was complicated due to hyperglycemia in 300s-400mg/dL requiring high amounts of insulin. Diabetes work up was negative for GAd-65 and islet cell antibodies. C-peptide was elevated at 16.1 ng/mL (0.8-3.1 ng/mL) and anti-Insulin an antibodies was 20uU/mL. Patient was euthyroid. Hyperglycemia persisted despite increasing doses of long and short acting insulin subcutaneously. The patient eventually required Insulin intravenously at 50 units/hour plus 50 units of short acting Insulin every 4 hours subcutaneously. The patient was transferred to a facility to begin Combined Immunosuppressive Therapy plus insulin to manage hyperglycemia due to insulin resistance. After six months of rituximab, high-dose pulsed steroids, cyclophosphamide, plus insulin therapy, glycemic index improved with HbA1c reduced to 5.6%. **Conclusion:** Combined Immunosuppressive Therapy in addition to insulin management of refractory hyperglycemia due to type B insulin resistance has been shown to not only be effective in controlling refractory hyperglycemia but preventing against recurrences as well. **Reference**: 1) Klubo-Gwiezdzinska J, Lange M, Cochran E, Semple RK, Gewert C, Brown RJ, Gorden P. Combined Immunosuppressive Therapy Induces Remission in Patients With Severe Type B Insulin Resistance: A Prospective Cohort Study. Diabetes Care. 2018 Nov;41(11):2353-2360.

Thyroid

THYROID DISORDERS CASE REPORTS II

Hashimoto's Glomerulonephritis: A Reality or Just a Coincidence?

ANDRES ALBERTO GOMEZ NORONHA, MD,
ISABEL PULGAR SEDÓ, MD.
HOSPITAL NACIONAL ALBERTO SABOGAL SOLOGUREN, LIMA, Peru.

SAT-466

Background: Glomerulonephritis is a common health problem surrounding nephrologists, mainly characterized by nephrotic range proteinuria, low serum albumin level and edema. There are several causes such as infections, cancer or autoinmune disorders, like Hashimoto's thyroiditis. This is a chronic inflammation of the thyroid gland caused by high serum thyroid autoantibodies leading to hypothyroidsm. In the last years, many authors worldwide have found an uncommon association between Hashimoto's disease and nephrotic syndrome. This may be attributed to cross-reacting antigens, such as thyroglublin, that become deposited in the glomeruli. **Clinical Case:** A 40-year women was admitted to our hospital with typical symptoms of nephrotic syndrome. The patient has a history of hypothyroidsm two years ago, treated with levothyroxine 200 mcg. Initial tests were congruent with glomerular impairment: low serum albumin 2.8 g/dl (NR > 3.5 g/l), hypercholesterolemia 300 mg/dl, (NR <200 mg/dl) and nephrotic-range proteinuria (9g/24h). Viral infections such as HIV, hepatitis B and C, herpes virus and rubella were discarded. Moreover, autoantibodies such as ANA, ANCAc and ANCAp were studied with no contributory results. Tumor markers were also tested and a complete body CT scan was performed looking for some occult cancer, but nothing contributory was found. Thyroid hormones levels were out of range (TSH: 20.04 mIU/l, NR: 0.27-4.20 mIU/l; FT4: 5 pmol/L, NR: 12-22 pmol/L). ATPO and ATG were performed, which were positive and in several fold higher levels than expected. (ATPO: >600 U/ml, N<34 U/ml; ATG: 195 U/ml, N <115 U/ml)

During hospitalization a kidney biopsy was performed. The anatomic pathology report was compatible to membranous glomerulonephritis. Since there was no clear etiology of the nephrotic syndrome, we assumed that Hashimoto's disease had an important role in this particular case, having already discarded the most common causes. We decided to optimized levothyroxine dose (from 200 mcg qd to 250 mcg qd) and ACE inhibitors (losartan 50 mg qd) were added to the therapeutic plan. During the follow up (one year later), we observed an improvement in thyroid hormone levels (TSH: 0.94 mIU/l, FT4: 14.17 pmol/L) and a decreased in proteinuria (3g/24h); however, ATPO and ATG levels persisted high (ATPO: >600. ATG: 170.6). No immunosuppressive therapy was used at all. **Conclusion:** This is the first case in our hospital demonstrating the possible association between Hashimoto's disease and membranous glomerulonephritis. Santoro et al. strongly believe that there is a trully relationship connecting both entities, suggesting that similar imnunological abnormalities ought to be the key point in the pathogenesis of the two conditions. **Reference:** (1) Santoro, D., Vadalà, C., Siligato, R., Buemi, M., & Benvenga, S. Autoimmune thyroiditis and glomerulopathies. *Frontiers in endocrinology*, *8*, 119. (2017)

Neuroendocrinology and Pituitary

HYPOTHALAMIC-PITUITARY DEVELOPMENT AND FUNCTION

Evidence That Combined Pituitary Hormone Deficiency Frequently Has a Digenic/Oligogenic Etiology

Youn Hee Jee, MD[1], Mariam Gangat, MD[2], Olga Yeliosof, MD[3], Adrian Temnycky, Mr[1], Selena Vanapruks, Ms[1], Evgenia Gourgari, MD[4], Jack Adam Yanovski, MD, PHD[5], Kathleen Link, MD[6], Svetlana B. Ten, MD[7], Jeffrey Baron, MD[1], Sally Radovick, MD[8].
[1]NIH, Bethesda, MD, USA, [2]UMDNJ, Scotch Plains, NJ, USA, [3]Robert Wood Johnson Rutgers, Staten Island, NY, USA, [4]Georgetown Univ, Rockville, MD, USA, [5]NICHD/NIH, Bethesda, MD, USA, [6]Pediatric Subspecialists of Virginia, Vienna, VA, USA, [7]Ten's Medical PC, Staten Island, NY, USA, [8]Robert Wood Johnson Medical School, New Brunswick, NJ, USA.

SAT-289

Congenital hypopituitarism usually occurs in a child without a family history of pituitary disease. Explanations for such sporadic occurrence include: 1) monogenic inheritance (recessive or de novo), 2) digenic/oligogenic inheritance, and/or 3) nongenetic factors. To help distinguish these possibilities, we studied 9 children with hypopituitarism (HP)(small anterior pituitary gland, ectopic posterior pituitary, and either isolated GH deficiency (n=1) or combined with other pituitary hormone deficiencies(n=8)), with non-consanguineous parents and no family history of pituitary disease. SNP array analyses confirmed paternity and non-consanguinity and excluded significant copy-number variation. Exome sequencing was performed in

probands and parents. Candidate variants (coverage >10, confirmed by examining BAM files, population frequency <1%, <2 homozygous subjects in gnomAD, and pathogenic prediction by at least 2 out of 3 prediction algorithms (SIFT, MutationTaster, PolyPhen2)) were identified. Children with non-familial non-endocrine idiopathic short stature (ISS) (n=19, sequenced at the same laboratory followed by simultaneous data processing with HP patients), served as a control group. To assess the frequency of genetic (mono-, di-, or oligogenic) HP cases, we identified heterozygous variants (regardless of inheritance) in 42 genes previously reported to be associated with pituitary development. The average number of variants per proband was greater in HP than in ISS (1.1 *vs* 0.26, $P = 0.04$). Similarly, the number of probands with at least 1 variant in a pituitary-associated gene was greater in HP than in ISS (67% vs 21%, $P = 0.035$). These data suggest that sporadic hypopituitarism is frequently genetic. To assess the number of monogenic cases, we counted the number of candidate variants (in any gene in the genome, to capture undiscovered causes) that were inherited in a fashion that could explain the sporadic occurrence with a monogenic etiology (*de novo* mutation, autosomal recessive, X-linked recessive). There were fewer monogenic candidates in subjects with HP than ISS (1.6 vs 2.6 candidates/proband, $P = 0.03$). These data are consistent with approximately 1.6 non-causative variants/proband in both groups plus approximately 1 causative monogenic variant in ISS *vs* approximately 0 causative monogenic variants in HP. Candidate variants in genes previously reported to explain the phenotype were identified in 0 out of 9 trios with HP and in 8 of 19 trios with ISS (42%). These findings suggest that a monogenic inheritance is less common in HP than in ISS. In conclusion, the findings suggest that sporadic congenital hypopituitarism is frequently genetic but infrequently monogenic, implying a likely digenic/oligogenic etiology.

Thyroid

THYROID CANCER CASE REPORTS I

Primary Hyperparathyroidism and Papillary Thyroid Carcinoma, Association or Coincidence?

Nitish Singh Nandu, MD[1], Janice L. Gilden, MD,BA,MS[2].
[1]CHICAGO MEDICAL SCHOOL AT ROSALIND FRANKLIN UNIVERSITY OF MEDICINE AND SCIENCE, North Chicago, IL, USA, [2]RFUMS/Chicago Med School & AMITA St Mary's Medical center, North Chicago, IL, USA.

SUN-473

Background: The Parathyroid glands originate from the Pharyngeal pouches, Inferior from the third and superior from the fourth. Rarely these glands migrate to the thyroid gland, isthmus or thymus and become ectopic. Primary Hyperparathyroidism (PHPT) is a common cause of hypercalcemia in ambulatory patients. It is also more frequent in women and increases with age. Its treatment is often surgical removal of the affected parathyroid gland. We present a case of an ectopic parathyroid adenoma hidden within the thyroid lobe, treated by thyroid lobectomy ultimately leading to the diagnosis and management of Papillary thyroid carcinoma. **Case report:** A 73-Year-old female with DM, HTN, hyperlipidemia, osteoporosis was referred to the Endocrine clinic for a history of fractures to the right upper and lower extremities after trivial falls, She was subsequently evaluated for metabolic bone disease, noted to have a PTH 78 (n=14-64 pg/ml) with a total serum calcium 9.7 (n=8.6-10.4 mg/dl), 25-OH Vit-D 14 (n=30-100 ng/ml), urinary calcium to creatinine ratio 20 (n=10-320 mg/g). The parathyroid scan showed persistent activity in the area of the inferior margin right thyroid lobe, suggesting a parathyroid adenoma. She had a parathyroidectomy and during the procedure, the parathyroid gland was unable to be visualized. Hence the Right inferior thyroid lobe was removed. The pathology also showed papillary thyroid carcinoma and the patient had a total thyroidectomy. **Discussion:** The relationship between PHPT and Papillary thyroid carcinoma still remains unclear. Our patient demonstrated a rare circumstance, wherein the presence of a parathyroid adenoma within the thyroid gland has led to early diagnosis and timely treatment of papillary thyroid carcinoma. Few authors reported thyroid malignancy as the most prevalent cancer among patients with PHPT as the primary disorder. While others report concurrence as a coincidental pathology. Nevertheless, we emphasize the importance of surveillance for thyroid pathology in patients with PHPT that can provide better overall patient outcomes.

References: 1. Vargas-Ortega, G., et al. (2018). "Symptomatic Primary Hyperparathyroidism as a Risk Factor for Differentiated Thyroid Cancer %J Journal of Thyroid Research." 2018: 6. 2. Miccoli, P., et al. (2006). "Incidental thyroid carcinoma in a large series of consecutive patients operated on for benign thyroid disease." ANZ J Surg 76(3): 123-126. 3. Bentrem, D. J., et al. (2002). "Is preoperative investigation of the thyroid justified in patients undergoing parathyroidectomy for hyperparathyroidism?" Thyroid 12(12): 1109-1112.

Reproductive Endocrinology

CLINICAL STUDIES IN FEMALE REPRODUCTION II

Efficacy of High Intensity Intermittent Training for Improving Cardio-Metabolic Health in Women with Polycystic Ovary Syndrome: A Pilot Study

Rhiannon Kate Patten, MSc, Luke McIlvenna, MSc, Alba Moreno-Asso, PhD, Nigel NIGEL Stepto, PhD, Danielle Hiam, PhD.
Victoria University, Melbourne, Australia.

SUN-010

Efficacy of HIIT for Improving Cardio-metabolic Health in Women with Polycystic Ovary Syndrome: a Pilot Study
Polycystic ovary syndrome (PCOS) is a common and complex endocrinopathy with reproductive and metabolic manifestations, carrying a major health and economic burden. Exercise training has consistently been found improve clinical outcomes in women with PCOS, but shortfalls with exercise prescription are evident. Research suggests that high intensity intermittent exercise (HIIT) is feasible, well tolerated and enjoyable for people with or at risk of chronic disease and can address many of the shortfalls and barriers to exercise participation. To investigate the effects of high intensity exercise, twenty-four reproductive aged,