incidence for GC-induced hyperglycemia was 33.5% (812 patients) and 3.7% of patients (n=89) had at least one documented hypoglycemia during the hospital stay. Compared to normoglycemic patients, GC-induced hyperglycemia was associated with a 40% increase in the risk for the combined primary endpoint (unadjusted odds ratio 1.39, 95% CI 1.16-1.66). This was also true after adjusting the analysis for age, Charlson comorbidity index and GC dose (adjusted odds ratio 1.68, 95% CI 1.25-2.26). Hypoglycemia was also associated with a doubling in the risk for the combined primary endpoint (odds ratio 1.95, 95% CI 1.2-3.17).

**Discussion/Conclusion:** Mortality, cardiovascular events and rate of infections were markedly higher in patients with GC-induced hyperglycemia compared to normoglycemic patients. Hypoglycemia was infrequent, but also associated with higher risk for adverse outcome. Future studies should evaluate whether glucose control with novel treatment modalities has a beneficial effect on clinical outcomes in patients with GC-induced hyperglycemia.

**Thyroid**

**HPT-AXIS AND THYROID HORMONE ACTION**

**Phthalates Expose and Thyroid Parameters in Euthyroid Patient with Type 2 Diabetes: Sex Specific Associations**

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**SAT-440**

Phthalates are ubiquitous in different environmental exposure media around the world. Recent years, issues on the relationships of phthalates and endocrine disorders raise attention. Evidence of thyroid disruption as a result of phthalates exposure among euthyroid participants with diabetes is very limited. We aimed to evaluate the association between phthalate and thyroid function, and to explore whether thyroid autoimmunity mediated this association. Congruent urine and blood samples were collected from 538 participant in METAL study. We measured urinary concentrations of ten phthalate metabolites (urinary creatinine adjusted), along with serum levels of thyroid-stimulating hormone (TSH), free thyroxin (FT₄), free triiodothyronine (FT₃), thyroxin peroxidase antibody (TPOAb) and thyroglobulin antibody (TgAb).

Euthyroidism was defined as TSH within normal range. After adjusting for age, sex (only with the entire sample), BMI and smoking status, linear regression analyses showed exactly opposite directional results among men and women. TSH levels were negatively associated with mono-2-ethyl-5-carboxypentylphthalate (MECPP), mono-2-ethyl-5-hydroxyethylphthalate (MEHHP), mono-2-ethyl-5-oxoethylphthalate (MOEHP), mono-2-carboxymethyl-hexyl phthalate (MCMHP) and sum of di (2-ethylhexyl) phthalate metabolites (ΣDEHP₉) in men, but positively associated with monoisobutylphthalate (MiBP) and mono-n-butylphthalate (MnP) in women. Meanwhile, FT₄ was positively associated with mono-2-ethylhexylphthalate percentage (%MEHP) in men, but negatively associated with MnBP, MEHHP and MCMHP in women. Further, in women, TPOAb was increasing along with the increased level of MEHHP and %MEHP. In the mediation analysis, TPOAb demonstrated a mediating effect whereby MEHP or %MEHP had a positive effect on TSH and a negative effect on FT₄, only in women (all P<0.05). We got a conclusion that among euthyroid participants with diabetes, urinary phthalate metabolites maybe associated with altered TSH, FT₄ and TPOAb levels in different direction in men and women. Further, our present study maybe the first to suggest that TPOAb might be a potential mediator of the association between phthalate metabolites and thyroid function in women.

**Adrenal**

**ADRENAL - CORTISOL EXCESS AND DEFICIENCIES**

**Telomere Length as a Novel Prognostic Marker of Cushing Complications**

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**MON-190**

Telomeres are small sequences at the end of chromosomes, protecting them from abnormal degradation. Certain conditions, like cancer, have been associated with changes in telomere length (TL), which, in turn, may predict outcomes of the disease. Studies on the effect of cortisol on TL have not led to conclusive results or are limited in stress induced hypercortisolemia. Moreover, no study has focused on effects of persistent endogenous hypercortisolemia during childhood, a known important period for telomere modifications.

We hypothesized that TL is affected in pediatric patients with endogenous Cushing syndrome (CS) and it correlates with markers and complications of hypercortisolemia. We studied 10 pediatric patients (mean age: 13.3 years, 7 females), diagnosed and treated successfully for Cushing disease. TL of total lymphocytes and their subtypes (Naïve T-cells, Memory T-cells, B-cells and NK-cells) were measured before and 1 year after treatment. TL was compared to age-matched control samples (6-8 per age group) and statistical tests were performed, as appropriate. Lymphocyte TL of patients with active CS did not differ from controls (p=.43). B-cell and NK-cell TLs were shorter after cure compared to active CS [mean B-cell TL difference: -1.44 Kb (-15%), p=.001; mean NK-cell difference: -0.51 Kb (-7%), p=.10] and controls [mean B-cell TL difference: -0.98 (-11%), p=.039; mean NK-cell difference: -1.3 Kb (-16%), p=.005]. Lymphocyte TL in active CS and the change of TL before and after cure did not correlate with measured markers of hypercortisolemia (morning and
Bone and Mineral Metabolism

OSTEOPOROSIS: DIAGNOSIS AND CLINICAL ASPECTS

Deterioration of Bone Microarchitecture in Prediabetes Is Partly Mediated Through Fibroblast Growth Factor 21

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SUN-372

Introduction: Prediabetes has been reported to be associated with a worse trabecular bone score (TBS). Fibroblast growth factor 21 (FGF21) levels are raised in prediabetes and other insulin-resistant states, and FGF21 has been reported to be implicated in bone metabolism. We compared the bone mineral density (BMD) and TBS between prediabetes and normoglycemia, and studied the correlation of FGF21 with BMD and TBS. Method: Chinese postmenopausal women aged between 55 and 80 without type 2 diabetes were recruited from the Hong Kong Cardiovascular Risk Factor Prevalence Study between November 2016 and October 2018. Participants were excluded if they were already on anti-osteoporosis therapy, had secondary causes of osteoporosis, or had body mass index (BMI) <15 or >37 kg/m² (when TBS measurement may not be accurate), or had an estimated glomerular filtration rate (eGFR) <30mL/min. They were divided into prediabetes (defined as fasting glucose ≥6.6mmol/L or HbA1c ≥5.7%) and normoglycemia. BMD and TBS were measured by dual-energy X-ray absorptiometry. Serum FGF21 levels were measured with an in-house ELISA kit. Results: 258 participants were included (130 prediabetes and 128 normoglycemia), with a mean age of 61.5±5.1years and mean BMI of 24.2±3.7kg/m². BMD over lumbar spine, femoral neck and total hip were all comparable between prediabetes and normoglycaemia, while TBS was lower in prediabetes (1.27±0.07 vs 1.30±0.07, p=0.007), which remained significant after adjustment for age and BMI. Serum FGF21 levels did not correlate with BMD but inversely correlated with TBS. On multiple linear regression models, serum FGF21 levels showed an independent inverse correlation with TBS (standardized beta -0.13, p=0.031), which remained significant with the inclusion of homeostasis model assessment of insulin resistance (HOMA-IR) in the model. Conclusion: Among Chinese postmenopausal women, bone quality was worse in prediabetes despite comparable bone density. Serum FGF21 levels showed a significant independent correlation with TBS, suggesting the potential impact of FGF21 on the deterioration of the bone microarchitecture in prediabetes.

Tumor Biology

TUMOR BIOLOGY: DIAGNOSTICS, THERAPIES, ENDOCRINE NEOPLASIAS, AND HORMONE DEPENDENT TUMORS

Regional Hyperthermia Enhances Selective Mesenchymal Stem Cell Migration Towards the Tumor Stroma

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SUN-120

The tumor homing characteristics of mesenchymal stem cells (MSCs) make them attractive vehicles for the tumor-specific delivery of therapeutic agents, such as the sodium iodide symporter (NIS). NIS is a theranostic protein that allows non-invasive monitoring of the in vivo biodistribution of functional NIS expression by radioiodine imaging as well as the therapeutic application of 131I. To enhance the actively recruitment of MSCs to growing tumor stroma and thereby trigger targeted delivery of the NIS gene to the tumor, we examined the combination with regional hyperthermia, as heat induces the secretion of immunomodulatory chemokines, cytokines and growth factors, well-known attractants of MSCs. Human hepatocellular carcinoma cells (HuH7) were heat-treated in a water bath at 41 °C for 1h, followed by incubation at 37 °C for 0-48h. mRNA and protein levels of chemokines involved in MSC migration was analyzed by RT-PCR and ELISA. Chemotaxis of MSCs in relation to a gradient of supernatants was tested in a 3D live cell tracking migration assay. In a subcutaneous HuH7 mouse xenograft tumor model, a single systemic injection of CMV-NIS-MSCs was applied 6h, 24h, 48h after or 24h, 48h before hyperthermia treatment and tumoral 123I accumulation was assessed by 123I-scintigraphy. Ex vivo NIS analysis of tumor sections was performed by RT-PCR and