MON-LB73

Aim: To find out the incidence rate of post-thyroidectomy immediate hypocalemia within 48 hours and explore the association of pre-operative vitamin D and parathyroid hormone (PTH) levels. Methods: This retrospective study was conducted among 122 patients who underwent total thyroidectomy over one year (from January 2018 to December 2018) in Prince Sultan Military Medical City, Riyadh, Saudi Arabia. After thyroidectomy, all patients were admitted and observed for at least 24-48 hours. The postoperative hypocalemia, alkaline phosphatase (ALP), phosphate (PO4), parathyroid hormone (PTH), and vitamin D level were collected. Results: During 2018 a total of 122 (mean age 41.6±1.2 years; females 90.2%) patients underwent total thyroidectomy. The mean calcium level in the first two days was 2.07 mmol/L and 2.01 mmol/L. Most of the cases of hypocalemia occurred on day 1 postoperatively. Hypocalcemia mainly occurs in patients with benign pathology. The level of vitamin D in those patients with benign pathology was significantly lower as compared to those with malignant pathology (49±23 vs 62±25; P<0.009). The overall mean level of vitamin D was 54.6±25 (50-150 nmol/L). Interestingly, there were no correlation between pre-operative vitamin D, PTH level and postoperative hypocalemia. There were no statistically significant differences between postoperative hypocalemia with other parameters except for pre-operative alkaline phosphatase which was barely positive (P=0.052). Conclusion: The outcomes of this study manifestly illustrated that a significant decline in calcium level after the surgery. In contrast to previous studies, our findings did not show a significant correlation between vitamin D level and hypocalemia. This could be due to small sample size. Furthermore, the mean level of vitamin D in our cohort was 54 which was within the normal range. Further, well-designed randomized controlled trials with greater sample sizes are necessary to validate our findings.

Bone and Mineral Metabolism

BONE AND MINERAL CASE REPORTS I

Teriparatide and Its Bone Healing Power
Aneeta J. Joseph, MD1, Jesus L. Penabad, MD2, Antonio Pinero-Pilota, MD2.
1HCA, Hudson, FL, USA, 2Diabetes Care Center, Hudson, FL, USA.

SAT-LB64

Introduction: Teriparatide, a parathyroid hormone analog, is an important anabolic agent approved by the U.S. Food and Drug Administration to increase bone mineral density in osteoporotic patients. Parathyroid hormone (PTH) regulates calcium, phosphate, and active vitamin-D metabolites. The amino terminal peptide fragments of PTH has been known to increase bone mass and are being used in clinical practice for osteoporosis management (1). Current literature shows the efficacy of teriparatide in increasing bone density of lumbar spine and femoral neck, and decreasing the risk of vertebral and non-vertebral fractures both in postmenopausal women and men. It is also known to prevent fractures in patients with osteopenia and promote healing of fractures (2).

Case Description:
A 79-year-old Hispanic female with history of osteopenia and major lumbar spine wedge compression fractures presented to our clinic for consultation. She was onibandronate for the past four months and was having symptoms of pill esophagitis. Her last bone mineral density done on August 2017 revealed T-score of -2.5 at the lumbar spine, -1.5 at the left femoral neck, and 3.3% bone loss on the left femoral head. Rather than being started on teriparatide, zoledronic acid, or denosumab, she continued ibandronate along with calcium and vitamin D. Two months after the initial consultation, she sustained a traumatic fracture of the posterior arch and body of C2 bilaterally following a motor vehicle accident. There were discussions about starting anabolic treatment, as serial imaging did not show any significant improvement in the healing process despite the use of a collar. Two months after sustaining C2 fracture, she was started on teriparatide. Repeat cervical spine x-ray three months later showed complete healing of the C2 fracture.

Discussion:
There are a limited number of cases reported in regards to teriparatide induced healing of non-osteoporotic fractures (3). Our case is one of the very few reported to have shown complete radiographic and clinical healing of a traumatic, non-osteoporotic fracture after use of teriparatide for 12 weeks.

Adipose Tissue, Appetite, and Obesity

ADIPOSE TISSUE BIOLOGY AND OBESITY II

The Relationship Between Alcohol Consumption Patterns and Insulin Sensitivity in Obesity
Katrina Han, MD1, Dominic Nicholas Reeds, MD2, Julia Passyn Dunn, MD3.
1Washington University in St. Louis, Saint Louis, MO, USA, 2WASHINGTON University - ST LOUIS, Saint Louis, MO, USA, 3VA St. Louis Health Care System, Saint Louis, MO, USA.

SUN-LB103

BACKGROUND The effects of alcohol intake on insulin sensitivity have produced conflicting results with both beneficial and adverse effects observed. This study aimed to compare the relationship between patterns of alcohol consumption and insulin sensitivity in obese Veterans. METHODS We performed a cross-sectional study of obese (BMI 30.0-45.0 kg/m2), non-diabetic U.S. Military Veterans without active mental health diagnoses, including no report of dependent alcohol use within the last 12 months. Alcohol exposure over the previous 12 months (mos) was assessed using a study-developed questionnaire and Michigan Alcoholism Screening Test (MAST). Fasting insulin, glucose, and a 75gm OGTT were completed to determine Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) and prediabetes (preDM) score of 0, 1, or 2 based on fulfilling 0, 1, or at least 2 of the ADA criteria for preDM, respectively. Linear regression was used to assess for associations between measures of insulin resistance and alcohol consumption; unstandardized β and p-value are reported for variable of interest. RESULTS 104 Veterans participated (66% males; 44±8years (range: 25-60);
BMI 36±4kg/m² (range: 29-45); 53% White, 46% African American, 2% Alaskan/Native American, 1% Other. 83 participants reported any alcohol intake in the previous 12 mos and neither preDM score (p=0.57) nor HOMA-IR (p=0.14) were predicted by this question. PreDM score groups were similar in gender, BMI, and weight, but age predicted both preDM score (r²=0.09, β=0.025, p=0.006) and HOMA-IR (r²=0.05, β=0.09, p=0.034); therefore, all regressions were adjusted for age. There was a negative association between the number of days of alcohol intake with HOMA-IR (β=−0.271, p=0.037) but no association occurred with preDM score (p=0.15). Fewer days of binge drinking was associated with higher HOMA-IR (β=−0.342, p=0.058) and preDM score (β=−0.075, p=0.05). There was no significant association between total quantity of alcohol intake and HOMA-IR (p=0.13) nor preDM score (p=0.15). There was no association between MAST score and HOMA-IR (p=0.7) or preDM score (p=0.3).

CONCLUSION: In our cohort of obese, non-alcohol dependent Veterans, the reported number of days of alcohol intake and days of binge drinking in the previous 12 mos were lower in those with markers of insulin resistance. These results suggest that drinking patterns among obese patients may have unique effects on insulin sensitivity that warrant further investigation.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS I

Metformin-Use Is Associated With Slowed Cognitive Decline and Reduced Incident Dementia in Older Adults With Type 2 Diabetes Mellitus: The Sydney Memory and Ageing Study.

Katherine Samaras, MBBS, PhD, FRACP1, Steve Makkar, PhD2, John D. Crawford, PhD3, Nicole A. Kochan, PhD3, Wei Wen, PhD4, Draper Brian, MD5, Julia N. Trollor, PhD5, Henry Brodaty, PhD5, Perminder S. Sachdev, PhD5.

1St Vincent's Hospital, Sydney NSW, Australia, 2University of New South Wales, Sydney NSW, Australia, 3University of NSW, Sydney NSW, Australia, 4University of NSW Sydney, Sydney NSW, Australia.

SAT-LB115

Background: Metformin use in diabetes has been associated with both increased and decreased dementia rates in observational studies of people with diabetes.

Objective: To examine changes in global cognition and specific cognitive domains over 6 years in older adults with diabetes treated with metformin, compared to other glucose lowering medications, and to people without diabetes.

Methods: Data were examined from the Sydney Memory and Ageing Study, a prospective observational study of 6 years duration of 1037 non-demented community-dwelling elderly aged 70-90 at baseline, derived from a compulsory electoral roll. Neuropsychological testing was performed every 2 years with domain measures of memory, executive function, language, visuospatial function, attention and processing speed and a composite of global cognition. Data were analysed by linear mixed modelling, including age, sex, education, body mass index, heart disease, diabetes, hypertension, stroke, smoking and apolipoprotein E ε4 carriage as covariates.

Results: At baseline, 123 participants had diabetes (DM) with 67 receiving metformin (DM+MF) who were similar in demographics to those not receiving metformin (DM-noMF) and those without diabetes (no-DM). Participants with diabetes had higher BMI, lower HDL- and LDL-cholesterol and more prevalent heart disease, hypertension and smoking, compared to no-DM.

Over 6-years, DM+MF participants had significantly slower rates of decline in global cognition and executive function, compared to DM-noMF, adjusted for covariates. The rate of decline for each cognitive domain was similar between DM+MF and controls. No impact was found in analyses examining interactions with sex, ApoE4 carriage or hyperlipidemia. No difference was found in the rate of decline in brain volumes between the groups over 2 years.

Incident dementia was significantly higher in DM-noMF, compared to DM+MF (adjusted OR 5.29 [95% CI 1.17-23.88], p=0.05), whereas risk of incident dementia was similar between DM+MF and participants without diabetes.

Conclusions: In older people with diabetes receiving metformin, rates of cognitive decline and dementia were similar to that found in people without diabetes and significantly less than that found in people with diabetes not receiving metformin. Large randomized studies in people with and without diabetes are required to determine whether these associations can be attributed to metformin alone or if other factors explain these observations. Future studies will clarify if this cheap and safe medication can be repurposed for prevention of cognitive decline in older people.

Cardiovascular Endocrinology

VASCULAR DISEASE AND PATHOPHYSIOLOGY

Low Density Lipoprotein Receptor and Proprotein Convertase Subtilisin/Kexin Type 9 Kinetics Using Heavy Water (2H2O) Labeling and Mass Spectrometry

Mohamad Dandan, BS, Marc Hellerstein, MD, PhD.

UC Berkeley, Berkeley, CA, USA.

SAT-LB95

Abnormally high blood cholesterol levels in low density lipoprotein (LDL) increases the risk of heart disease. Cell surface receptors such as LDL-receptors (LDLr) regulate the clearance of LDL from blood circulation. As cholesterol levels decrease, cells promote cholesterol synthesis and cholesterol uptake by increasing LDLr expression. Another regulatory protein of plasma cholesterol clearance is proprotein convertase subtilisin/kexin type 9 (PCSK9). It is secreted from the liver into circulation where it can bind to and target LDLr to the lysosome for subsequent degradation. The current model of cholesterol regulation describes how increased cholesterol content down-regulates the number of LDLr promoted by PCSK9 mediated degradation, however minimal knowledge is not known about LDLr and PCSK9 kinetics using heavy water labeling, and how cholesterol enriched diet affects LDLr and PCSK9 kinetics in vivo. Therefore, our objective(s) were to establish a method 1) to measure the kinetics of LDLr and PCSK9 via stable isotopic metabolic labeling with heavy water (2H2O)