and "Osteoporosis" (OST) (≤-2.5). We classified our patients according to fracture site, in vertebral, humeral, hip, tibial, malleolar-carpal, radial-ulnar and others, including rib fractures. Ratios were compared with χ^2 test, and continuous variables with one-way ANOVA.

Results: We enrolled 444 consecutive subjects with 543 fractures. n=315 (71.0%) subjects had low BMD: OST 25.9% and LBM 45.1%. Among subjects <50 years of age, 43.1% had LBM and 9.2% OST, while in those >50, 46.3% had LBM and 36.6% OST (p<0.0001). The cohort's mean lowest T/Z score was -1.6±1.2. Subjects with >1 fracture had more frequently low T/Z score (p=0.015). History of vertebral fractures provided the lowest mean T/Z score overall (-2.4±1.1), in females (-2.5±0.9) and subjects >50 (-2.5±1.1). The same holds true for hip fractures in males (-1.9±1.2) and subjects <50 (-2.1±1.4). Subjects with vertebral fractures had the lowest Hip (-1.7±1.2) and Spine (-2.3±1.2) T/Z scores, while those with tibial fractures had the lowest Radius T/Z score (-1.8±1.3). History of vertebral fractures was associated with the highest rate of OST (65.9%) in our overall population, males (50%), females (67.5%), subjects >50 (70.0%), while subjects with history of tibial fractures had the highest rate of normal BMD (46.2%), in males (80%) and females (50.4%), and those <50 (75.0%). Vitamin-D deficiency was present in 81.4% of all subjects. PTH was significantly higher in patients with OST compared to LBM or normal BMD (p=0.0006).

Discussion: Patients with history of high energy fractures need to be screened with DEXA scan early, as they have high likelihood to suffer from osteoporosis.

Pediatric Endocrinology
PEDIATRIC OBESITY, THYROID, AND CANCER

The Effect of Body Mass Index on the Peak Growth Hormone Level After Growth Hormone Stimulation Test in Children with Short Stature

Nayeong Lee, MD[1], Wonkyoung Cho, PhD[1], Yoonji Lee, MD[2], Seulki Kim, MD[2], Seonhwa Lee, MD[3], Yujung Choi, MD[3], Moon Bae Ahn, MD[2], Shinhee Kim, MD[4], Kyoungsoon Cho, PhD[5], Min-Ho Jung, MD,PHD[3], Byung-kyu Suh, PhD[2].

[1]Department of Pediatrics, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [2]Department of Pediatrics, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [3]Department of Pediatrics, Yeouido St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [4]Department of Pediatrics, Incheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [5]Department of Pediatrics, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of.

MON-113

Objective: The aim of this study is to evaluate the effect of body mass index (BMI) on peak growth hormone (GH) response after GH stimulation test in children with short stature.

Methods: Data was obtained from retrospective review of medical records who visited the pediatric endocrinology at St. Vincent hospital of catholic university for short stature from January 2010 to June 2019. We studied 115 children (aged 3-17 years old) whose height was less than 3percentile for one's age and sex and who underwent GH stimulation test {GH deficiency (GHD) = 47, Idiopathic short stature (ISS) = 68}. Peak GH response was stimulated by dopamine (n=111), clonidine (n=7), glucagon (n=19), insulin (n=56) and arginine (n=32). Birth weight, parental height, chronologic age, bone age, height SDS (standard deviation score), weight SDS, BMI SDS hemoglobin, fT4, T3 TSH, cortisol, ACTH, GH, IGF-1 SDS, IGF-BP3 SDS and peak stimulated GH were analyzed.

Results: In the characteristics of subject, weight SDS and BMI SDS in GHD group were increased than ISS group (p<0.000, p=0.000). Free T4 was decreased in GHD group than ISS group (p=0.012). In total group, BMI SDS was associated negatively with peak GH level stimulated by dopamine (r=-0.419, p<0.000), insulin (r=-0.271, p=0.044) and arginine (r=-0.368, p=0.038), but did not showed correlation with peak GH level stimulated by glucagon. In GHD group, BMI SDS showed negative correlation with peak GH level using dopamine (r=-0.356, p=0.015) and arginine (r=-0.509, p=0.022). In ISS group, BMI SDS was correlated negatively with peak GH using dopamine (r=-0.330, p=0.007). In multivariate regression analysis of GHD group, weight SDS and BMI SDS were the only two significant predictors of peak GH response in stimulation test stimulated by dopamine (ß=-0.576, p=0.015) and arginine (ß=-0.097, p=0.022). In ISS group, only mother's height (ß=0.474, p=0.000) and TSH (ß=-2.251, p<0.000) were demonstrated statistically significant predictors of peak GH stimulated by dopamine in multivariate regression analysis. In case of using insulin as a stimulant in ISS group, there is nothing which has statistical significance as a predictor of peak GH response in multivariate regression analysis.

Conclusion: BMI was associated negatively with peak GH response after GH stimulation test in children with short stature, especially in GHD group.

Adrenal
ADRENAL - TUMORS

Adrenocortical Carcinoma - A Tertiary Center's Recent 5-Year Experience

Michal Ehrenwald, MD[1], Karen Michele Tordjman, MD[1], Naftali Stern, MD[1], Joseph Klausner, MD[2], Ido Nachmany, MD[2], Guy Lahat, MD[2], Nir Lubezky, MD[2], Yaakov Goykhman, MD[2], Ido Wolf, MD[3], Ravit Geva, MD[3], Asaf Aizic, MD[4], Sophie Barnes, MD[5], Yona Greenman, MD[1], Esther Osher, MD, PHD[1].

[1]Institute of Endocrinology, Metabolism and Hypertension, Tel Aviv Sourasky Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [2]Department of Surgery, Tel Aviv Sourasky Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [3]Department of Oncology, Tel Aviv Sourasky Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [4]Institute of Pathology, Tel Aviv Sourasky Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [5]Department of Radiology, Tel Aviv Sourasky Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.

SAT-180

BACKGROUND: Adrenocortical carcinoma (ACC) is a rare endocrine malignancy with poor prognosis. The aim of

this study was to characterize patients diagnosed with ACC at a single center between 2014-2019.

METHODS: We retrospectively reviewed data regarding demographics, tumor characteristics and functionality, treatment and survival.

RESULTS: The study cohort included 27 subjects (56% females), followed for 27±10.6 months. The mean age at diagnosis was 49.4±9 years. Co-morbidities at presentation included hypertension (63%), diabetes mellitus (22%) and dyslipidemia (26%). 74.1% of tumors were functioning – of which 85% were cortisol-secreting and 15% androgen-secreting. Aldosterone was secreted additionally in 15%. ENSAT stage at diagnosis was stage 1 in 15%, stage 2 in 35%, stage 3 in 12% and stage 4 in 38%. Eighty-nine % of patients underwent surgery. Treatment with mitotane was initiated in 82% of patients, reaching a mean maximal dose of 3.3 ±0.4 grams/day. Chemotherapy and/or radiation were given in 37% and 22%, respectively. Several patients (14.8%) had a second primary cancer, diagnosed before ACC in 75%. Progression was observed in 48% of patients, with a progression-free survival of 8.3±6.6 months. Thirty-five % of patients died during follow up, time to death was 12.8±0.4 months. Twenty two % of patients survived over 30 months after diagnosis. KI67 above 20% or stage above 2 negatively affected survival.

CONCLUSIONS: ACC remains a rare disease with a poor prognosis. However, it is a heterogeneous disease, with some patients achieving survival of over 30 months after diagnosis. Further characterization of this population may improve our understanding of the biology and treatment of this rare disease.

Genetics and Development (including Gene Regulation)

GENETICS AND DEVELOPMENT AND NON-STEROID HORMONE SIGNALING I

Associations of GPR174 and ITM2A Genes on X Chromosome with Early Onset Autoimmune Thyroid Disease in Korean.

Nayeong Lee, MD[1], Wonkyoung Cho, PhD[1], Hyeri Shin, MD[2], Yoonji Lee, MD[3], Seulki Kim, MD[3], Seonhwa Lee, MD[4], yujung choi, MD[4], Moon Bae Ahn, MD[3], Incheol Baek, PhD[2], Shin-Hee Kim, MD[5], Kyoungsoon Cho, PhD[6], Min-Ho Jung, PhD[4], Taigyu Kim, PhD[7], Byung-Kyu Suh, MD[3].

[1]Department of Pediatrics, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [2]The Catholic University College of Medicine Hematopoietic Stem Cell Bank, Seoul, Korea, Republic of, [3]Department of Pediatrics, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [4]Department of Pediatrics, Yeouido St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [5]Department of Pediatrics, Incheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [6]Department of Pediatrics, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [7]The Catholic University College of Medicine Microbiology, Seoul, Korea, Republic of.

SUN-724

Background: Autoimmune thyroid diseases (AITDs) are female predominant and the biology of sexual dimorphism is not clearly understood. Recently, *GPR174 and ITM2A* on X chromosome have been newly suggested as autoimmune thyroid disease susceptible loci.

Methods: Fourteen single nucleotide polymorphisms in immune related genes on X chromosome were analyzed in 108 Korean children (girls =90, boys =18) with AITD [Hashimoto disease (HD) = 40, Graves' disease (GD) = 68, thyroid-associated ophthalmopathy (TAO) = 37, and non-TAO =60] with gender ratio matched normal control 106 controls (female = 43, male = 63).

Results: In AITD, the frequencies of GPR174 rs3810711 T allele (OR=6.0, cP=0.000), GRP174 rs3827440 T allele (OR=6.0, cP=0.000), ITM2A-GPR174 rs5912838 A allele (OR=2.7, cP=0.001) were increased and of GPR174 rs3810711 CC genotype (OR=0.2, cP=0.000), GRP174 rs3827440 CC genotype (OR=0.2, cP=0.000), ITM2A-GPR174 rs5912838 CC genotype (OR=0.4, cP=0.000)were lower than controls. In GD, the frequencies of GPR174 rs3810711 T allele (OR=8.4, cP=0.000), GRP174 rs3827440 T allele (OR=8.4, cP=0.000), ITM2A-GPR174 rs5912838 A allele (OR=3.3, cP=0.000) were increased and GPR174 rs3810711 CC genotype (OR=0.1, cP=0.000), C allele (OR=0.5, cP=0.044), GRP174 rs3827440 CC genotype (OR=0.2, cP=0.000), C allele (OR=0.5, cP=0.044), ITM2A-GPR174 rs5912838 CC genotype (OR=0.4, cP=0.000) were lower than controls. In HD, the frequencies of GPR174 rs3810711 T allele (OR=3.9, cP=0.003), GRP174 rs3827440 T allele(OR=3.9, cP=0.003) were increased and GPR174 rs3810711 CC genotype (OR=0.3, cP=0.004), rs3827440 CC genotype (OR=3.9, cP=0.003) were lower than controls. In thyroid-associated ophthalmopathy, the frequencies of GPR174 rs3810711 T allele (OR=7.9, cP=0.000), GRP174 rs3827440 T allele (OR=7.9, cP=0.000), ITM2A-GPR174 rs5912838 A allele (OR=3.1, cP=0.001) were increased and of GPR174 rs3810711 CC genotype (OR=0.1, cP=0.000), GRP174 rs3827440 CC genotype (OR=0.1, cP=0.000), ITM2A-GPR174 rs5912838 CC genotype (OR=0.3, cP=0.014)were lower than controls.

Conclusions. Our results suggest that polymorphisms of *GPR174 and ITM2A* genes on X chromosome might contribute to the pathogenesis of AITD.

Reproductive Endocrinology

MALE REPRODUCTIVE HEALTH - FROM HORMONES TO GAMETES

Effects of Testosterone Replacement on Glycemic Control and Other Cardiovascular Risk Factors in Hypogonadal Men with Uncontrolled Type 2 Diabetes (Stride Study): Design, Implementation and Baseline Data

Preethi Mohan Rao, MBBS, CCST Diabetes and Endocrinology[1], Enis Mumdzic, Specialty Registrar in Endocrinology and Diabetes[1], Daniel Marcus Kelly, BSc, PhD[2], Thomas Hugh Jones, BSc, MBChB,MD, FRCP(London), FRCP(Edinburgh)[3].

[1]Barnsley Hospital NHS Trust/University of Sheffield, Sheffield, United Kingdom, [2]University of Sheffield, Sheffield, United Kingdom, [3]Barnsley Hospital / University of Sheffield, Barnsley S Yorkshire, United Kingdom.

SAT-051

Up to 40% of men with type II diabetes are testosterone deficient. There is growing evidence that testosterone therapy has a beneficial effect on glycemic control, insulin