multiple organs. PHA type 2 (Gordon syndrome) presents with hyperkalemia and hypertension. Case: Our patient is a 5 week old male who admitted for significant electrolyte abnormalities. He was followed by PCP for failure to thrive. The child was referred to ED with increased difficulty in feeding, lethargy and episodes of emesis. In the ED, the child was in a compensated shock and had a low normal BP: 76/35, HR: 169/min and fast breathing R/R: 80/minute and afibrile. P.E. showed signs of dehydration. Lab work showed: Na: 110 mEq/L, K: 9.3 mEq/L, low Chloride and Ca: 11.1 mEq/L. Endocrinology recommended IVF supplementation with 2 x NS bolus followed by IVF’s at 1.5 times maintenance (D5 + NS), along with administration of Florinef 0.2 mg suspecting CAH. Renin, 17-OHP, normal cortisol level and thyroid hormone levels were ordered. Results showed: TSH of 5.30 mcIU/mL and Free T4 of 2.2 ng/dL. Cortisol: 20.5 mcg/dL. He was subsequently admitted to PICU. Septic work-up was negative. He became hemodynamically stable after hydration and did not require stress dose of hydrocortisone. Repeat Ne: 133 mEq/L, K: 4.7 mEq/L, Cl: 102 mEq/L and Glucose: 90 mg/dL. A diagnosis of PHA was made and Florinef was stopped and the child was started on NaCl supplementation which normalized the electrolytes. Genotype testing was negative for NR3C2, CUL3, KLHL3, SCNN1A, SCNN1B, SCNN1G, WNK4 and showed that the patient is a heterozygous for a variant of unknown significance, c.6276T>A (p.Ser2092Arg) in the WNK1 gene. However, the patient did not have hypertension and urine electrolytes were also normal did not show signs of PHA 2. Conclusion: PHA can present with severe salt wasting crisis. It can be diagnosed clinically. The relationship of mutation and phenotype can be elusive. Course was uncomplicated and he was discharged from the PICU in 6 days. Sodium doses were titrated based on serum levels with eventual dose of 22.5 mEq/kg/day and sodium level was 139 mEq/L.

Bone and Mineral Metabolism
NEW INSIGHTS INTO PTH AND CALCIUM RECEPTOR SIGNALING

Is Urinary Calcium the Only Predictor of Nephrolithiasis in Patients with Asymptomatic Primary Hyperparathyroidism?
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OR07-05
The 4th International Workshop for the management of asymptomatic PHPT included, among the criteria for parathyroidectomy, the presence of hypercalciuria (dUCa> 400 mg/day) and increased biochemical stone risk profile. The aim of the present study was to evaluate the biochemical stone risk profile in 176 consecutive patients (143 females and 33 males) with asymptomatic PHPT. We recorded clinical and biochemical data, including 24 hours urinary measurements of the following parameters: volume and pH, creatinine, calcium, magnesium, sodium, potassium, ammonium, uric acid, oxalate, citrate, phosphate, inorganic sulphate and chloride and kidney ultrasound. In our cohort dUCa> 400mg/day showed a low sensitivity and positive predictive value (PPV) for nephrolithiasis with high specificity (46.2, 32.7, 73.0% respectively), while hypercalciuria by 4 mg/kg/bw (d-UCa>4mg/kg) had a high sensibility, with low PPV and specificity (79.5, 27.7, 40.1%) Daily hypomagnesuria (d-HypoMg), but not any other urinary parameter, was an independent predictor of nephrolithiasis in the univariate (OR 2.97 CI 1.27-7.09 P=0.014) and multivariate analyses adjusting for age, sex, BMI, and eGFR (OR 3.13 CI 1.17-8.42 P=0.02). d-HypoMg was relatively lower in the regression analysis with urinary calcium in patients with nephrolithiasis compared with those without. The mean ratio between (dUCa) and (dUMg) was higher in patients with nephrolithiasis compared with those without (4.6±2.0 vs 3.3±4.1; P<0.001). In the univariate and multivariate analyses the dUCa/dUMg ratio was a significant predictor of nephrolithiasis [OR 4.9 (2.3-10.5); P<0.001; OR 5.3 (2.4-11.6), P<0.001, respectively]. The AUC using the dUCa/dUMg ratio as variables was 0.69 (CI 0.60-0.79; P<0.0001). The best cut-off value, set at the highest Youden index, was equal to 4.0, with a sensitivity of 59.0% and a specificity of 77.4%.

In patients with hypercalciuria (>400 mg/24-hour) dUMg was positively correlated with dUCa in those without nephrolithiasis (r=0.50, β=0.2, P=0.002) but not in those with nephrolithiasis (r=0.05, β= 0.014; P=0.8). In patients without hypercalciuria we found that hypomagnesuria remained a predictor of nephrolithiasis using either 400 mg/die (P=0.002, OR 5.12 (1.84-14.24) or 4 mg/kg bw (P=0.014, OR 6.24 (1.45-26.8). Moreover, the OR for nephrolithiasis improved using the combination of d-HypoMg with d-UCa>4mg/kg (OR 8.12, CI 1.92-34.18, P=0.004), but not with dUCa> 400mg/day.

The current urinary calcium threshold of >400 mg/24-hour has a low sensitivity in detecting nephrolithiasis; our data suggest that sensitivity, specificity and positive predictive value could be improved including dUMg, dUCa/dUMg ratio and the combination of d-HypoMg with d-UCa>4mg/kg in the stone risk evaluation.

Diabetes Mellitus and Glucose Metabolism
TYPE 2 DIABETES MELLITUS

Does Short Term Intensive Insulin Therapy in Newly Diagnosed Type 2 Diabetes Mellitus Delay Eventual Insulin Dependence
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SUN-681
In patients with type 2 diabetes mellitus (T2DM), dysfunction of β-cells starts years before the diagnosis of T2DM and rapidly worsens after overt hyperglycemia. Use of short-term intensive insulin therapy (STIIT) at the time of diagnosis of overt hyperglycemia has shown clinical recovery
of β-cells for up to 2 years. A systematic literature review of studies looking for the effect of STIIT, used within two years of diagnosis of T2DM, on the duration from relapse of hyperglycemia to eventual insulin dependence is presented in this abstract.

The key phrases ‘type 2 diabetes mellitus’, ‘short-term insulin therapy’, ‘β-cell failure’, and ‘permanent insulin dependence’ were used to search English literature. For simplicity the duration of diabetes in these studies was divided into three periods: Period 1- Diagnosis of T2DM to initiation of STIIT, Period 2- End of STIIT until relapse of hyperglycemia i.e. total glycemic remission period, and Period 3- Relapse of hyperglycemia to permanent dependence on insulin therapy. Studies were excluded if all of their participants had diagnosis of T2DM for more than 2 years at the time of inclusion, i.e., if period 1 was more than 2 years.

Six clinical trials involving STIIT were identified (Period 2). No studies that examined the clinical course of T2DM in their patients beyond the relapse of hyperglycemia (Period 3) were identified.

This literature review identified a lack of data about this important clinical question- do ‘recovered’ β-cells from STIIT exhibit a better response to non-insulin therapies after the end of period 2 and, hence, delay the secondary β-cell failure in period 3? There is a need to conduct studies with longer follow up to characterize the differences in the disease course between patients treated with STIIT and patients treated with non-insulin therapies. This can help us understand scope of STIIT beyond the initial functional remission of β-cells.

Thyroid

THYROID NEOPLASIA AND CANCER

Quantitative Analysis of Differential Enigma/ PDLIM7 Gene Expression in Thyroid Cancer vs. Benign Nodules

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MON-516

Thyroid cancer incidence is rising worldwide. Although fine-needle aspiration biopsy (FNAB) is an accurate modality for evaluating thyroid nodules, up to 25% of FNABs still yield indeterminate results. There is a considerable number of diagnostic thyroidectomies for benign disease as a result of indeterminate FNAB. A more accurate and time-efficient diagnostic approach for analyzing indeterminate thyroid nodules may reduce diagnostic thyroidectomy. Recently, the osteogenic protein, Enigma, has been associated with different cancer types, including thyroid cancer progression and calcification through its interaction with bone morphogenic protein-1 (BMP-1), and tyrosine kinases linked to mitogenic signaling pathways [1, 2]. Our published data on Enigma protein analysis with immunohistochemistry showed promising results in discriminating between malignant versus benign thyroid nodules and demonstrated a correlation with thyroid cancer staging [3]. In this study, we are investigating Enigma at a gene expression level by real-time (RT-qPCR), which is a quantitative and more time-efficient method that requires smaller samples (FNA) than immunohistochemistry. We analyzed Enigma mRNA expression levels to determine if Enigma-qPCR could be used as a diagnostic tool to improve the accuracy of FNAB in both malignant and benign thyroid tissues. We extracted mRNA/DNA/proteins from fresh malignant and benign thyroid nodules using a QIAGEN DNA/RNA/Protein Kit. We ran isolated pure mRNA through Enigma-qPCR. The results showed that the Enigma-mRNA expression was 3-fold higher in malignant as compared to benign thyroid tissues. This finding supports our previous Enigma immunohistochemistry data and shows a relative quantitative difference in Enigma-mRNA expression level between malignant and benign thyroid nodules. We conclude that Enigma-RT-qPCR can be used to effectively determine malignancies in FNAB samples derived from thyroid nodules. This method could potentially enhance the diagnostic accuracy of indeterminate nodules and decrease diagnostic thyroidectomies and associated morbidity.

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Bone and Mineral Metabolism

BONE AND MINERAL CASE REPORTS II

Head to Toe Hyperparathyroidism - Impending Hyperparathyroid Crisis and Subsequent Crystal Arthropathies

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MON-376

The myriad of presentations associated with PHP are well established, however gout is not commonly associated with this disease. Additionally, it is unusual to see multiple threatening and potentially debilitating complications occur concurrently in one patient. An asymptomatic elderly male with hypertension presented to the PCP for the first time and was found on routine blood work to have a serum creatinine of 4.03 mg/dl, a serum calcium of 12.1mg/dl, and a PTH of 831.7ng/L. Subsequent Tc-99 Sestamibi scanning suggested that the source was both a single right inferior parathyroid adenoma and an ectopic mediastinal adenoma. At the initial encounter the patient’s hypercalcemia was treated with IV fluid resuscitation and calciitonin then subsequently cinacalcet. Renal ultrasound at that time showed normal sized kidneys with several cysts, and phosphate levels ranged from 2.0-3.9 mg/dl (range 2.5-4.5mg/dl. The patient’s serum calcium was...