as food supplements. β-sitosterol is the natural occurring phytosterols having steroidal moiety and cholesterol-lowering property.

Methods: Biological potential of β-sitosterol against angiotensin-converting enzyme has been investigated in the present work through scientific data analysis in order to develop better molecule from the natural sources for the treatment of hypertension and associated disorders. Different scientific data of β-sitosterol have been analyzed in order to know the therapeutic potential of β-sitosterol in medicine for their anti-hypertensive activity. However other scientific data were also analyzed to co-related with the other available pharmacological data of β-sitosterol in the scientific study to know their anti-hypertensive activity. Scientific data of molecular simulation studies of β-sitosterol with

angiotensin-converting enzyme have also been analyzed in the present work.

Results: Scientific data analysis of β-sitosterol revealed the biological potential and therapeutic effectiveness of β-sitosterol in medicine. Scientific data analysis signified that β-sitosterol could be used for the treatment of hypertension and other associated secondary complications. Further, scientific study also signified the importance of angiotensin-converting enzyme (ACE) in medicine for the treatment of hypertension. Scientific data analysis also revealed that β-sitosterol decreased serum total cholesterol, serum triacylglycerols and low-density lipoprotein cholesterol which justified their anti-atherosclerosis property. Further, β-sitosterol also reduced cholesterol levels by competing with cholesterol for absorption in the intestine and valuable for cardiovascular protection.

Conclusion: Present investigation scientific data revealed the antihypertensive potential of β-sitosterol and could be used as a candidate for the treatment of cardiovascular complications.

Association Between Adiposity Measures And Blood Pressure Among Adults In Klang Valley, Malaysia

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Background: public health, it is crucial to examine the relationship between adiposity measures and blood pressure for better prevention and treatment methods. This study aimed to explore the association between adiposity measures and blood pressure among adult in Klang Valley, Malaysia.

Methods: This cross-sectional study involved 249 adults (125 male; 124 female) aged between 18 and 30 years old. Standardized procedures were employed to determine anthropometric measurements, body composition, and blood pressure, while simultaneously gathering socio-demographic information from participants. Body mass index (BMI), waist-to-hip ratio (WHR), body adiposity index (BAI), and body shape index (ABSI) were calculated.

Results: Males exhibited higher body weight, height, waist circumference (WC), and systolic blood pressure (SBP) compared to females (p<0.001), along with higher WHR (p<0.01) and ABSI (p<0.05). Systolic blood pressure

(SBP) exhibited the highest correlation (p<0.001) with WC (r=0.48), and weaker correlations (p<0.05) were observed with body weight (r=0.39), BMI (r=0.27), ABSI (r=0.27), and BAI (r=0.21). Weak correlations (p<0.05) were observed between diastolic blood pressure (DBP) and WC (r=0.36), body weight (r=0.27), ABSI (r=0.22), BMI (r=0.19), BAI (r=0.18), and body fat percentage (%BF) (r=0.14). Participants with abdominal obesity had higher odds of being prehypertensive or hypertensive (adjusted odds ratio [aOR] 7.54; 95% CI 3.58, 15.88), followed by participants with overweight and obesity (aOR 2.02; 95% CI 1.02, 3.98) after adjusting for sex. Multiple linear regression showed WC was positively associated with both SBP and DBP.

Conclusion: The WC had the strongest predictive ability for both SBP and DBP. These findings highlight the critical importance of monitoring and addressing central adiposity in the prediction and management of blood pressure levels.

Diet Design for a Controlled-Feeding Trial to Determine Salt-Sensitivity of Blood Pressure in Middle-Aged Women

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Background: A low-sodium diet is often prescribed for managing hypertension, although its effectiveness is limited to about half of adherents, primarily those who exhibit salt sensitivity.[1] Controlled feeding trials are pivotal in establishing causal links between sodium intake and blood pressure and refining precision nutrition approaches to tailor dietary guidance to risk profiles within population subgroups. The design of menus constitutes a critical component of these trials. We aim to formulate two menu cycles for a randomized, two-arm crossover, controlled feeding trial to evaluate individual blood pressure responses to salt intake.

Methods: Using a practical manual design procedure, we created 7-day menu cycles for 1,600 and 2,000 kcal levels. These menus were designed to meet low sodium (1150 mg) and high sodium (5750 mg) targets predetermined by the outpatient reference method for assessing salt sensitivity.[2] Potassium content is held constant between diet versions. Food selections were based on commonly consumed foods in the region. Calorie levels will be prescribed based on individual energy requirements.

Results: Seven-day, 1,600, and 2,000 kcal, low-sodium menu cycles consisting of three meals and snacks daily were created. Menu selections

included foods that will be prepared in the teaching kitchen, commercially available pre-packaged frozen items, and sodium-free bottled water. The high-sodium menu consists of the low-sodium menu cycle (~1150 mg of sodium) supplemented with two bullion packets (2200 mg of sodium) to be mixed with water and salt packets added to prepared foods (2400 mg of sodium).

Conclusion: The developed two-week menus offer a standardized dietary plan for future controlled feeding studies to examine salt sensitivity in blood pressure. Documenting the diet and menu design procedures can enhance future study budgetary planning and consistency in implementing the dietary protocol across studies using the outpatient reference method.

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The Inadequacy of Body Mass Index: A Comparative Analysis of Obesity Indices and Their Association with Cardiometabolic Risk Factors in A Rural South Indian Population

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Background: Studies describing the 'Asian Indian Phenotype' have shown that Indians are at a higher risk of developing cardiometabolic diseases (CMD) despite lower BMIs compared to Caucasians. This study used a novel classification system that combines BMI with a central obesity marker and investigated its sex-specific associations with CMD.

Methods: We used baseline cross-sectional data (n=3,397) from the ongoing Srinivaspura Aging, Neuro Senescence and Cognition (SANSCOG) study, involving participants ≥ 45 years. Five obesity indices were used: Body Mass Index (BMI); Waist Circumference (WC) based on IDF, WHO, and ATP criteria; Waist-Hip Ratio (WHR); Waist-Height Ratio (WHtR); and visceral fat percentage (VFP). The overlap between central obesity indices and BMI was studied using Cohen's Kappa (K). Multivariate multinomial logistic regression was employed to analyze the association between obesity indices and CMD.

Results: Overlap among participants indicated that BMI showed fair agreement with VFP (female,K=0.367; male,K=0.308) and WC with IDF criteria (female,K=0.497; male,K=0.529), moderate agreement with WHtR (female,K=0.442; male,K=0.573), and poor agreement with WHR

(female,K=0.157; male,K=0.243). Across both sexes, a strong association was observed between CMD and abnormal BMI combined with any of the four central obesity indices studied (p<0.001). The odds of having diabetes (females:OR=8.98,CI=4.74-19.30;males:OR=6.77,CI=4.22-11.47), hypertension (females:OR=2.43,CI=1.61-3.74;males:OR=2.02,CI=1.42-2.90),and dyslipidaemia (females:OR=2.79,CI=1.27-5.81;males:OR=3.83,CI=2.27-6.39) were significantly higher in participants with abnormal BMI and abnormal WHR as compared to those with normal BMI and WHR (p<0.001). Normal-weight males with CMD had increased odds of having an abnormal WHR, especially in those with diabetes (OR=3.51,CI=2.14-6.04;p<0.001) and dyslipidaemia (OR=2.04,CI=1.22-3.37;p<0.01).

Conclusion: Our analysis demonstrated that combining WHR and BMI is significantly more effective than BMI alone in identifying high-risk groups for CMD in both sexes in the South Indian population. This combined metric is particularly useful in identifying the previously overlooked group with normal-weight obesity or 'occult obesity', providing a more accurate assessment of cardiometabolic risk in males.

6. Dyslipidemia, Hypertension and Obesity

The Correlation Between Metabolic Syndrome And Serum Ferritin Levels In Mongolian Men

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Background: It was hypothesized that the percentage of increased serum ferritin is high due to the fact that Mongolians consume iron-rich meat from sheep and cattle every day. Some study have shown ferritin is associated with various cardiometabolic risk factors such as dyslipidemia and insulin resistance in adults.

Methods: A cross-sectional study involved 610 men who underwent preventive examination of the institution from the Health preventive center, Erdenet Medical Hospital in 2022. We analyzed serum levels T-Chol, TG, HDL, LDL, GLU and evaluated them in relation to ferritin levels. The clinical characteristics of the groups were compared using Independent Samples test. Serum ferritin level ≥ 430 ng/ml in men, it was considered elevated. According to Mongolian guidelines for dyslipidemia, T-chol>5.2, Triglycerides>2.3, HDL<1.0, LDL>3.4 were considered abnormal and glucose >6.1 mmol/L was considered hyperglycemia.
According to the IDF classification, metabolic syndrome was classified.

Results: Serum ferritin levels were 419.75 ± 297.77 ng/ml. The percentage of elevated serum ferritin was 34.2%. Central obesity was 52.4 percent of all men, arterial hypertension was 26.9%, and metabolic syndrome was 21.8%. The percentage of dyslipidemia and hyperglycemia was higher in the group with elevated serum ferritin. In the group with elevated serum ferritin, 51.1 % of participants had a high TC level, 11.3 % had a low HDL level, 40 % had a high LDL level, 14.1 % had a high TG level and 23.3% had hyperglycemia. Metabolic syndrome was 28.9% in the group with elevated ferritin and 17.2% in the normal group, and there were differences between the two groups. (p=0.001). The mean serum ferritin level in the group of men with metabolic syndrome was 522.7 ± 32 ng/ml, while that in the group of men without metabolic syndrome was 390.6 ± 28 ng/ml.

Conclusion: Ferritin was higher in the metabolic syndrome group.

6. Dyslipidemia, Hypertension and Obesity

Exploring the Efficacy of Aspalathus linearis and Citrus bergamia in Combating Hypercholesterolemia and Obesity: Enzyme Inhibition, Antioxidant Activity, and Phytocompound Analysis

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Background: Hypercholesterolemia, characterized by elevated low-density lipoprotein cholesterol (LDL-C) levels, and obesity, defined by excess body fat accumulation, are significant health concerns. While statins and orlistat are the commonly used drugs to manage LDL-C, their long-term usage are associated with adverse effects. Consequently, there is a growing interest in herbal alternatives that may mitigate these conditions with less or no side effects.

Methods: This study investigated the biological activity of *Aspalathus linearis (A. linearis)* and *Citrus bergamia* (*C. bergamia*) extracts through in-vitro enzyme inhibition assays targeting HMG-CoA reductase, pancreatic lipase and cholesterol esterase. Antioxidant activities were assessed using DPPH, ABTS, and FRAP assays. High-Resolution Mass Spectrometry (HRMS) was employed to identify the phytocompounds present in these extracts.

Results: *A. linearis* and *C. bergamia* extracts demonstrated significant inhibitory effects on key-enzymes: 82% and 44.5% inhibition against HMG-CoA reductase, respectively; 62.46% and 56.91% inhibition against pancreatic lipase, respectively; and 70.94% and 84.90% inhibition against cholesterol esterase, respectively. The antioxidant activity of A. *linearis* and *C. bergamia* extracts, assessed via DPPH, showed IC_{50} values of 90.10 µg/ml and 260.4 µg/ml, respectively. The ABTS assay revealed IC_{50} values of 10.86 µg/ml and 37.92 µg/ml, respectively, while the FRAP assay showed IC_{50} values of 139.7 µg/ml and 370.1 µg/ml, respectively. Overall, extracts from A. *linearis* and *C. bergamia* exhibited high antioxidant activities in DPPH, ABTS, and FRAP assays. Based on HRMS analysis, A. linearis was found to contain 16 flavonoids, while *C. bergamia* contain 2 flavanols, 4 oxygen heterocycles, 1 limonoid, 1 flavone-O-glycoside, and 2 flavonoids.

Conclusion: The selected herbs, rich in diverse phytocompounds, demonstrated significant enzyme inhibition and antioxidant capacities, offering promising prospects in ameliorating hypercholesterolemia and obesity. Currently the ongoing research is focusing on in-silico molecular docking analysis and *in-vivo* studies, to elucidate the compounds accountable for the effects and to further explore their therapeutic applications.

The Association Between Body Mass Index, Hyperlipidemia, and Smoking with Graves Orbitopathy Incidence: A Systematic Review and Meta-Analysis

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Background: Graves' orbitopathy (GO) was associated with reduced quality of life and, ultimately, vision loss. The substantial morbidity linked to this disease should be reduced by emphasizing disease prevention, given the limited therapeutic options. We investigate the association between body mass index (BMI), hyperlipidemia, and smoking as risk factors for GO patients.

Methods: A literature search was performed in the PubMed database to retrieve studies. Patients with GO were included in this study. Relevant studies meeting defined eligibility criteria were selected and reviewed systematically according to the PRISMA flowchart and RevMan 5.4 was used for data analysis. BMI, hyperlipidemia, and smoking were considered as exposure, and incidence of GO was considered as outcome.

Results: There were 678 articles throughout 2019-2024 in the database. Five articles with 7871 patients were included for meta-analysis after screening for duplication with inclusion and exclusion criteria. Our analysis showed that higher BMI (mean difference [MD]: 1.29, 95% confidence interval [CI] 0.01–2.57; I2: 87%) and hyperlipidemia (odds ratio (OR): 2.64, 95% CI 0.19–36.02; I2: 71%) were associated with higher chance to develop GO in GD patient, although this had high heterogeneity among the studies. Smoking was associated with higher risk to develop GO in GD (OR: 1.87, 95% CI 1.34–2.62; I2: 33%), with low heterogeneity among the studies.

Conclusion: We found that higher BMI, hyperlipidemia, and smoking could increase the risk of GO. Furthermore, higher BMI in overweight and obesity patients, hyperlipidemia and smoking habits should be modified to prevent or lower the risk of GO in GD patients.

Keywords: body mass index, Graves orbitopathy, hyperlipidemia, incidence, risk factor, smoking

Case Study: Self-Awareness in Weight Loss Management Enhance Improvement in Metabolic Parameter

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Background: Metabolism is a dedicated network of enzyme and metabolite-derived mechanism that is hallmark of life activities. Weight loss is associated with metabolic changes, mostly favorable to improving the overall health of an individual. Although many individuals attempt to lose weight, not everyone achieves optimal success. Self-awareness of current weight and metabolic condition can help an individual prevent more weight gain and severe metabolic problems.

Methods: A 38 year old obese female was selected to conduct the study that suffering from hypertension and dyslipidemia for the last 2 years, and also in current laboratory findings there was increasing HbA1C parameter. The patient was given a healthy balanced diet meal plan including 120 mg orlistat twice daily and diethylpropion 25 mg twice daily. After month of medication and healthy proper balanced diet, patient exhibited 10% of body weight with a little bit of uncomfortable side effect of the medication. In the second month, without the medication, patient intensively continue the healthy proper balanced diet with adequate protein intake 1-1.2 g/bw/day. We measured the primary outcome variables are body weight, blood pressure, waist circumference, HbA1C, and cholesterol level.

Results: The Patient exhibited 10% and 15% of body weight in the first and second month, respectively. After successful manage 25% weight loss in two months patient also demonstrated improvement in blood pressure (decrease from 160/100 mg/dL to 120 mg/80 mg/dL) and waist circumference (decrease 8%). Additionally, from laboratory parameters patient exhibited 22% of HbA1C and 8% of cholesterol serum level.

Conclusion: Balance diet with adequate protein intake can effectively normalize metabolic parameter after significant of loss of body weight. Self-awareness is a major factor for weight loss. As the physician, we need to explore the patient awareness and behavior to get the suitable therapy.

PE 06-13 6. Dyslipidemia, Hypertension and Obesity

Involvement of endocan in vascular dysfunction in angiotensin II-induced hypertensive mice

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Background: Hypertension is a major risk factor for cardiovascular disease and a leading cause of death worldwide. Vascular endothelial dysfunction plays an important role in the initiation and maintenance of hypertension. Endocan (endothelial cell-specific molecule-1), a soluble proteoglycan primarily expressed in endothelial cells, has recently been found to have elvated in serum of hypertensive patients. Clinical studies suggest that this elevation may be associated with endothelial dysfunction in hypertension. However, there is insufficient research data on the involvement of endocan in vascular dysfunction in hypertension. The aim of this study is to investigate the involvement of endocan in vascular endothelial dysfunction associated with hypertension and to explore its underlying mechanisms.

Methods: Eight-week-old male C57BL/6 mice administered with normal saline or endocan (0.6mg/kg by intraperitoneal injection every two days) or angiotensin II (1000 ng/kg/min) by osmotic minipumps) for 4 weeks. Systolic blood pressure was determined using the tail-cuff system. After mice were sacrificed, the serum endocan levels were measured in all groups of mice using a mouse endocan enzyme-linked immunosorbent assay (ELISA) kit. Vascular function was investigated in mesenteric resistance arteries using a multi-wire myograph system. Human umbilical vein endothelial cells (HUVECs) was treated with angiotensin II at different concentrations (0, 0.01, 0.1, 1, 10 uM) for 24 hours.

Results: Administration of endocan significantly increased systolic blood pressure. Endothelium-dependent relaxation (EDR) was significantly reduced in the mesenteric resistance arteries from endocan-treated mice compared to vehicle-treated mice. However, there was no difference in vascular relaxation induced by sodium nitroprusside administration between the two groups. Furthermore, endothelium-dependent relaxation was significantly reduced in angiotensin II-induced hypertensive mice which was associated with increase in serum endocan level. Treatment of angiotensin II to HUVECs induced concentration-dependent elevation of endocan levels in cell culture medium and cell lysate.

Conclusion: In this study, we suggest that increase in circulating endocan level causes vascular dysfunction by impairing vascular relaxation, which may lead to elevated blood pressure.

PE 06-14 6. Dyslipidemia, Hypertension and Obesity

Double Burden of Malnutrition And Hypertension Among Bhil Tribe Of Jaisalmer, Rajasthan

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Background: Hypertension has emerged as a global health burden, specifically in developing countries. This burden is more noticeable among indigenous and tribal groups that were once considered to be less prone to such complex disorders. Malnutrition (undernutrition and overnutrition) poses enhanced risk for developing hypertension. Lifestyle, nutritional and epidemiological transitions among the tribal populations has increased the risk of hypertension among such populations. Simultaneous co-existence of undernutrition and overnutrition among tribal populations exemplifies obesity paradox. Therefore, the present study is an attempt to assess the burden of hypertension and malnutrition and their associated risk factors among Bhil tribal population of Rajasthan state, India.

Methods: The present study was conducted among 210 Bhil adults (84 males, 126 females), of Rajasthan, India. Waist Circumference (WC), Waist-to-Hip Ratio (WHR), Waist Height Ratio (WHtR) and BMI were measured using a standard protocol. Blood Pressure was obtained using an Automatic Digital Blood Pressure machine and categorised on the basis of American Heart Association (AHA) guidelines. Sociodemographic variables were collected using an interview schedule.

Results: The study reveals a high burden of hypertension (elevated blood pressure-11.7%, 27.7%-stage 1, and 12.6%-stage 2) and malnutrition (overweight/obese-34.78%) and undernutrition (22.7%). There is a significant association between WHR and hypertension (p-value 0.005). MUAC shows a strong positive correlation with systolic blood pressure (p-value < 0.001) after adjusting for sociodemographic variables. Individuals with high waist circumference have a fourfold increased risk of hypertension stage 2 (p-value 0.002).

Conclusion: These results highlight malnutrition as a potential risk factor for hypertension, emphasizing the need for targeted interventions to improve nutrition and reduce hypertension within this community. The study underscores the importance of culturally sensitive public health policies to address these health issues, ultimately aiming to enhance health outcomes and quality of life for the Bhil population.

Keywords: Blood Pressure, BMI, WC, WHR, WHtR, Bhil.

Hypertension Prevalence and Its Association with Sociodemographic and Lifestyle Factors: An Anthropological Study Among the Bhils of Jaisalmer, Rajasthan, India

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Background: Hypertension is one of the major risk factors for various cardio-metabolic diseases. In India, there is an increasing trend in hypertension prevalence among the general population and tribal populations. Several studies show that, sociodemographic and lifestyle factors such as physical inactivity, smoking, high salt intake, and excess alcohol consumption. This present study aims to determine the prevalence of hypertension and its association with Sociodemographic and Lifestyle Factors among the Bhills of Jaisalmer, Rajasthan.

Methods: A cross-sectional study encompassing a total of 151 participants, 55 Males, and 96 Females were recruited for this study. Data on all the socio-demographic and lifestyle variables, such as age, sex, education, literacy, marital status, physical activity, salt consumption, alcohol consumption, smoking, and green leafy vegetables were collected from the participants. Systolic and Diastolic blood pressure were obtained by using an automatic digital Blood pressure machine. Descriptive statistics and chi-square analyses were performed to determine the prevalence of hypertension and its association with sociodemographic and lifestyle variables. The data was analyzed in SPSS software version 22.

Results: The overall prevalence of hypertension among this tribal population is 58.6%. Among males, the prevalence was 80% which is significantly higher compared to their female counterparts (46.3%). males and 46.3 % of females are hypertensive. Further, Age (less than 35 years=49.2%; more than 35 years= 65.9%), Occupation (employed=50.9%; unemployed= 77.3%), smoking status (nonsmoker= 54.2%; smoker = 75.0%), salt consumption (consume extra salt= 97.5%; Don't consume extra salt=14.3%) is significantly associated with hypertension (Table 1).

Conclusion: The prevalence of hypertension in the present study is quite alarming, with more than half of the population affected. There is a critical need for targeted interventions and public health strategies to address hypertension within this demographic, with particular emphasis on high-risk groups identified by age, occupational status, smoking habits, and dietary practices.

Table1. Hypertension Prevalence and Its Association with Sociodemographic and Lifestyle Factors

Variable	Non- Hypertension N (%)	Hypertension N (%)	Chi-square value, P value
Age			4.212, 0.040
Less than 35 Years	33 (50.8%)	32 (49.2%)	
35 Years and above	29 (34.1%)	56 (65.9%)	
Sex			16.299, 0.000
Male	11 (20.0%)	44 (80.0%)	
Female	51 (53.7%)	44 (46.3%)	
Occupation			8.889, 0.003
Employed	52 (49.1%)	54 (50.9%)	
Unemployed	10 (22.7%)	34 (77.3%)	
Salt Intake			106.61, 0.000
Consume extra salt	2 (2.5%)	78 (97.5%)	
Don't consume extra salt	60 (85.7%)	10 (14.3%)	
Smoking			4.212, 0.040
Non- Smoker	54 (45.8%)	64 (54.2%)	
Smoker	8 (25.0%)	24 (75.0%)	

Obesity and Dyslipidemia among young adults of Delhi NCR, India.

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Background: Obesity is a well-established risk factor for dyslipidemia which contributes to cardiovascular diseases (CVDs). The prevalence of both obesity and dyslipidemia is rising globally and increasingly affecting younger populations as well. Therefore, this study aims to explore the association between obesity indices and the risk of dyslipidemia among young adults in Delhi, NCR, India.

Methods: The present study is a cross-sectional study carried out among 3375 college-going young adults from Delhi NCR, India. Data was collected on sociodemography and lifestyle variables. Obesity indices was determined by anthropometric measurements. Blood samples were collected and serum was separated for biochemical analysis. SPSS 22 was used for statistical analysis.

Results: Results: When examining the distribution of obesity indices in lipid variables, general obesity, as indicated by overweight/obese BMI, was significantly higher in individuals with high TC, LDLC, and high TG. Abdominal obesity, defined by high WC and high WHtR, was significantly higher in those with high TC, low HDLC, high LDLC, and high TG. Additionally, high WHR was significantly associated with low HDLC, high LDLC, and abnormal TG levels. Odds ratio analysis after adjusting for confounding factors (age and sex) reveal that Overweight/ Obese, high WC, high WHR and high WHtR are significantly associated with increased risk for high TC and high TG. Overweight/Obese also posed increased risk for low HDLC. High WC and high WHtR posed increased risk for high LDLC.

Conclusion: This study highlights the importance of understanding population-specific mechanisms of risk factors and underscores the need for targeted interventions and programs tailored for young adults to mitigate the risk of metabolic disorders and other comorbidities.

Table: Distribution and association of obesity indices with lipid variables in the study population

Obesity indices		TC Normal N (%)	TC At risk N (%)	p-value	OR (95% CI)	HDL Normal N (%)	HDL At risk N (%)	p-value	OR (95% CI)	LDL Normal N (%)	LDL At risk N (%)	p-value	OR (95% CI)	TG Normal N (%)	TG At risk N (%)	p-value	OR (95% CI)
BMI	Normal	1195 (70.1%)	42 (55.3%)	0.000*	reference	952 (70.1%)	288 (67.6%)	0.166	reference	1212 (69.9%)	27 (56.3%)	0.000*	reference	1091 (73.2%)	148 (50.9%)	0.000*	reference
	Overweight/Obese	510 (29.9%)	34 (44.7%)		1.886* (1.174-2.973)	407 (29.9%)	138 (32.4%)		1.315* (1.012-1.708)	523 (30.1%)	21 (43.8%)		1.775 (0.994-3.172)	400 (26.8%)	143 (49.1%)		2.591* (2.001-3.354)
WC	Normal	2223 (77.7%)	101 (65.6%)	0.001*	reference	1557 (79%)	769 (73.4%)	0.000*	reference	2266 (77.7%)	64 (61%)	0.000*	reference	1960 (80.8%)	364 (61.8%)	0.000*	reference
	High	639 (22.3%)	53 (34.4%)		1.529* (1.031-2.269)	413 (21%)	279 (26.6%)		0.798 (0.652-1.007)	651 (22.3%)	41 (39%)		2.0* (1.239-3.229)	467 (19.2%)	225 (38.2%)		2.279* (2.227-3.514)
WHR	Normal	1875 (65.6%)	59 (38.3%)	0.325	reference	1341 (68.1%)	631 (60.3%)	0.000*	reference	1916 (65.7%)	59 (56.2%)	0.044*	reference	1658 (68.3%)	312 (53.1%)	0.000*	reference
	High	985 (34.4%)	95 (61.7%)		1.071* (0.731-1.570)	628 (31.9%)	416 (39.7%)		1.156 (0.941-1.421)	999 (34.3%)	46 (43.8%)		1.529 (0.956-2.445)	768 (31.7%)	276 (46.9%)		2.142* (1.72-102.667)
WHtR	Normal	2049 (71.2%)	90 (57.7%)	0.000*	reference	1434 (72.3%)	707 (67.3%)	0.004*	reference	2086 (71.1%)	58 (54.7%)	0.000*	reference	1838 (75.3%)	300 (50.6%)	0.000*	reference
	High	828 (28.8%)	66 (42.3%)		1.494* (1.034-2.161)	550 (27.7%)	344 (32.7%)		1.228 (0.980-1.538)	847 (28.9%)	48 (45.3%)		1.772 (1.122-2.7980)	602 (24.7%)	293 (49.4%)		2.815* (2.276-3.483)

6. Dyslipidemia, Hypertension and Obesity

Cardiometabolic Risk Factors Change among Health Professionals during the COVID-19 Pandemic at A Medical Center in Southern Taiwan – A Three-year Follow-up

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Objectives: Obesity and obesity-related cardiometabolic disorders became more significant during the COVID-19 pandemic periods. The purpose of this study is to evaluate the change of cardiometabolic risks among health professionals during the COVID-19 pandemic at a medical center in Taiwan.

Methods: This is a cohort study design conducted from 2019 to 2022. The participants have participated in annual physical check-up during those three years. Cardiometablic risk factors were measured using standard methods. We also collected weight status change using BMI during this period. We used McNemar test and Wilcoxon Sign Rank test to evaluate the differences between and among subgroups. We used a logistic regression to examine the risk of increase cardiometabolic risk among different weight status change subgroups.

Results: A total of 2,217 participants, consisting of 1,641 females and 576 males, were included in this study, with a mean age of 40.2±10.2 years (ranging from 24 to 65 years). During the COVID-19 pandemic, 72 (4.4%)

participants' weight status changed from normal weight to overweight or obesity and 530 (32.3%) females remained overweight or obese during this period. Among males, the percentage was 6.8% and 61.1%, respectively (p< 0.01). Participants who remained overweight or obese have more adverse cardiometabolic risks. For example, compared with normal weight subjects, the mean SBP (131.0±18.1 mmHg) and fasting glucose (94.4 ±13.52 mg/dl) were higher in overweight subjects (p<0.01). More interestingly, among females, those who remained overweight or obese has 4.12 (%CI 3.22-5.27) times higher risk for abnormal SBP and 2.98 (2.05-4.32) times higher risk for abnormal glucose level than those with normal weight status.

Conclusions: From this study, those remained overweight or obese developed more adverse cardiometabolic risks such as high blood pressure, hyperglycemia and dyslipidemia. Prevention programs may be needed to prevent these adverse cardiometabolic risks during a pandemic and quarantine period.

6. Dyslipidemia, Hypertension and Obesity

Predicting Hypertension: Comparative Impact of General and Abdominal Obesity in Rural Punjab, India

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Background: Hypertension is a significant public health concern in India, leading to an increased risk of premature mortality. Both general and abdominal obesity are recognized as major risk factors for developing various cardiovascular diseases (CVD), including hypertension. This study aims to determine whether abdominal or general obesity better predicts hypertension among the rural population of Punjab, India.

Methods: This cross-sectional study was conducted among 2310 individuals of both sexes, aged 30-75 years, residing in Mansa, Punjab, India. Sociodemographic data were collected using a pre-tested interview schedule. Blood pressure and anthropometric measurements (weight, height, waist circumference, and hip circumference) were obtained using standardized protocols. Statistical analyses were performed using SPSS software.

Results: Correlation analysis revealed that waist circumference (WC), an indicator of abdominal obesity, had the strongest correlation with both systolic blood pressure (SBP) and diastolic blood pressure (DBP) compared to BMI, waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR). Adjusted odds ratio analysis showed that individuals with

higher WC are at a greater risk for prehypertension (OR=1.602; p=0.004) and hypertension (OR=3.018; p<0.001). However, higher BMI was also associated with increased risks for prehypertension (OR=1.717; p=0.001) and hypertension (OR=3.180; p<0.001). Underweight individuals were found to be protective against hypertension (OR=0.547; p=0.046).

Conclusion: The findings indicate that while abdominal obesity, as measured by WC, is a strong predictor of hypertension, the role of general obesity measured by BMI should not be ignored. Both types of obesity are important in assessing cardiovascular risk. Intervention programs should prioritize reducing WC and BMI through behavioral changes and lifestyle modifications, including diet and exercise, to effectively reduce the incidence of hypertension and improve public health in rural Punjab.

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Biological Potential and Therapeutic Benefit of Tricetin on Atherosclerosis with their Molecular Mechanism through Scientific Data Analysis in Medicine

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Background: Traditional medicines have been used in the history for the maintenance of health, prevention and improvement of human health. Phytochemicals are pure, active plant chemicals found to be present in the flower, leaf, seed, stem, root, vegetables, herbs, and fruits. Phytochemicals have been utilized as a source of Nutraceuticals by human beings for a long time to treat disease in medicine. A large number of useful drugs used for the treatment of human health complications in the modern age were also derived from natural source.

Methods: Numerous scientific databases has been searched and analyzed in the present investigation in order to know the health beneficial aspects of tricetin in medicine. Biological potential and therapeutic benefit of tricetin on atherosclerosis has been investigated through scientific data analysis of various scientific research works. Pharmacological activities of tricetin have been also investigated in the present investigation to know the health beneficial aspects of tricetin against atherosclerosis.

Results: Scientific data analysis of different scientific research works revealed the biological importance of tricetin in medicine. Scientific data analysis revealed the biological potential and therapeutic benefit of tricetin in atherosclerosis as tricetin suppressed oxidized low-density lipoprotein (ox-LDL)-induced expression of pro-inflammatory monocyte chemotactic protein-1 (MCP-1) and interleukin-1β (IL-1β) which signified their effectiveness against atherosclerosis in medicine. Further, other pharmacological investigation also supports the present work for their effectiveness on atherosclerosis.

Conclusion: Scientific data analysis revealed the biological potential and therapeutic benefit of tricetin in atherosclerosis.