midnight cortisol, urinary free cortisol or ACTH levels). However, there was a strong inverse correlation between the difference of TL in active disease compared to controls and triglyceride level for all lymphocyte subtypes (range r= -0.74 to -0.86, range *p*= .003 to *p*=.022), suggesting that the higher the triglyceride levels, the shorter the TL in patients with CS. Additionally, inverse correlation was observed for weight and BMI SDS and B-cell TL, specifically (r= -0.76, *p*= .019 and r= -0.76, *p*= .018, respectively). Furthermore, there appeared to be an implication for shorter TL in CS patients with dyslipidemia compared to those without (mean TL difference from controls: -1.1 Kb in patients with dyslipidemia vs 0.53 Kb in those without, *p*= .067).
We conclude that although TL in active CS does not seem to differ from controls, B-cell and NK-cell TLs are affected after cure, and this may be related to acute changes that occur in the immune system peri- and post-operatively. Interestingly, the level of TL shortening correlates strongly with several complications of CS, including weight, BMI and dyslipidemia. This suggests that TL may be used as a surrogate prognostic marker of hypercortisolemia-related complications.

Bone and Mineral Metabolism

OSTEOPOROSIS: DIAGNOSIS AND CLINICAL ASPECTS

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

David TW Lui, MBBS, Chi Ho Lee, MBBS, Vicky WK Chau, MPH, Carol HY Fong, MStat, Kristy MY Yeung, MSc, Joanne KY Lam, MBBS, Alan CH Lee, MBBS, Wing Sun Chow, MBBS, Kathryn CB Tan, MD, Yu Cho Woo, MBChB, Karen SL Lam, MD.
The University of Hong Kong, Queen Mary Hospital, Hong Kong, Hong Kong.

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 and 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, had body mass index (BMI) <15 or >37 kg/m^2 (when TBS measurement may not be accurate), or had an estimated glomerular filtration rate (eGFR) <30mL/min. They were divided into prediabetes (defined by fasting glucose ≥5.6mmol/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/m^2. 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

Mariella Tutter, PhD student[1], Christina Schug, PhD[1], Kathrin Alexandra Schmohl, Master of Science[1], Nathalie Schwenk, Technician[1], Matteo Petrini, PhD student[2], Lars H. Lindner, MD[2], Peter J. Nelson, PhD[1], Christine Spitzweg, MD[1].
[1]Department of Internal Medicine IV, University Hospital of Munich, LMU Munich, Munich, Germany, [2]Department of Internal Medicine III, University Hospital of Munich, LMU Munich, Munich, Germany.

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 ^{131}I. 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 ^{123}I accumulation was assessed by ^{123}I-scintigraphy. *Ex vivo* NIS analysis of tumor sections was performed by RT-PCR and

immunohistochemistry. The optimal imaging regime was then used for a ^{131}I therapy study.
Chemokine mRNA and protein analysis indicated a substantial increase in expression levels of chemokines and growth factors, involved in MSC tumor homing, after heat exposure. In addition, MSCs showed directed migration towards the supernatant of thermo-stimulated cancer cells. *In vivo*, with the optimal regime, we observed a significantly increased uptake of ^{123}I in tumors of heat-treated animals (41 °C) when thermostimulated 24h after CMV-NIS-MSC injection compared to control animals (37 °C). Immunohistochemical staining of tumor sections showed strong tumoral NIS-specific immunoreactivity and RT-PCR an increased NIS mRNA expression in heat-treated tumors, thereby confirming tumor-selective, temperature-dependent MSC migration. CMV-NIS-MSC-mediated ^{131}I therapy combined with regional hyperthermia resulted in a reduced tumor growth that was associated with prolonged survival of regional heat-treated animals compared to normothermic mice and to the saline control group.
In summary, we have demonstrated a significantly increased, selective MSC migration towards the tumor stroma after regional hyperthermia in the ^{123}I imaging study. The combination of MSC-mediated NIS gene therapy with mild regional hyperthermia resulting in stimulated therapeutic efficacy of NIS-mediated ^{131}I therapy.

Adrenal

ADRENAL - TUMORS

Adrenal Incidentalomas: Prevalence and Referral Patterns in a UK University Hospital Using Real-Life Data

Fahmy W F Hanna, MSC,MD,FRCP[1], Sarah Hancock, N/A[1], Cherian George, FRCR, MBBCh[1], Basil George Issa, MBBCh, MD, FRCP[2], Gillian Powner, BN[1], Julian Waldron, FRCPath[1], Anurag Golash, FRCS, MBBCh[1], Anthony Fryer, FRCPath, PhD[1].
[1]UNIV HOSP OF N STAFFORDSHIRE, Stoke on Trent, United Kingdom, [2]Manchester University Foundation Trust, Manchester, United Kingdom.

SAT-174

The estimated prevalence of adrenal incidentaloma at abdominal CT scan is 0.5-2% (1). However, from clinical practice, we noticed that incidentalomas are referred from other imaging modalities (eg MRI) and of other sites (eg thorax, spine). We therefore explored the relationship between prevalence rates and (i) imaging modality and (ii) its change over time, in a real world clinical setting from a large UK teaching hospital/trauma centre. We also examined the referral pattern of potential lesions to endocrinology. We extracted data from all radiology reports for all CT and MRI scans from Jan 2018-Oct 2019. We utilised a key phrase search strategy (eg adrenal adenoma/lesion/mass/nodule/incidentaloma, incidental adrenal, indeterminate adrenal). Where possible we excluded false hits (eg no adrenal lesion). These were linked to the referral patterns as identified by a referral logged or an attendance (new or follow-up) to endocrine clinic 3 months post index scan. Preliminary data showed that, from a total of 127878 scans performed, 2604 potential lesions were reported (prevalence 2.0%), comprising 2496/88838 (2.8%) CT scans and 108/39040 (0.3%) MRI scans. The number of scans/month increased in 2019 vs 2018 (6.9% for CT and 12.6% for MRI). Only 9.0% and 15.7% of reported potential lesions detected by CT and MRI, respectively, were referred for endocrine review. Hence, MRI patients were more likely to be referred than those with CT scans (p=0.018). Referral rates were lower in 2019 than 2018 (8.6% vs 14.4%; p less than 0.001). This approach has its limitations but allows efficiently review of large cohorts. Adrenal incidentalomas pose a rising challenge in view of increasing reliance on scanning. Despite a dedicated adrenal multidisciplinary team with a national track record in improving management of incidentalomas (2), the referral rate of potential lesions is worryingly low and not improving, with >90% of cases overlooked. This work is part of on-going innovation to enhance the pick-up rate for these cases whilst addressing the increased endocrine workload in a cost-effective manner. 1. Barzon L, Sonino N, Fallo F, Palu G, Boscaro M. Prevalence and natural history of adrenal incidentalomas. Eur J Endocrinol. 2003;149:273-285. 2. Hanna FWF, Issa BG, Lea SC, George C, Golash A, Firn M, Ogunmekan S, Maddock E, Sim J, Xydopoulos G, Fordham R, Fryer AA. Adrenal lesions found incidentally: how to improve clinical and cost-effectiveness. BMJ Open Quality. 2019;In press.

Genetics and Development (including Gene Regulation)

GENETICS AND DEVELOPMENT AND NON-STEROID HORMONE SIGNALING I

IIM May Influence Matured Oocytes' DNA Methylation of PCOS Patients

Congru Li, PhD, Yang Yu, PhD.
Peking University Third Hospital, Beijing, China.

SUN-715

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of childbearing age and is the main cause of anovulatory infertility. To increase the number of oocytes obtained, controlled ovarian stimulation (COS) has become a routine choice for in vitro fertilization-embryo transfer (IVF-ET), which is one of the common assisted reproductive technologies for PCOS patients. However, for these patients, there is a high risk of ovarian hyperstimulation syndrome (OHSS). Obtaining in vitro maturation (IVM) of immature oocytes, and then in vitro fertilization and embryo transfer of mature oocytes provides a possible way for people to solve the above problems. Since the IVM technology will expose oocytes to in vitro conditions for a longer period of time, theoretically increasing the risk of the oocytes being affected by the culture environment, further research and explorations are needed for study in gene programming, epigenetics, etc. Therefore, to explore the impact of IVM operation on embryonic development is of great significance for further clarifying assisted reproductive safety and improving IVM operation conditions. Here we focused on DNA methylation reprogramming process which was essential for embryonic development. We tested the DNA methylation of sperm, IVM oocytes and IVM generated early stage embryos including pronucleus,