Genetics and Development (including Gene Regulation)
ENDOCRINE DISRUPTING CHEMICALS II
Perfluoroalkyl Substance Exposure Was Negatively Associated With Cortisone Levels in Pregnancy
Anja Fenger Dreyer, BA1, Richard Christian Jensen, MD, PhD2, Dorte Glinborg, MD, PhD, DMSc2, Anne Vibke Schmedes, MSc, PhD3, Ivan Brandslund, MD, DMSc2, Flemming Nielsen, MSc, PhD2, Henriette Boye Kyhl, MSc2, Tina Kold Jensen, MD, PhD1, Marianne Andersen, MD, PhD, DMSc2.
1University of Southern Denmark, Odense C, Denmark, 2Odense University Hospital, Odense C, Denmark, 3Lillebaelt Hospital, Vejle, Denmark.

MON-LB131
Introduction: During pregnancy, maternal cortisol levels are increased threefold by third trimester. The enzyme 11β-hydroxysteroid dehydrogenase (11β-HSD, isoforms 1 and 2) regulates cortisol levels by the conversion between cortisol and cortisone. Perfluoroalkyl substances (PFAS) are persistent chemicals with suspected endocrine disrupting abilities applied in consumer products. PFAS have been reported to inhibit 11β-HSD1 and 11β-HSD2, which could lead to reduced levels of cortisol and cortisone.

Aim: To investigate a possible effect of early pregnancy PFAS exposure on late pregnancy activity of 11β-HSD1 and 11β-HSD2 assessed by cortisol and cortisone levels in urine and blood samples.

Methods: The study is part of the prospective cohort study, Odense Child Cohort (OCC). A total of 1,826 pregnant women had serum (S) concentrations of five PFAS (Perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), and perfluorodecanoic acid (PFDA)) measured in first trimester (median gestational week (GW) 11). Diurnal urinary (dU) cortisol and cortisone (n=344), and S-cortisol (n=1,048) were measured in third trimester (median GW 27).

Results: In multiple regression analyses, a two-fold increase in S-PFOS was significantly associated with lower dU-cortisone (β=-9.1%, p<0.05) and higher dU-cortisol/dU-cortisone (dU-C/C) (β=9.3%, p<0.05). The same trend was demonstrated for PFOA, PFHxS, PFNA, and PFDA. In crude models, a doubling in PFOS, PFOA, PFHxS, and PFNA concentrations were associated with a significant increase in S-cortisol, however, these associations became insignificant after adjustment.

Conclusion: Early pregnancy concentrations of maternal S-PFAS were inversely associated with late pregnancy dU-cortisone, indicating reduced activity of 11β-HSD2.

Thyroid
THYROID NEOPLASIA AND CANCER
Thyroid Nodules > 4cm: High-Risk for Malignancy or Not?
Heather Fishel, MD1, Ambika Rao, MD2.
1USC/Palmetto Health Richland, Columbia, SC, USA, 2Dorn VA/USC, Columbia, SC, USA.

MON-LB78
Background: Thyroid nodules are very common in adults. One percent of men and 5% of women have nodules on exam, and 19-68% of adults have thyroid nodules on ultrasound. Majority (85-90%) of them are benign. Most concerning is the diagnosis of thyroid cancer. These nodules can be stratified into risk groups based on ultrasonographical criteria. There are 5 internationally endorsed sonographic classification systems (ATA, ACR, European Thyroid Association and Korean Society of Thyroid Radiology). After classification, decision to perform FNA biopsy is made based on size of the nodules. Some of the other parameters that have been considered to increase risk of cancer are BMI, TSH level, radiation exposure to the neck before puberty and family history of thyroid cancer. Cytogenetic testing of the FNA specimen may also help determine the need for excision.

Study Design: We retrospectively studied a group of veterans referred for endocrine consultation for thyroid nodules that had undergone FNA based on ACR and ATA ultrasonographical classification (total of 127 nodules). On reviewing these charts over the past 4 years, we noted that approximately 39% (49/127) of the nodules were <2cm, 35% (44/127) were 2-4cm and 26% (34/127) were >4cm in size. We examined patient demographics and characteristics of nodules >4cm, since it is frequently a dilemma whether to clinically monitor these nodules or refer them for surgical excision.

Results: Seventeen percent of patients were females. Majority were between 60-65 years of age, had a BMI 30-35 and TSH of <2. Based on review of ultrasound images and
The patient’s morning testosterone level showed 8 ng/dL (normal = 193.0 - 731.0 ng/dL), follicle-stimulating hormone 0.35 µIU/mL (normal, 0.0-10.0), and luteinizing hormone 0.4 µIU/mL (normal = 86 - 324 µIU/L). There were no symptoms suggestive of posterior pituitary involvement like polyuria and polydipsia as urine and serum osmolality. The MRI examination showed no pituitary gland identified in the sella turcica and no clear pituitary stalk. A T1 hyperintense focus with post-contrast enhancement was identified posterior to the optic chiasma representing an ectopic posterior pituitary gland. The growth hormone and testosterone therapy were added to medical therapy of the patients and no thyroid or hydrocortisone replacement therapy was given.

Discussion: It is unclear if the risk of thyroid cancer in nodules >4cm is any different from that of smaller nodules and if there should be different criteria used in nodules >4cm for risk stratification. Other questions to address are how these nodules should be monitored for growth and what criteria should be used to determine need for surgical intervention, other than FNA results or compression symptoms. Recent studies looking at growth of thyroid nodules over time do not indicate clear predictors for malignancy. Further studies are needed.

**Reproductive Endocrinology**

**CLINICAL STUDIES IN FEMALE REPRODUCTION II**

**Undescended Testicle and Short Stature as Manifestation of Pituitary Stalk Interruption Syndrome a Report From Saudi Arabia**

Rania Ahmed, MD, Asirvatham Alwin Robert, PhD.
Prince Sultan Military Medical City, Riyadh, Saudi Arabia.

**SUN-LB2**

Background
Pituitary stalk interruption syndrome (PSIS) is a congenital disease with isolated growth hormone deficiency or multiple anterior pituitary hormone deficiencies. Here, the authors report a case of PSIS from Saudi Arabia.

Clinical Case
A 16 year old Saudi boy presented to the endocrine clinic with short stature and undescended testis, status post bilateral orchiopexy. He was delivered by caesarean section because of breech presentation and birth asphyxia. Investigation revealed underdeveloped secondary sexual characteristics with decreased facial and pubic hair growth. The patient height was 134 cm whereas the bone age was 9 - 11 years. Pelvis examination showed a scrotum with bilateral 1 mL testes and the stretch penile length was 3 cm. The patient’s morning testosterone level showed 8 ng/dL (normal = 280-800 ng/dL) and prolactin 116 mIU/L (normal = 86 - 324 mIU/L). There were no symptoms suggestive of posterior pituitary involvement like polyuria and polydipsia as urine and serum osmolality. The MRI examination showed no pituitary gland identified in the sella turcica and no clear pituitary stalk. A T1 hyperintense focus with post-contrast enhancement was identified posterior to the optic chiasma representing an ectopic posterior pituitary gland. The growth hormone and testosterone therapy were added to medical therapy of the patients and no thyroid or hydrocortisone replacement therapy was given.

Conclusion: Despite the fact that this is a rare disorder, it should always be kept in the differential diagnosis of a patient presenting with short stature. Patients with this disease have an excellent opportunity to reach normal height if they present before the joining of epiphyses.

**Reproductive Endocrinology**

**MALE REPRODUCTIVE HEALTH - FROM HORMONES TO GAMETES**

**Anti-Cancer Properties of RISUG Against Prostate Cancer Cell Line PC-3 - In-vitro Study**

Pankaj Singroul, B.Tech. 1, Pulak Singh, MSc2, Sujoy K. Guha, MS, PhD3, Surabhi Gupta, MSc, PhD3, Pradeep Kumar Chaturvedi, MSc, PhD3.

1National Institute of Technology Warangal, Warangal, India, 2All India Institute of Medical Sciences, New Delhi, India.

**SAT-LB9**

**Title:** Anti-cancer properties of RISUG against prostate cancer cell line (PC3) - invitro study

**Abstract**
Cancer cell lines were initially established for understanding the genetic, functional, and epigenetic properties of cancer cells. The PC3 cell line is a human-derived prostate cancer cell line from the metastatic bone site of the grade IV adenocarcinoma patient. With the invention of RISUG-a polymeric male contraceptive, and studying its anti-cancerous effect based on its physical and chemical nature[1]. This study focuses on understanding the effect of RISUG on prostate cancer cell line PC3 via MTT assay. For our study, 10 mg/ml working concentration of RISUG in DMSO (solvent) was used for the treatment to the cells. The dosage given to the cells for three varying incubation periods of 24 hours, 48 hours and 72 hours were analyzed for the viable cells post treatment. The dose was delivered with the media such that the final concentration of DMSO in the media is 1.5% (optimized) to avoid vehicle toxicity. The MTT assay was employed to study the cytotoxicity effect by measuring the amount of viable cells post treatment. The observations were statistically significant for the anticancerous effect of RISUG on PC3 prostate cancer cells for 72 hours, the optimized minimum incubation time/time of action for RISUG to exhibit significant anti-cancer effect against PC3 cells. However, further in depth research is necessary for the understanding of the mechanism behind these actions.