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Meeting Abstracts

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Keynote Talks

Obesity and Non-alcoholic Fatty Liver Disease: Protective Effects of Soy Protein Diet

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Abstract

The obesity epidemic is in the United States and world for past two decades. There is a link between obesity and chronic diseases development such as diabetes, cardiovascular disease, certain types of cancers and liver including non-alcoholic fatty liver disease (NAFLD). Non-alcoholic fatty liver disease (NAFLD) is often associated with obesity. Previously, we reported consumption of soy protein diet can reduce liver steatosis. Soy protein contains isoflavones which might be responsible for this protection. Recently, we reported that soy protein with high isoflavones can reduce NAFLD using obese Zucker rat model. However, the effects of high vs. low soy isoflavones on NAFLD is less known. We examined the role of isoflavones levels in soy protein diets on protection against NAFLD in an obese rat model. 84, 6-week-old lean (n=42) and obese (n=42) rats were put on 1 of 3 dietary groups: casein diet (C=control), soy protein with low isoflavones (LIF), or soy protein with high isoflavones (HIF) for either 9 or 18 weeks. After 9 or 18 weeks, rats were sacrificed, and livers were taken for histopathological analysis. Serums were collected to measure ALT and AST. Results indicate that obese rats gained significantly more weight than lean rats for all three diet groups, with no significant difference between obese (O) LIF vs. OHIF groups. Liver steatosis scores were significantly greater in obese rats compared to lean rats at both 9 and 18 weeks. Steatosis scores between OC vs. OHIF, OC vs. OLIF, and OLIF vs. OHIF differed significantly at 9 weeks. This difference was also noted at 18 weeks with the exception of OLIF vs. OHIF. In Summary, we found that soy protein concentrate protects against liver steatosis and protection is greater with a higher concentration of isoflavones.

Obesity as a Major Risk Factor for All NCDs – Global Perspective

Arun Chockalingam

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Abstract

Globally, noncommunicable diseases (NCDs) is the main cause of death and disability. The common risk factor for all major NCDs is obesity. Obesity is the second largest risk factor (13% of adults in the world are obese, 39% of adults in the world are overweight). One-in-five children and adolescents, globally, are overweight. Obesity is determined by the balance of energy intake and expenditure. Rates have increased as the calories have become more readily available. Hunger regulation and the sense of satiety (feeling full) are two important functions in keeping one's body weight, normal. Economic burden of overweight and obesity varies between countries from USD 17 to 940 per year per person. Annual direct and indirect costs of childhood obesity, respectively, were projected to be $13.62 billion and $49.02 billion by 2050. Lifestyle, dietary, physical activity, and behavior modifications are necessary to achieve healthy weight. Progressive public health policies, self-accountability, and societal con-

science will make a difference in projecting a healthy global population. Such measures will prevent the world from catastrophic calamities due to overweight and obese population of the world.

Obesity as a New Therapeutic Target in Diabetes Therapy: How Successful Are We?

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Abstract

Obesity is a chronic disease, but also cause of many illnesses. T2D is common obesity complication. Obesity should be treated in order to prevent T2D development, but also BW reduction is commonly accepted as a target in T2D management. Approximately 30% of PwO will develop T2D, the risk is greater with higher BMI. 89% of people with T2D are living with obesity, therefore we have to treat these two chronic illnesses as a metabolic continuum. Clinical benefits are achieved with BW reduction of 5%. Early intervention in obesity treatment will have even greater results, reducing BMI by 5% is linked with more than 50% lower risk for T2D development. However, obesity remains underdiagnosed and undertreated illness. GLP-1RAs are used for obesity and T2D treatment (favorable effects on BW). Liraglutide 3.0 mg is GLP-1RA approved for obesity. SCALE Obesity & Prediabetes trial showed BW reduction of 9.2% (vs. 3.5% in placebo group), with 63.2% patients reaching 5% BW reduction. After 3 years of treatment risk for T2D was decreased by 80%. Semaglutide 1.0 mg is GLP-1RA approved for T2D treatment. When choosing therapy for T2D, medications that achieve effective glycaemic control, as well as beneficial effects on BW reduction, should be considered. Semaglutide 1.0 mg is positioned in both efficacy categories as "very high". With available GLP-1RAs it seems it is easier than ever to be successful in obesity and T2D treatment.

Turning Obesity into the Opportunity for Improving Heart Disease Outcomes

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Abstract

The prevalence of obesity is increasing globally. Obesity management is especially challenging in older people coping with multiple comorbidities. Cardiovascular disease (CVD) like angina, myocardial infarction, and heart failure further increases challenges for people attempting to change lifestyle. We have built HiLife, a positive psychology and intuitive cardiac energetics (ICE) based online healthcare platform to address these issues in cardiac patients. HiLife evaluates cardiometabolic and psychological risk, builds a resilience enhancing tailored program and a pathway towards improving health. Through virtual engagement, HiLife especially benefits cardiac patients who also have obesity. We present anecdotal cases where patients with acute cardiac conditions benefit when guided towards empowerment and active participation in their recovery. We distinguish between ketogenic diets, ketone supplements, and HiLife's intuitive ketosis. Based on proven plant based whole food diet and time restricted eating, ICE offers a tailored and supervised lifestyle program. Delivering optimal solutions for complex cardiac patients requires HiLife to build digital machine learning precision medicine algorithms. We explore collaborations to build sustainable healthcare solutions using AI technology and clinician expertise.

Behavioral Treatment of Obesity: Replacing False Hope with Health Promotion

David M. Garner

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Abstract

This presentation questions the appropriateness of behavioral and dietary treatments of obesity in the light of overwhelming evidence that they are ineffective in producing lasting weight loss. The stigmatization of obesity, the overstatement of health risks, and the pervasive influence of the lucrative diet industry have maintained public demand for dietary treatment. However,

decades of research on the biology of weight regulation make clear the unlikelihood of success with dietary treatment, information which the health professions have been slow to integrate. Recommendations were made for improving lifestyle, health risk factors, body image and the self-esteem of the obese without requiring weight loss.

Session: Childhood and Adolescent Obesity

Featured Presentations

Should Childhood Obesity be Considered a Child Protection Issue?

Peter Nelson* and Catherine Homer

Sheffield Hallam University, United Kingdom

Abstract

Whether childhood obesity should be considered a child protection issue given its substantial impact on morbidity and mortality, child development and links to child sexual abuse has divided commentators, with many questioning whether a child should be removed from parents who do not seek to reduce their child's weight, where significant obesity is identified. This divide is reflected in the social work profession where there is resistance to a role focused on bodily surveillance, whilst also acknowledging the need to investigate neglect where evidence exists of a clear parental failure to manage a child's diet, health, and fitness. Similar divisions exist in the medical profession and debates are taking place in the UK, Australia, and the US but with little research to inform policy and practice. The research discussed in this paper was undertaken by a multi-disciplinary team and sought to identify existing practice, through interviews (N23) and focus groups (N3:23) with key stakeholders from social care, health, and education in one area in the UK, exploring their decision making, views and experiences of working with obesity and the child protection system. Key findings regarding personal and professional standpoint, and the complex, nuanced and value laden impact of individual and agency thresholds on practice are considered in respect of service provision. The research demonstrates how the tensions surrounding a child protection paradigm play out in the specific area of childhood obesity, and how they impact on individual and agency practice, potentially inhibiting the services and support offered to service users.

Self-assessment and Self-perception of One's Body Mass in 18-year-old Girls

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Abstract

A survey was conducted in 1047 female 18-year-old students focusing on self-assessment and self-perception of their body mass and individual body parts, as well as their eating habits. The study subjects had their BMI and BMI-SDS evaluated, for dividing them into groups: of normal weight, obese, and underweight. Results: The number of girls satisfied and dissatisfied with their body weight was similar. Most girls with normal body weight were happy with their body weight. There were twice as many girls dissatisfied with their body weight in the underweight group and ten times as many in the group of obese girls. Most subjects, including 81% of girls with normal body weight, would like to weigh a bit less, and 65% of obese girls would like to weigh much less. 8% of girls with a normal body weight perceived their body as overweight. 70% of subjects with a normal body weight and ca. 25% of obese girls thought they were obese in the area of their abdomen, hips, buttocks, and thighs. The fear of putting on weight was characteristic most often for girls with normal body weight (70.9%). Conclusions: 1. Most 18-year-old girls do not have any disorders in terms of self-perception of their body weight. 8% of girls with a normal body weight see themselves as overweight, 18% do not see this problem. 2. The tendency to exaggerate the shapes of individual body parts is usually present in girls with a normal body weight 3. Only ¼ of obese individuals perceive obesity of individual parts of their bodies.

Young Researchers Presentation

The Impact of Adipose Tissue Content on the Range of Motion of the Upper Limb Among Children Aged 7-11 Years

Patrycja Paszek-Jemilianowicz

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Abstract

Introduction: The problem of excessive adipose tissue among children and adolescents is becoming more common every year. Overweight and obesity significantly burden the skeletal and muscular system. Early detection of disorders can contribute to their easier elimination.

Aim of the study: The aim of the research was to analyze the impact of adipose tissue content on the range of motion of the upper limb among children aged 6-10 years.

Material and methods: The research were conducted from May 2022 to September 2022. The research group consisted of 211 children aged 6-10 years, including 130 girls and 81 boys. During the research, the non-invasive bioimpedance method was used to analyze the body mass composition. The range of motion while flexion and abduction movements of the upper limb in the shoulder joint was measured using a GYKO device.

Results: Out of 211 examined children, 157 participants had excessive adipose tissue. Statistically significant differences in the mobility of the shoulder joint (flexion and abduction) were noted between children with excess body fat and the other group with normal adipose tissue ($p < 0.05$).

Conclusions: It was showed, that children whose body fat norm was exceeded had a smaller range of motion of the upper limb, compared with children with normal body fat.

Session: New Directions in Obesity Managements and Treatments

Featured Presentations

Targeted Intervention with DHA to Reduce the Risk of Cardiovascular Disease and Infection

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University of Manitoba, Canada, and St. Boniface Hospital Research Centre, Canada

Abstract

Persons who are obese are at greater risk for death due to cardiovascular disease than those who are lean. Interestingly, obesity is also associated with a greater risk of infections that primarily affect the respiratory system and sites of surgical intervention. While it has been suggested that fish oil, due to the presence of the long-chain omega-3 fatty acid docosahexaenoic acid (DHA), provides a number of health benefits related to cardiovascular disease, cancer and diabetes, the results of large-scale intervention trials have been inconsistent, which has made it difficult to conclude taking fish oil supplements will lead to improvements in these conditions. On the other hand, research conducted in our labs has led us to consider a more limited concept, where omega-3 oils are beneficial for a small range of diseases rather than being used to alleviate a vast array of ailments. To this end, both genetic and biochemical experiments indicate fish oil may be advantageous for the treatment of ischemic cardiovascular disease, particularly conditions linked to vascular dysfunction, as well as promoting immune function that in turn aids with fighting infection. In fact, we have developed a novel paradigm wherein fish oil supplements may help women entering menopause to preserve the cardioprotection they possess between puberty and menopause. For this reason, fish oil/DHA may be of particular benefit to persons who are obese and therefore at significantly greater risk of morbidity and mortality stemming from cardiovascular disease and infection.

A Collaborative Care Management Approach Results in Improved Weight Status and Chronic Disease Outcomes in an Employee Population

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Yale New Haven Health, CT, USA

Abstract

Yale New Haven Health's livingwell CARES chronic disease management and prevention program is an initiative to improve employee/dependent wellbeing. We take a collaborative, team-based approach that includes nursing care coordination, health coaching, dietetics/nutrition counseling, pharmacy and behavioral health support. Currently 75% of program participants have a chronic condition related to or impacted by weight status, including diabetes, hypertension, hyperlipidemia, other cardiovascular disease, or asthma/COPD. Greater than 80% of these same participants have a BMI in the overweight or obesity categories. The livingwell CARES program provides one-to-one support, either in-person or via telehealth, and group education programming to assist participants in making sustainable behavior change to reduce weight and other risk factors and optimize overall health. Data on our current participant population demonstrated a significant improvement in A1C control (diabetes) and average blood pressure (hypertension) after engagement. Specifically, the percentage of participants with an A1C "in control" (defined as <9%) increased from 68% pre-enrollment to 85% post-enrollment. Participants with blood pressure "in control" (<140/90) increased from 52% to 63%, respectively. We are also seeing positive trends in weight loss: 16% of participants with starting BMI of Obesity have reduced BMI to Overweight, and 22% with starting BMI of Obesity Class 2 have reduced BMI to Obesity.

Chemerin Regulates Formation and Function of Brown Adipose Tissue

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Abstract

Chemerin is involved in inflammation and immunity as well as white adipocyte biology. To further analyze the role of chemerin in adipocyte metabolism, we examined the function of chemerin in brown adipose tissue. Chemerin expression was attenuated with siRNA during the brown and white adipocyte precursor cell differentiation. Chemerin-deficient (Chem-/-) mice were compared to wild-type mice when fed a high-fat diet. Chemerin is expressed during brown adipocyte differentiation and knock down of chemerin mRNA results in decreased brown adipocyte differentiation with reduced fatty acid uptake in brown adipocytes. Chem-/- mice are leaner than wild-type mice but gain more weight when challenged with high-fat diet feeding, resulting in a larger increase in fat deposition. Chem-/- mice develop insulin resistance when on a high-fat diet or due to age. Brown adipose depots in Chem-/- mice weigh more than in wild-type mice, but with decreased mitochondrial content and function. Compared to wild-type mice, male Chem-/- mice have decreased oxygen consumption, CO_2 production, energy expenditure, and a lower respiratory exchange ratio. Additionally, body temperature of Chem-/- mice is lower than that of wild-type mice. These results revealed that chemerin is expressed during brown adipocyte differentiation and has a pivotal role in energy metabolism through brown adipose tissue thermogenesis.

Metabolic Dysfunction and Obesity-related Cancers: Time to Look Beyond BMI?

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Abstract

Introduction: Body mass index (BMI) may misclassify obesity-related cancer (ORC) risk since metabolic dysfunction can exist across the BMI distribution. We measured the association of metabolic dysfunction with the risk of ORC, adjusted for BMI.

Methods: Postmenopausal women (n=20,593) in the Women's Health Initiative with available baseline metabolic dysfunction biomarkers (blood pressure, fasting triglycerides, High-density lipoprotein (HDL)-cholesterol, fasting glucose, HOMA-IR (Homeostatic Model Assessment for Insulin Resistance) and hs-CRP (high sensitive C-reactive protein)) were included (60% white, 34% black A modifiedBlack). Cox proportional hazards regression, with death as a competing risk, was used to assess the association between metabolic obesity phenotype defined by Wildman criteria, National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP III), HOMA-IR and hs-CRP (metabolically healthy normal weight (MHNW), metabolically unhealthy normal weight (MUNW), metabolically healthy overweight/obese (MHO), metabolically unhealthy overweight/obese (MUO)) and ORC risk.

Results: After a median±IQR follow-up of 21±7 years, 2367 women developed an ORC. The risk of any ORC was elevated among MUNW (HR 1.12, 95% CI: 0.90-1.39), MHO (HR 1.15, 95% CI: 1.00-1.32), and MUO (HR 1.35, 95% CI: 1.18-1.54) as compared to MHNW. Results were similar using ATP III criteria, hs-CRP, or HOMA-IR to define metabolic obesity phenotypes.

Conclusions: Individuals with overweight or obesity with or without metabolic dysfunction, are at higher risk of obesity-related cancers compared to metabolically health normal weight individuals. However, the magnitude of risk was greater among normal weight individuals with metabolic dysfunction.

Inhibition of PPARγ by BZ26, a GW9662 Derivate, Attenuated Obesity-related Breast Cancer Progression by Inhibiting the Reprogramming of Mature Adipocytes into to Cancer Associate Adipocyte-like Cells

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Abstract

Obesity has been associated with the development of 13 different types of cancers, including breast cancer. Evidence has indicated that cancer-associated adipocytes (CAAs) promote the proliferation, invasion, and metastasis of cancer. However, the mechanisms that link CAAs to the progression of obesity-related cancer are still unknown. Here, we found a derivate of the

potent PPARg antagonist GW9662, BZ26 bound and inhibited PPARg by acting as a new modulator. We employed BZ26 to elucidate these mechanisms in high fat diet (HFD)-fed mice and E0771 breast cancer cells. *In vivo*, BZ26 mediated the browning of visceral fat and attenuated inflammation of adipose tissue and metabolic disorders. Interestingly, BZ26 inhibited the reprogramming of mature adipocytes in the epididymis fat of HFD-fed mice into CAA-like cells and inhibited the proliferation and invasion of obesity-related breast cancer. Therefore, BZ26 serves as a novel modulator of PPARg activity that is capable of inhibiting obesity-related breast cancer progression by inhibiting of CAA-like cell formation, suggesting that inhibiting the reprogramming of mature adipocytes into CAAs or CAA-like cells may be a potential therapeutic strategy for obesity-related cancer treatment.

Young Researchers Presentations

Spleen and Vagus Nerve: Influences in Glucose Homeostasis During Hypothalamic Obesity

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Abstract

Inflammation and autonomic imbalance are present in obesity. Here, we evaluated whether the spleen and vagus nerve (VN) modulate endocrine pancreas. Neonatal hypothalamic lesions were induced by monosodium glutamate (4g /Kg), resulting in obese adult rats. At 60 days these animals were submitted to surgeries: Sham (NoSplNoVag), Splenectomy (Spl), vagotomy (Vag) or associated splenectomy-vagotomy (Spl-Vag). Intraperitoneal Glucose Tolerance Test (IpGTT; 2 g/Kg) was performed at 148 days and after 48 hours, these animals were euthanized, and blood collected. Plasma was used to measure glucose, insulin, and triglycerides levels. Insulin resistance was assessed by HOMA-IR. Pancreatic islets were isolated and glucose-induced insulin secretion analyzed (5.6/11.1 mM). The area, number, and collagen deposition of the islets were evaluated. Spl and Vag surgeries reduced adiposity. Fasting glycemia was lower in Spl rats compared to Spl-Vag. Vag reduced triglycerides, regardless of the presence of the spleen. HOMA-IR in Vag animals was reduced in relation to Spl. During ipGTT, Spl animals have a lower glycemic peak compared to Spl-Vag animals. Furthermore, islets from Spl and Spl-Vag groups showed lower levels of glucose-induced insulin secretion compared to Sham (NoSplNoVag) animals. The Spl-Vag association, resulted in marked reduction of collagen inside the islets. The data suggest an important role for the spleen in glycemic control in obesity, exerting a protective effect on the endocrine pancreas, where its absence in an obese situation interferes with the regulation of glucose homeostasis. Thus, it appears that bidirectional VN and spleen interactions may exert regulatory effects on endocrine pancreas of hypothalamic obese rats.

Impact of School Physical Activity Environment on Comorbid Obesity and Myopia in Children and Adolescents: Findings From a Chinese National Cohort Study

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Abstract

Background: Overweight and obesity (OWOB) and myopia have become two of the most important issues affecting the health of children and adolescents worldwide. However, there has been no research exploring OWOB and myopia as a comorbidity.

Methods: A total of 9814 children and adolescents aged 6-18 years were included from the Chinese National Survey on

Students' Constitution and Health follow-up survey conducted from November 2019 to November 2020 in China. Anthropometric measurements, unaided distance vision acuity and non-cycloplegic refraction data were collected to assess OWOB and myopia, while questionnaires for children and adolescents aged 9-18 years were investigated to assess school environment for physical activity (PA). We calculated the one-year incidence and progression rates of comorbid OWOB/myopia, OWOB alone, and myopia alone. Mixed effect logistic regression evaluated the association between school environment for PA and incidence and progression of comorbid OWOB/myopia, OWOB, and myopia.

Results: The prevalence of comorbid OWOB/myopia increased from 11.1% in 2019 to 17.9% in 2020, and the incidence of comorbid OWOB/myopia was 10.9%. Children and adolescents experiencing an unfavorable school environment for PA had a higher risk of the incidence of comorbid OWOB/myopia compared to a favorable school environment (RR = 1.85, 95% CI: 1.42–2.42). Similar findings were seen in the incidence of obesity (RR = 1.86, 95% CI: 1.26–2.75). Children and adolescents in an unfavorable school environment for PA had a higher annual risk of myopia progression (RR = 1.29, 95% CI: 1.01–1.65).

Conclusions: Obesity and myopia and their comorbidity have been serious among children and adolescents in China. A favorable school environment for PA might mitigate the risk of comorbid OWOB/myopia, OWOB, and myopia progression. PA-friendly school environments with multi-sectoral collaboration between schools, families, communities, and health care providers should be encouraged.

Novel Weight Loss Diet Attenuates Dietary-induced Obesity

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Abstract

Many dietary patterns have been studied for weight loss, yet various limitations remain. We designed a novel weight loss diet (NWLD) with a carbohydrate, protein, and fat (energy) content of 45%, 20%, and 35%, respectively. Saturated fatty acids: monounsaturated fatty acids: polyunsaturated fatty acids ratio was 1:2:1, and insoluble: soluble dietary fiber ratio was 2:1. We aimed to observe the effect of NWLD on weight loss and understand the underlying metabolic mechanisms. Twenty-nine male C57BL/6J mice were selected. Nine mice were fed ordinary feed in a blank control group, and the rest were fed a high-fat diet (HFD) to establish obese mouse models. Twelve weeks later, obesity models were established, and 10 obese mice were switched to NWLD feeding for 6 weeks. Then we collected serum, intestinal feces and kidneys from the mice, measured obesity-related indicators, gut microbial composition, and fecal metabolite profiles, and analyzed correlations between these indicators. Kidney function indicators were also assessed. The results showed that the NWLD attenuated HFD-induced weight gain, serum triglycerides, and inflammatory factors, optimized body composition and did not impair renal function. Amino acid metabolism pathways and metabolites might play a key role in this process. The dietary formula has a good intervention effect on simple obesity and takes into account the anti-inflammatory properties of the diet and the protective effect on kidney function. The nutrients ratios are not extreme, which is conducive to the promotion of compliance, so it has a good value and prospect for industrial transformation.

The Effect of a Multifaceted Intervention on Dietary Quality in School Children and the Mediating Effect of Dietary Quality Between Intervention and Changes in Adiposity Indicators

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Abstract

Objectives: The study aimed to assess the effect of a multifaceted intervention for childhood obesity on dietary quality and examine the mediating role of dietary quality in the intervention effects.

Design: Cluster randomized controlled trial. Randomization was performed by an independent person who was blinded to schools using a computer-generated random number system.

Setting: 24 schools across three socioeconomically distinct areas in China.

Participants: 1176 children participated in a baseline (2018) and end-of-trial (2019) examination, including 605 in the intervention group and 571 in the controls.

Intervention: The intervention included five components (three targeted children and two targeted their environment).

Outcome measures: Self-reported behavior and anthropometric measures were collected at both time points. The Diet Balance Index Revision (DBI-07) was calculated to assess dietary quality.

Results: Generalized linear mixed models were used to estimate the intervention effect on dietary quality and its mediating effects. Compared to the controls, the proportion of sugar-sweetened beverage (SSB) intake (OR = 0.27, corrected $p < 0.001$) decreased in the intervention group. Higher bound scores (HBS) of DBI-07 indicating over-intake decreased in the intervention group compared to the controls (mean difference = −1.52, corrected $p = 0.015$). Changes in the HBS partially mediated the associations between the intervention and changes in body mass index, waist circumference, and body fat percentage.

Conclusions: The intervention effectively improved children's dietary quality, which in turn led to beneficial changes in adiposity indicators. Future intervention should promote knowledge, attitudes, and behaviors related to dietary quality.

Trial registration: Clinical Trials NCT03665857.

The Effects of High Body Mass Index on Disease Burden Across China and Its Provinces, 2005-2018: A Population-based Study

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Abstract

Background: Temporal trends and geographical variations in disease burden attributable to high body mass index (BMI) in China have not been fully elucidated.

Methods: We used a temporal-spatial Bayesian hierarchical model to estimate age-, year-, sex- and province-specific BMI levels based on pooled data of 1.25 million adults aged 20 years and older. Comparative risk assessment method was used to estimate deaths, YLLs and life expectancy lost for eighteen diseases attributable to high BMI.

Results: The average age-standardised BMI was 24.6 kg/m^2 (95% uncertainty interval [UI], 22.8 to 26.3) for males and 24.1 kg/m^2 (95% UI, 22.5 to 25.8) for females in 2018. We estimated that 0.59 million (95% UI, 0.56 to 0.62) deaths were attributable to high BMI in China in 2018, with an obvious increased from 2005. The age-standardised YLL rate attributable to high BMI was 1198.75 (95% UL, 1154.72 to 1239.68) per 100, 000 and was higher in males than in females. We estimated that life expectancy lost caused by high BMI is 0.57 years. At the provincial level, although the age-standardised mortality rate attributable to high BMI increased among most provinces in China, that in Tianjin, Beijing and Inner Mongolia showed a decreased trend.

Conclusion: The disease burden attributable to high BMI increased substantially between 2005 and 2018, with considerable gender- and age-related variation among the 31 provinces in China. Effective and locally adapted preventive policies and clinical intervention should be implemented to lower the weight and improve health in population.

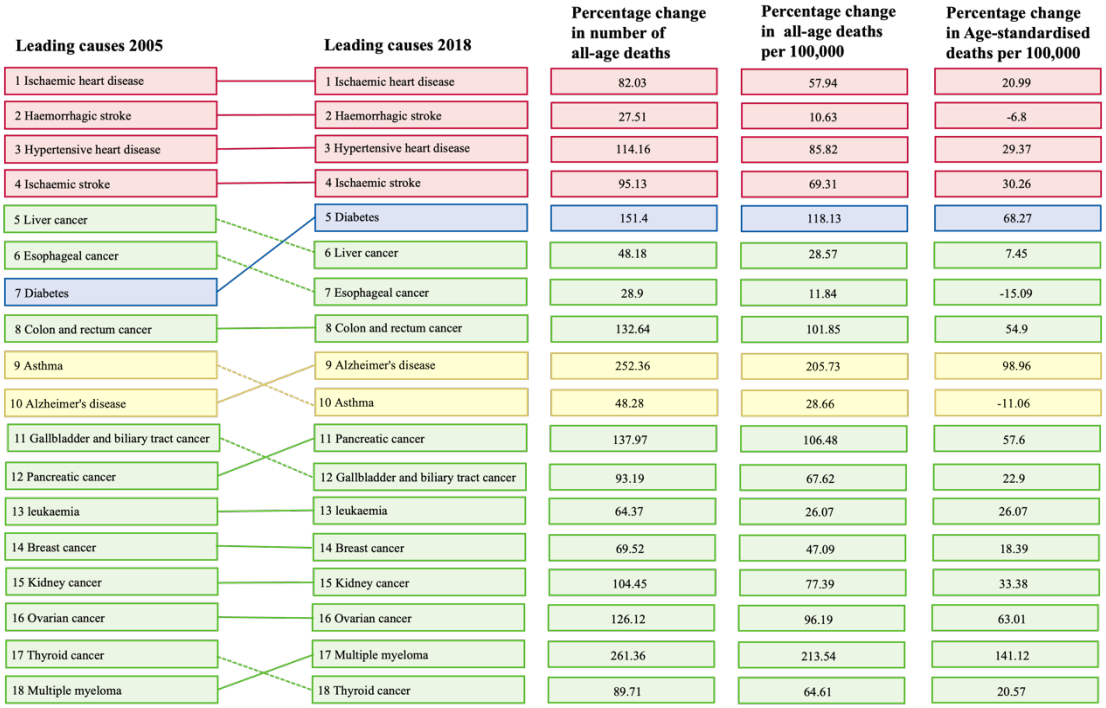

Figure: Causes of death attributable to high BMI in China, 2005-2018. Causes are ranked by age-standardised mortality rates.

The Relationship Between the Number of Pregnancies and Obesity

Jie Lin*, Qian Ren, Fanjie Zhang, Jing Gui, Xin Xiang and Qin Wan

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Abstract

Purpose: Our study aimed to elucidate the mechanism underlying the regulatory role of β-hydroxybutyrate dehydrogenase 1 (Bdh1) in macrophage oxidative stress during diabetes-accelerated atherosclerosis (AS).

Methods: Through immunohistochemical analysis of femoral artery sections from diabetic AS patients, AS patients and healthy subjects, we investigated the differential expression of Bdh1. Additionally, we employed diabetic Apoe-/- mice and high glucose (HG)-treated macrophages to replicate the diabetic AS model. We then utilized adeno-associated virus (AAV) to overexpress Bdh1, as well as overexpression and silencing of the Bdh1 gene to determine the role of Bdh1 in this disease model.

Results: We observed downregulated expression of Bdh1 in diabetic AS patients, HG-treated macrophages, and diabetic Apoe-/- mice. AAV-mediated overexpression of Bdh1 attenuated aortic plaque formation in diabetic Apoe-/- mice, while silencing of the Bdh1 gene led to increased reactive oxygen species (ROS) production and inflammatory response in macrophages. However, this effect was reversed with the ROS scavenger N-acetylcysteine (NAC). Overexpression of the Bdh1 gene protected Raw264.7 cells from HG-induced cytotoxicity by inhibiting the overproduction of ROS. Furthermore, Bdh1 activated the Nrf2 pathway in Raw264.7 cells by regulating the metabolic flux of fumarate, thereby inhibiting oxidative stress and reducing ROS production and inflammatory factor expression.

Conclusions: 1) Bdh1 attenuates atherosclerosis in type 2 diabetic Apoe-/- mice; 2) Bdh1 promotes ketone body metabolism, leading to accelerated lipid degradation and decreased lipids; 3) Bdh1 activates the Nrf2 pathway in macrophage cells through regulation of fumarate metabolism, resulting in a decrease in oxidative stress and inflammatory factor production.

Keynote Talk

Multi Organ Metabolic Improvements After Bariatric Surgery

Rama Rao Ganga

University of Missouri, MO, USA

Abstract

Review of the multi organ functional and metabolic improvements after weight loss surgery.

Session: Eating Disorders, Lifestyle and Other Factors

Featured Presentations

The Nutritional Status of Saudi Girls with and without Disordered Eating Behaviors

Ahlam Badreldin El Shikieri

Taibah University, Saudi Arabia

Abstract

Background: Eating disorders (EDs) are the most common psychiatric problems among adolescents.

Objective: To compare the nutritional status of adolescent girls with and without disordered eating behaviors in Saudi Arabia. It is hypothesized that many girls with disordered eating behaviors have impaired nutritional status.

Methods: An epidemiological, cross-sectional study included adolescent girls (10-18 years) with and without eating disordered behaviors in Al Madinah Al Munawarah, Saudi Arabia. Weight and height were measured twice, and Height-for-age and BMI-for-age were classified based on the WHO's growth charts. Girls' parents gave consent for participation in the study. Descriptive statistics, Independent Student t- test, and one-way ANOVA were determined using SPSS version 26.

Results: A total of 381 girls fulfilled the study criteria, with 10% suffering from stunted and severely stunted growth. The eating-disordered adolescents were either overweight (7.7%), obese (10.3%), stunted (7.7%), or severely stunted (2.6%). On the contrary, girls without EDs were either wasted or severely wasted (7%). One-way ANOVA revealed that the BMI-for-age was influenced by age (p = 0.028), the type of ED (p = 0.019), and the EAT-26 (p = 0.0001).

Logistic Binary Regression revealed that girls who were either at possible risk for being overweight (Odd ratio = 1.34, 95% CI: 0.157-0.723, p = 0.005) or were obese (Odd ratio = 1.38, 95% CI: 0.023-0.382, p = 0.001) had higher probabilities for developing EDs as defined by their EAT-26 scores.

Conclusion and implication for dietetic practice: Among adolescent Saudi girls, being overweight and obese are associated with EDs. Nutrition professionals must target adolescents, teachers, and parents and provide nutritional education about the early signs and symptoms of EDs and the benefits of following a healthy dietary pattern.

Fat and Pain Reduction in Lipolymphedema and Lipedema Using a Non-invasive Treatment of Compressive Microvibration

Pier Antonio Bacci[1*], Diffidenti Bianca[2], Cavalletti Gianluca[3] and Rosa Grazia Bellomo[4]

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[4]*University of Study of Urbino "Carlo Bo", Department of Biomolecular Sciences, Urbino, Italy*

Abstract

Lipolymphedema and lipedema are pathologies characterized by microvascular alterations associated with variations in the quantity/quality of subcutaneous adipose tissue with deep fasciomuscular pain and a tendency to adipose dystrophy and overweight. De Godoy's studies have demonstrated the correlation with excess visceral adipose tissue and possible dysfunctions in the hepatic/intestinal axis, with progressive widespread edema and subcutaneous adipose hypertrophy, especially in the abdomen and lower limbs of women. Thirty patients were treated with twelve sessions of a non-invasive compressive microvibration treatment Endosphères Therapy, using a patented instrument that produces mechanical vibrations at particular frequencies, thanks to soft silicone microspheres that rotate at different speeds and pressures. The results highlighted the reduction of pain and subcutaneous adipose tissue in the thigh and abdomen, not only due to the vascularizing activity of the method, but also due to the direct metabolic action on the adipose and stem membranes which release signal vesicles, indicating the method non-invasive also as an important tool for the prevention of overweight and lipedema.

The Evolved Microbiome and the Infant Origin of Adult Disease

David Smith

NoRCEL, United Kingdom

Abstract

In 1990, the epidemiologist David Barker, late of Southampton University, UK, published what became known as his "Fetal Origins Hypothesis". Just a year earlier, David Strachan published his own article on what became known as the "Hygiene Hypothesis". Sadly, the only thing that these two articles had in common was an unknown mechanism. By 2017, an article by Dinan and Cryan entitled "The gut-brain axis in obesity" managed to crystallize my thoughts. Of course, each evolutionary step happened in the presence of its precursors. Thus, as Margulis has pointed out, unicellular eukaryotes arose in the midst of a prokaryote community and would have dominated it. Likewise, the multicellular, higher, eukaryotes arose in the presence of a mixed microbial community but, perhaps, the microeukaryote-led community was the center of the first creatures. Imagine that the resultant arms race led to a proliferation of defensive armor and offensive weaponry allied to sophisticated sense organs, with a headquarters and communication system to link them. The basis of our argument is that this came about by the end of the Ediacaran, setting the scene for the development of the Vertebrata and the following Cambrian "explosion". Since 2022, our team has been collecting relevant references to fill out this argument: that the microbiome is a component of the evolved immune system, communicating with the body through the neural/chemical gut-brain axis to partition nutrition and maintain mental health. The mechanism is control of peristalsis, and its failure leads to obesity. How to fix these diseases?

Session: Comorbidities Associated with Obesity

Featured Presentations

Severe Obesity in Patients with ST-elevation Myocardial Infarctions: Temporal Trends and Impact on Short- and Long-term-prognosis

Johannes Schmucker

Bremen Institute for Heart and Circulation Research, Germany

Abstract

Background: The prevalence of obesity and severe obesity has increased in the general population of the western industrialized nations during the last decades with growing implications on health systems. Aim of the present study was to analyse prevalence rates of severe obesity (body mass index (BMI)≥40 kg/m^2) in patients with ST-elevation myocardial infarctions (STEMI) between 2006 and 2022 and its association to age, other cardiovascular risk factors and in-hospital- and long-term-outcome rates.

Methods: All patients admitted with STEMI between 2006 and March 2022 to a large German PCI center entered analysis. Patients were assigned to the study group with severe obesity (BMI≥40 kg/m^2), a control group (obesity grade 2 (BMI 35-39.9 kg/m^2)) and a second control group (BMI≤35 kg/m^2).

Results: From a total of 11740 patient included, 269 patients (2.3%) presented with severe obesity with a mean weight of 128.9±18 kg, while 589 patients (5.0%) had obesity grade 2. Patients with severe obesity were on average 6.4 years younger compared to patients with a BMI≤35 kg/m^2: 57.7±11.5 vs. 64.1±13.1, p<0.01). Rates of severe obesity were higher in women in most age strata, especially in the young: women 9.3%, men 3.0%, p<0.01. Over time the proportion of severe obesity increased from 1.9% in 2006-2013 to 2.9% in 2014-2022, p<0.01. This increase was again more pronounced in women 2.5% to 3.9% (p=0.02) vs. men: 1.7% to 2.5% (p<0.01) and most prominent in young STEMI-patients: 2.3% to 6.2%, p<0.01. The increasing prevalence of severe obesity over time could be confirmed in multivariate model, however only for the young (Table). While there was no association between severe obesity and hyperlipidemia (LDL-cholesterol 120.9±44 mg/dl in severe obesity vs. 121.5±57 mg/dl in controls, p=0.91), it was associated with higher rates of diabetes mellitus (45.5% vs. 18.8%, p<0.01). Patients with severe obesity showed similar rates of multivessel disease (61.6% vs. 63.5%, p=0.51) and successful primary percutaneous coronary intervention (TIMI 2/3 post PCI: 96.2% vs. 95.1%, p=0.44). In an adjusted analysis severe obesity was associated with similar in-hospital-mortality-rates (OR 0.98, 95% CI 0.6-1.6, p=0.94), however in long term follow up a trend for a higher 1-year-mortality (OR 1.49, 95% CI 0.98-2.2, p=0.065) and a significantly higher 5-year-mortality (OR 1.82, 95% CI 1.17-1.82, p<0.01) could be observed.

Table: Comparison of prevalence rates of severe obesity in STEMI-Patients 2014-2022 compared to 2006-2013

		OR	95% CI	p
<55 yrs. of age	Men	2.27	1.2-4.4	0.016
	Women	3.42	1.3-9.2	<0.01
≥55 yrs. of age	Men	1.28	0.7-2.3	0.5
	Women	1.31	0.6-2.9	0.5

Conclusions: These results from a large registry study reveal, that during the last 16 years rates of severe obesity in patients with ST-elevation-myocardial infarctions increased by more than 50%. The increase was most prominent in women and the young, where rates more than doubled. At the same time, severe obesity was associated with a young age during the index event and a worse long-term-outcome. If rates of severe obesity in the general population continue to increase, then more acute myocardial infarctions especially in the young and in women are to be expected in the near future.

Apelin-13 Concentration in Patients With Essential Hypertension, Extrasystole and Obesity

Nataliia V. Kuzminova[1*], Anastasiya V. Ivankova[1], Valentyna O. Romanova[1], Volodymyr V. Kalitai[2], Olena M. Kulchytska[1] and Iryna I. Knyazkova[3]

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[2]*Vinnytsia National Technical University, Vinnytsia, Ukraine*
[3]*Kharkiv National Medical University, Ukraine*

Abstract

Introduction: Today metabolic markers of cardiovascular risk are being actively studied. One of them is apelin-13.

Objective: To assess the concentration of apelin-13 in patients with hypertension and extrasystole depending on obesity.

Materials and Methods: 156 patients with stage II essential hypertension were examined. 124 of them had frequent extrasystoles (main group), 32 patients had no arrhythmias (comparison group). All patients underwent a clinical, instrumental examination and the assessment of apelin-13 concentration.

Results: In the main group of patients, the mean value of body mass index (BMI) was 31.40 ± 0.43 kg/m^2 compared with BMI in the comparison group 30.21 ± 0.93 kg/m^2 (p = 0.046). In the group of patients without extrasystoles normal weight occurs significantly more than in the main group (25.0% vs. 6.5%, p = 0.002). The higher rate of the abdominal obesity (60.5% vs. 37.5%, p = 0.02) was observed in main group. The average content of apelin-13 was significantly (p = 0.02) lower in patients with extrasystole than in those without arrhythmia. In patients with hypertension and obesity, the concentration of apelin-13 did not show a significant difference relative to the concentration of apelin-13 in patients with hypertension without obesity (p = 0.65).

Conclusion: Obesity is most common in patients with hypertension and arrhythmias, compared to patients without arrhythmias. In patients with hypertension, extrasystole and obesity, the average content of apelin-13 did not show a significant difference relative to the concentration of apelin-13 in patients without obesity which needs further study.

Expression of p27Kip1 in Obesity, Type 2 Diabetes and Caloric Restriction

Isao Eto

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Abstract

Introduction: It is well established now that (1) the risks of various types of cancer are significantly higher in obesity and/or type 2 diabetes. It is also well established now that (2) the risks of various types of cancer are significantly lower in caloric restriction. The underlying molecular biological processes, however, appear to be very confusing. We now propose that the p27Kip1, a specific cell cycle repressor protein, appears to provide a consistent molecular biological mechanism of the risks of various types of cancer in obesity, type 2 diabetes, or caloric restriction.

Expression of p27Kip1 in small cases

p27Kip1 is a cell cycle repressor protein expressed primarily in the late G1 phase of the cell cycle. Subsequent *in vivo* physiological studies and *in vitro* biochemical studies indicated that the expression of p27Kip1 is significantly decreased in obesity and/or type 2 diabetes. This suggested that the flood gate between G1 and S phase is open, the cell cycle goes faster, DNA replication increases in S phase and cell division increases in M phase. In contrast to obesity and/or type 2 diabetes, expression of p27Kip1 is significantly increased in caloricrestriction. This suggested that the flood gate between G1 and S phase is closed, the cell cycle goes slower, DNA replication decreases in S phase and cell division decreases in M phase. Please note that these types of change in the expression of p27Kin1 were never observed with any other cell cycle regulatory proteins.

Molecular biological mechanism of the expression of p27Kip1 mRNA

Examinations of the primary RNA sequence of the p27Kip1 mRNA revealed the existence of a very unusual RNA sequence. This sequence spans from 5'-upstream negative position of 575 to negative position of 1. This sequence regulates the level of expression of p27Kip1 protein.

Young Researchers Presentation

Feasibility of Concomitant Transoral Incisionless Fundoplication (cTIF) Procedure for Morbidly Obese Patients (BMI ≥ 35 kg/m^2)

Catherine Tran[1*] and Phoenix Nguyen[2]

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[2]Hoag Physician Partners, St. Jude Medical Center, Mission Hospital Regional Medical Center, CA, USA

Abstract

Introduction: Gastroesophageal reflux disease (GERD) is a chronic disorder strongly associated with excess body weight. Concomitant transoral incisionless fundoplication (cTIF) combines hiatal hernia (HH) repair followed by EGD and TIF procedures. For patients obese or greater on the body mass index (BMI) scale, providers are more averse to performing cTIF due to lower likelihood of efficacy and positive outcomes.

Methods: This study includes 8 Morbidly Obese (BMI ≥ 35) patients out of 133 patients (average = 59.74 years) with GERD and HH who underwent cTIF procedure from January 2019-July 2022 at a single hospital. 6 have HH sizes ≥ 3 cm. Assessment is based on pre-/post-operative GERD/ROARS Questionnaires, reported relevant symptoms, and recurrent HH. Morbidly Obese patients have an average BMI of 36.89 kg/m^2 and average age of 54.63 years (range: 26 – 69).

Results: For 133 patients, Pre-operative Questionnaire Scores were significantly higher than Post-operative based on Wilcoxon Signed-Rank test (GERD: $p < 0.01$, ROARS: $p < 0.01$). In shortterm follow-ups (< 6 weeks), reported relevant symptoms greatly improved or resolved for 97.74% of patients and 100% of Morbidly Obese. 87.50% of Morbidly Obese reported better overall outcomes in long-term follow-ups (≥ 6 weeks). Post-cTIF, 87.50% of Morbidly Obese reported improvements in "regurgitation" and 80% in "heartburn", and 75.00% discontinued or successfully tapered off PPI/H2B usage. 9 of 133 patients have recurrent HH, with none being Morbidly Obese.

Conclusion: The aim of this study is to report on a series of Morbidly Obese patients who underwent a cTIF procedure demonstrating feasibility with positive outcomes.

E-Poster Presentations

Leptin Level in Patients with Coronary Heart Disease Depends on Body Weight

Nataliia V. Kuzminova[1], Valentyna O. Romanova[1], Anastasiya V. Ivankova[1*], Olena V. Kalitai[2], Lidiia O. Romanova[1] and Nataliia Yu. Osovskaya[1]

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Abstract

Objective: Obesity is an independent risk factor of coronary heart disease (CHD). Adipokine leptin produced by adipose tissue can lead to atherosclerosis development and progression.

Purpose: To evaluate leptin level and its diagnostic significance in coronary heart disease patients depends on their weight.

Methods: 130 CHD patients were examined: 69 patients with stable angina II-III functional classes and 61 patients with acute coronary syndromes (ACS) (unstable (progressive) angina (UA) and acute myocardial infarction (MI)). The control group included 30 healthy subjects. Leptin level was determined by ELISA. To study the influence of body weight on leptin level, we compared three groups of patients – with normal body weight, overweight, and obesity I degree. Patients with higher weight were not included to the study. Groups were representative by other characteristics.

Results: The average leptin level in CHD patients was twice higher than in control group ($p<0.01$). It increased with an increase of disease severity. The highest leptin level was observed in patients with ACS (Δ% compared to control – 107.6% for UA and 120.3% for MI without significant differences between these groups ($p>0.05$)), and less in patients with III FC of stable CHD (Δ% – 91.2%). Leptin level was 20.6% higher ($p<0.01$) in patients with excess body weight than in those with normal one. It increased with an increase of body weight reaching the highest levels in patients with obesity ($p<0.01$). Thus, the results of the study suggest that leptin may play an important role in CHD progression. Leptinemia depends on patients' body weight.

Changes in the Expression Level of microRNAs (miR-142 and miR-378) in Obese Patients and During Sibutramine Therapy

Alina Babenko*, Georgii Matveev and Natalia Khromova

Federal State Budgetary Institution "Almazov National Medical Research Centre" of the Ministry of Health of the Russian Federation

Abstract

One promising approach in obesity treatment is to increase energy expenditure, in particular by activating brown adipose tissue (BAT). On the contrary, activation of profibrotic genes and fibrogenesis impairs adipose tissue (AT) plasticity and reduces its storage capacity. Non-coding microRNAs can serve as a tool to understand the molecular genetic aspects of both BAT activation and fibrogenesis activation/inhibition processes. The expression of these miRNAs was assessed in subcutaneous AT in 37 obese patients, of which 13 patients received sibutramine 10 mg daily for 6 months and in 10 patients of healthy control (HC), comparable in age. Compared with HC, obese patients before therapy had significantly increased miR-378 expression ($p=0.04$), and miR-142 expression was reduced ($p=0.008$). The level of both studied miRNAs differed to the greatest extent from the level in the HC at the 1st degree of obesity: miR-378 expression was significantly increased only at the 1st degree

of obesity (p=0.03), miR-142 expression is more significantly reduced in obesity grade 1 (p=0.004) than in obesity grade 2 (p=0.08). In the course of therapy with sibutramine, an increase in miR-142 expression from the initial level (p=0.01) to the level of HC (p=0.6) was revealed. miR-378 expression did not change significantly during therapy (p=0.5). The data obtained indicate the activation of adipogenesis in the early stages of the development of obesity and the activation of fibrosis through the TGF-β pathway. Sibutramine therapy did not significantly affect the expression of miR-378 involved in adipogenesis but increased the expression of antifibrogenic miR-142.

Transoral Outlet Reduction: A Single Center Experience of Tackling Weight Regain After Roux-en-Y Gastric Bypass

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Abstract

Background: Long term failure after Roux-en-Y gastric bypass (RYGB) is well-known and occurs in 10-15% of patients according to the literature. Causes are multifactorial and dilatation of the gastro-jejunal anastomosis (GJA) is only one of these. A transoral outlet reduction (TORe) with endoscopic suture to reinstall more restriction could be a valid and safe alternative to reduce regained weight after failed bypass surgery. The objective of this article is to describe our single-center experience and discuss the adverse events of the technique.

Objectives: To describe our single center case series and adverse events after TORe for weight regain after RYGB.

Methods: We report a case series of 20 patients referred due to weight regain after RYGB with a dilated GJA. TORe was performed using an endoscopic full-thickness suture device (Apollo OverStitch®) to reduce the diameter of the GJA and the volume of the gastric reservoir. Prospectively collected data on technical feasibility, safety and efficacy are described with a median follow up of 22 (6-38) months.

Results: Mean BMI was 44,5 kg/m^2 at the time of RYGB. Postoperative nadir BMI was 27,7 kg/m^2. The average time to TORe was 12.1 years after initial RYGB. Patients regained a mean 45.9% of excess body weight loss (EWL) before TORe and had a mean preprocedural BMI of 35.3 kg/m^2. The aim was to reduce the aperture of the GJA to 5 mm which was done with a mean of 1.7 sutures and 3.5 stitches. The mean absolute weight loss was 13 kg and BMI reduction was 3.9 kg/m^2 after six months. After a median follow-up of 22 months, a BMI of 31.4 kg/m^2 was observed, which is Dumping symptoms resolved in four of our patients six weeks after TORe. Procedural adverse events were nausea and vomiting, sore throat, mild transient abdominal pain, diarrhea, and constipation. All of them were treated conservatively. We describe one case of postprocedural mediastinitis treated with a laparoscopic drainage without clinical evidence for perforation.

Conclusions: Endoscopic TORe by narrowing the dilated GJA appears to be a viable and safe minimal invasive option to tackle weight regain after RYGB and should be more used in clinical practice.

Mindfulness Intervention for Obesity in College Students

Trisha Sundaram[1*], Inba Thiyagarajan[2], Som Singh[3] and Anand Chockalingam[4]

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[2]The Indian Public School, India
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[4]University of Missouri, Columbia, USA

Abstract

Increase in cortisol levels is directly related to higher levels of stress. Chronic stress and high cortisol levels lead to overeating processed foods, which leads to weight gain and obesity. More than half of young adults in the U.S. are overweight or obese. Mindfulness is an effective practice to reduce stress. Is there an integrative mindfulness approach to buffer stress and increase overall wellbeing in college students? HiLife, a mobile health self-tracking tool, will implement a 7-Day Virtual Challenge to gather college students to follow the Self Talk-Observation-Silence (SOS) lifestyle practice. Participants will log onto a live

webinar to participate. Each day of the challenge will begin with 2 minutes of self-talk observation, allowing any thought that comes to the participant's mind to be said aloud. Participants will subsequently move towards sitting in silence for 8 minutes. After this 10 minute practice, participants can resume their routine activities. Self talk is derived from sports psychology to improve intrinsic motivation and to enjoy daily life challenges. Silence is a simple yet powerful tool for self-inquiry resilience building. After the challenge, participants have the choice to continue this practice on their own, join an SOS buddy group in HiLife's online platform, or to move out of the SOS program. This program dives deeper into understanding the ways that the mind works and its stressors, helping individuals to proactively cope with stress and challenge. SOS has helped people gain self-awareness, which is central to sustaining deep lifestyle changes and weight loss.

Impact of Concomitant Hiatal Hernia (HH) Repair and Transoral Incisionless Fundoplication (cTIF) Procedure in Patients With Morbid Obesity With Gastroesophageal Reflux Disease (GERD)

Catherine Tran[1*] and Phuong Nguyen[2]

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[2]Hoag Advanced Endoscopy Center, Newport Beach, CA, USA

Abstract

Background: GERD is a common chronic disorder strongly associated with excess body weight. Surgical treatments of GERD are currently not indicated for patients with morbid obesity due to possible higher failure rates. No prior study has evaluated feasibility of cTIF for patients with morbid obesity.

Methods: We conducted a retrospective analysis of 133 consecutive patients (Mean Age: 60, Range: 22-83, 58M/75F) who underwent cTIF from Jan'19-Jul'22 at a single institution. Body Mass Index (BMI) classifications included Normal, Overweight, Obese, and Morbidly Obese (BMI≥35 kg/m^2). Follow-up evaluation included Registry of Outcomes from Anti-Reflux Surgery (ROARS)/GERD Questionnaires, relevant symptoms, proton-pump inhibitor (PPI) use, and weight.

Results: Seven patients were classified as Morbidly Obese (Mean BMI: 37 kg/m^2). All cTIF's were performed successfully. All patients had post-cTIF weight loss (Mean: 10%) and improvement/resolution of regurgitation and heartburn (Mean Follow-Up Interval: 174 days). Of 5 patients on PPI pre-cTIF, 4 decreased or discontinued PPI. 40 patients had pre- and post-ROARS/GERD questionnaires, which were analysed using Mann-Whitney U tests. There were no significant differences in reported GERD scores (z=1.034, p=0.301) and ROARS scores (z=0.325, p=0.745) between Normal-Overweight (n=28) and Obese-Morbidly Obese (n=12) patient groups.

Conclusions: We demonstrated feasibility of cTIF for patients with morbid obesity. At short-term follow-up, patients had no hiatal hernia recurrences, stopped/reduced PPI use, had improved reflux symptoms, and associated weight loss. When compared to patients with lower BMI, patients with higher BMI reported similar positive outcomes within the ROARS/GERD questionnaires. As pre-existing GERD may limit bariatric options, future studies should further evaluate the utility of cTIF prior to bariatric surgery.

Educational Trajectories and Obesity Among U.S. Adults: Evidence From the National Longitudinal Survey of Youth 1997

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Abstract

Background: Individuals with more education experience better health throughout the lifecourse than individuals with less education, including lower risk of obesity. However, the mechanism(s) by which education promotes health are largely unknown. This study assessed how educational trajectories are related to BMI at age 39 among participants in the National Longitudinal Survey of Youth 1997 (NLSY97).

Methods: We used data from the NLSY97 (1997 to 2018) to construct educational trajectories (after exclusions, N = 5,984). A sequence analysis using Dynamic Hamming and agglomerative hierarchical clustering resulted in 11 distinct trajectories. We assessed differences in BMI by trajectory type using linear regression models controlling for covariates and considered interactions between trajectories and sex, trajectories and ethnicity, and sex and ethnicity.

Results: Of the 11 identified trajectories, 3 exhibited patterns of interruptions while attending school . No trajectories had a healthy average BMI. Significant differences in BMI by trajectory type were observed. Specfically, the uninterrupted paths to GED, BA, and Graduate school trajectories had lower odds of obesity than other groups. Both sex and race/ethnicity moderated the effect of trajectory type on outcome. Differences in trajectory effect on BMI by sex were seen for uninterrupted path to HS diploma, interrupted path to GED, and uninterrupted path to GED.

Conclusions: Our results are consistent with previous work showing that in addition to highest degree attained, type and timing of degree attainment are important social determinants of health. Supporting uninterrupted educational participation may be one mechanism for supporting healthy weight and overall population health.

How to Improve Social Connectivity Among Adults Using Technology?

Trisha Sundaram[1*], Inba Thiyagarajan[2], Meghna Mallapan[3] and Anand Chockalingam[4]

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[2]The Indian Public School, India
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Abstract

Globally individuals are experiencing increased rates of loneliness and social isolation which are risk factors for increased premature mortality. There is a link between mental health conditions such as loneliness and eating disorders. People with obesity are at increased risk of developing heart disease. Over the past 10 years, HiLife has created programs to help cardiac patients worldwide through its online platform. Is there a way to improve genuine social connectivity via HiLife to overcome loneliness in adult populations? Hi Buddy is an online health platform where individuals will be matched into buddy groups based on self-identified interests and identities. Algorithms and artificial intelligence will introduce compatible users. Each buddy group will consist of 6-8 members, and buddies are encouraged to plan 3-4 healthy lifestyle activities. Discussion questions will also be provided each week. The HiLife forum will provide an accountability system and social support as members of this program adopt healthier behaviors. Individuals are empowered to utilize green spaces within their community to share experiences and use technology to gather virtually to share a common experience. A variety of activities that groups can design will engage people to make lasting changes to their habits and increase awareness of the importance of a healthy lifestyle. The discussion questions are designed to help individuals discover or rekindle their sense of purpose and fulfillment, enabling older populations to share their life experiences and meaningfully engage with community. Hi Buddy can build real community through optimizing virtual technologies.

Enhancing Obesity Management in Primary Care Through a Nurse Practitioner Guided Weight Management Program

Nkechi Onyegasi

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Abstract

Background: Obesity is the most prevalent chronic disease in the United States affecting approximately 38% and 41% of men and women, respectively. Obesity is associated with several chronic diseases including diabetes, cancer, and cardiovascular diseases. The global economic impact of obesity is estimated to be $2.0 trillion due to the increased costs of healthcare, missed wages, and disability. Although the prevalence of obesity in the United States is increasing, its treatment in primary care is declining. Implementing obesity reduction programs can result in savings of over $610 billion over a period of 20 years.

Purpose: To utilize a nurse practitioner led program to help participants achieve weight loss and a subsequently higher level of wellness.

Methods: A total of 36 participants who are overweight or have obesity received biweekly behavioral counseling sessions for 8-12 weeks.

Results: Significant decrease in mean weight (-2.2 ± 0.51). Significant improvement in waist circumference, blood pressure, quality of life and self-efficacy for exercise were also noted.

Implications: Implementing similar programs can help patients attain weight loss, improved control of their current or predicted disease profile, and overall improvement in quality of life.

Prediction of Child and Adolescent Weight Status by Machine Learning: A Population-based Study

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Abstract

Early prediction of non-normal weight status, especially obesity as one of the most concerned health problems is vital for prevention initiatives. This study aimed to ensure high predictive accuracy of obesity and to perform short- and long-term weight status prediction for adolescents in Hong Kong and to assess the predictors importance. A population-based retrospective cohort study was conducted using data from a territory-wide voluntary annual health assessment scheme for Hong Kong adolescent. Using demographics, diet habits, physical activity, behavior and psychological well-being, prediction models for weight status (normal/ obese/ overweight/ underweight) were generated by several multiclass machine learning approaches. We obtained data from 489,240 students who studied Primary 4 (P4, Grade 4 in US) during the academic years of 1995/96 to 2015/16; of which 430,561 studied Primary 6 (P6, Grade 6 in US). They were followed till their Secondary 6 (Grade 12 in US). The prevalence of normal weight, obese, overweight and underweight were, respectively 62.4%, 5.9%, 20.4% and 11.3% in P4 students, and 68.2%, 3.8%, 17.1% and 10.9% in P6 students. XG Boosts provided balanced accuracy over 0.60 for obese at least six years and predicted long-term weight status at S6 from P4 or P6, with an overall accuracy of 0.74 or 0.76, respectively. Assessed by the Shapley value, weight, height, age, sex, behavioral problems and self-esteem showed their important contribution for prediction. Machine learning approach offers an accurate long-term weight status prediction. This allows the early application of preventive interventions for targeted adolescents.

Keynote Talks

Emerging Field of Cardiometabolic Medicine for Cardiovascular Risk Reduction in Metabolic Disorders

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Abstract

Approximately 47 million people in the United States are affected by cardiometabolic disorders, which are comprised of interrelated factors that increase their risk of developing cardiac disease. Such factors include abdominal obesity, hypertension, elevated glucose levels or diabetes, and dyslipidemia. As a result of the intrinsic interactive complexity of these risk factors and the additive adverse effects these disorders have on developing cardiovascular disease, a collaborative, multifaceted team approach has been developed not only to identify individuals at risk but also, provide targeted interventions to lower cardiometabolic risks. Recent collaborative efforts of cardiologists, endocrinologists, and other health care specialists have targeted the creation of a new specialty, namely Cardiometabolic Medicine. As this entity continues to evolve, it aims to serve as an interface between diabetes mellitus (DM) and cardiovascular disease (CVD). The main goal of this new training is to highlight the shortfalls of current systems of cardiometabolic care as well as reduce current disparities with regards to age, sex, education, and race/ethnicity. These novel findings inform the need for nationwide clinical and public health interventions to improve cardiometabolic outcomes and health equity. Ultimately, the hope is that cardiometabolic specialists can tackle broad therapeutic goals, namely

reduction of CVD and renal risk by effective modification of metabolic disorders. Early career cardiometabolic specialists have the opportunity to develop niche ambulatory comprehensive risk reduction programs. Cardiometabolic specialists may also develop and lead innovative programs of population health management that may have broader reach, and leverage remote management tools and the expertise of pharmacists and advanced practice providers.

Food Body Weight, and Reproductive Health

Pandiyan Natarajan

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Abstract

Presentation will cover:

1) You are what you eat; You are what your mother ate. You are what your grandmother ate. I hope to elaborate the effect of on each of them on Health and Reproductive Health.

2) Effect of body weight on Reproductive Health.

3) Effect of body weight on Gestational Diabetes Mellitus.

Session: Biomarkers in Obesity and Related Disorders

Featured Presentations

Time-restricted Feeding Retains Muscle Function Through Activation of Purine Cycles and AMPK Signaling in Drosophila Obesity Models

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Abstract

Obesity caused by genetic predisposition, a lifestyle of calorie-dense diets, and circadian disruption can result in skeletal muscle dysfunction. Time-restricted feeding (TRF), where daily feeding was limited to only the active phase or first 12 hours during the day, led to improved skeletal muscle function compared to ad libitum feeding (ALF) counterparts in a high-fat diet (HFD)-induced and a genetic-induced obesity model (a sphingosine kinase 2 mutant) using Drosophila. We evaluated a potential mechanistic basis of TRF-mediated benefits in muscle by utilizing temporal transcriptomic data of indirect flight muscle (IFM) followed by genetic validations using functional, cytological, biochemical, and metabolite assessment. Transcriptomic data for both obese models showed that TRF commonly upregulated genes involved in glycine production (Sardh and CG5955) and utilization (Gnmt), as well as downregulated a key gene (Dgat2) involved in triglyceride synthesis. IFM-specific knockdown (KD) of Gnmt, Sardh, and CG5955 led to skeletal muscle dysfunction, ectopic lipid accumulation, and loss of TRF-mediated benefits. Further, IFM-specific KD of Dgat2 retained muscle function during aging and reduced ectopic lipid accumulation, which mimicked TRF-mediated benefits. Interestingly, we found upregulation of genes and increases in metabolites related to the purine cycle predominantly under HFD-TRF. Furthermore, upregulation of genes and increases in metabolites associated with AMPK signaling, glycogen metabolism, glycolysis, TCA, and ETC were predominantly found in Sk2-TRF. Both AMPK signaling and the purine cycle led to increased levels of ATP in obese models under TRF conditions, indicating that ATP plays a potential role in TRF's ability to mediate muscle improvement. Overall, our data suggested that TRF improves muscle function through modulations of glycine production/utilization and triglyceride synthesis under obesogenic challenges. Further, distinct pathways namely the purine cycle and AMPK signaling were regulated under TRF in different obesity models and may contribute to potential mechanistic foundations that underlie TRF-mediated improvement in muscle.

Discovery of Drug (Biomarker) Candidates for Specific Human Disease Based on Natural Products of Gut Microbes

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Abstract

The beneficial metabolites of the microbiome could be used as a tool for screening drugs and biomarkers that have the potential for the diagnosis and therapy of various human diseases. Narrowing down the range of beneficial metabolite candidates in specific diseases was primarily a key step for further validation in model organisms. Herein, we proposed a reasonable hypothesis that the metabolites existing commonly in multiple beneficial (or negatively associated) bacteria might have a high probability of being effective drug/biomarker candidates for specific diseases. According to this hypothesis, we screened metabolites associated with seven human diseases. For type I diabetes, 45 out of 88 screened metabolites had been reported as potential drugs/biomarker in the literature. Meanwhile, 18 of these metabolites were specific to type I diabetes. Additionally, metabolite correlation could reflect disease relationships in some sense. Our results have demonstrated the potential of bioinformatics mining gut microbes' metabolites as drug/biomarker candidates based on reported numerous microbe-disease associations and the Virtual Metabolic Human database. More subtle methods would be developed to ensure more accurate predictions.

Young Researchers Presentations

Relationship Between Emotional Eating, Consumption of Hyperpalatable Energy-dense Foods, and Indicators of Nutritional Status: A Systematic Review

Cristina Elizabeth Fuente González*, Jorge Luis Chávez-Servín, Karina de la Torre-Carbot, Dolores Ronquillo González, María de los Ángeles Aguilera Barreiro and Laura Regina Ojeda Navarro

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Abstract

People's health is closely linked to their diet. Diet can be defined as the set of foods that are consumed in a day, and it is susceptible to being altered by various factors, such as physiological, environmental, psychological, and social. These, in turn, can be affected by an inadequate diet and/or a dysregulation of emotions. Emotions are an immediate response by the organism informing it of the degree of favorability of a certain stimulus or situation. Moods are similar to emotions but more intense and prolonged. Some studies indicate that the consumption of hyperpalatable energy-dense foods may be related to emotional eating. Emotional eating is characterized by the excessive consumption of hyperpalatable energy-dense foods, rich in sugars and fats, in response to negative emotions. But several reports also indicate that emotional eating may be associated with the presence of positive emotions, so further analysis of the available information is necessary. Consuming higher amounts of hyperpalatable energy-dense foods can lead to the accumulation of energy in the body that results in an increase in body weight, as well as other associated diseases. Obesity is the world's leading diet-related health problem. The objective of this work was to carry out a systematic review of the available literature using the Cochrane methodology, in accordance with the PRISMA guidelines, to evaluate the relationship between emotional eating, the consumption of hyperpalatable energy-dense foods and indicators of nutritional status. An exhaustive search in different databases yielded 9,431 scientific articles, 45 of which met the inclusion criteria. This review underscores the fact that knowing and understanding the reasons why people consume hyperpalatable energy-dense foods and the possible connection with their emotional eating can provide key data for improving and personalizing patients' nutritional treatment.

Obesity Increases the Risk for Upper Extremity Deep Vein Thrombosis and Pulmonary Embolism in Patients With Upper Extremity Central Venous Catheters

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Abstract

Background: The morbidity and mortality of deep vein thrombosis and subsequent pulmonary embolism remains a significant burden for the healthcare system. The aim of this analysis was to examine the association of upper extremity venous thromboelism (UEVTE) and pulmonary embolism (PE) with increasing body mass index in a large database study and to further examine disposition.

Methods: The study examined the effect of obesity on patients diagnosed with UEVTE or PE who had upper extremity venous central line placement. Inpatient data from the National Inpatient Sample (NIS) from 2017-2019 was used. Patients were identified and categorized utilizing International Classification of Disease, tenth edition.

Results: A total of 1,002,831 patients were identified for analysis who had an upper extremity central line placed during an inpatient stay. There was a total of 1,690 cases of upper extremity venous thromboembolism and 3,202 cases of PE within the sample. There was an increasing odd of UEVTE in the patients with upper extremity central venous catheters (UECVC) with increasing body mass index (BMI). Patients with a BMI of 30-39 kg/m^2, 40-49 kg/m^2 and >50 kg/m^2 were significantly different than those with BMI of <19 kg/m^2 and 20-29 kg/m^2 in the UECVC group for UEVTE.

Conclusions: This study demonstrated increased odds of UEVTE for patients with increased BMI. Further research is needed to understand underlying risk in obese patients with UECVC. In the interim, practitioners should assume a greater risk for UEVTE and PE in patients with increased BMI when considering UECVC.

Abdominal Obesity and Its Determinants Among Afghan Adults

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Abstract

Objectives: Study aimed to identify lifestyles and socio-demographic determinants of abdominal obesity in Afghan adults.

Methods: Dependent variable of this study was abdominal obesity (waist circumference <88 cm for female, <102 cm for male). Exposures included physical activity, sedentary behavior, smoking, eating fruit, vegetable and processed food, place of residence, age, and family income level. Logistic regression model was used model to find out the associations with 95% confidence interval (CI).

Results: The prevalence of abdominal obesity was 17% and 51% among Afghan men and women, respectively. The prevalence of abdominal obesity was 20% and 39%-40% among age range 18-29 and 30-59 years old, respectively. Multivariate analysis showed that physical inactivity (OR: 1.29, CI: 1.06-1.58) and high daily sedentary time (OR: 1.36, CI: 1.13-1.64) increased the odds of abdominal obesity. Smoking or eating processed food frequently or eating fruit and vegetable according to WHO's guideline was not associated with abdominal obesity. Abdominal obesity progressively increased with wealth. Further, living in urban area (OR: 1.49, CI: 1.25-1.78) and being women (OR: 7.03, CI: 5.77-8.56) raised the odds of abdominal obesity. In subgroup analysis, among men, only physical activity (OR: 1.95, CI: 1.40-2.70) and among women only sedentary behavior (OR: 1.54, CI: 1.2-1.99) showed significant association with abdominal obesity.

Conclusion: Physical inactivity, high sedentary time, urban residence, and economic affluence are the main determinants of abdominal obesity among Afghan adults.

How Social Media is Fuelling the Obesity Epidemic and What You Can Do About It?

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Abstract

Social media has become an integral part of our daily lives, but its effects on our health are often overlooked. The constant bombardment of unhealthy food options and sedentary lifestyles promoted by social media can have a negative impact on our health, contributing to the rise of obesity rates. One of the primary reasons social media can lead to obesity is that it promotes sedentary behavior. Many spend hours scrolling through their feeds, liking, and commenting on posts, and chatting with friends. With so much content at our fingertips, social media can be a significant time sink. This means they are not engaging in physical activity and burning calories, which can lead to weight gain. The Hi-Life program is a comprehensive health and wellness program designed to help individuals develop healthy habits that promote a balanced lifestyle. It focuses on creating long-term changes in dietary and exercise behaviors, making it an ideal tool for combating the adverse effects of social media. One of the key features of the program is its emphasis on self-inquiry. Through guided meditation and reflective exercises, young adults are encouraged to explore their inner selves and gain greater clarity about their goals, values, and aspirations. By fostering a greater sense of self-awareness, the program aims to help young adults make more conscious decisions about how they spend their time and what activities they engage in. By providing education, support, and guidance, the program empowers young adults to take charge of their lives and create a more balanced and fulfilling lifestyle.

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