combination CTLA-4/PD-1 inhibitors, 43.8% (7/16) PD-1 monotherapy, 6.25% (1/16) CTLA-4 monotherapy, and 6.25% (1/16) PD-L1 monotherapy. Forty-six percent (6/13) of group H had radiographic evidence of hypophysitis on MRI that resolved on follow up imaging. Six patients had concurrent thyroiditis, 2/16 had concurrent type 1 diabetes, 9/16 had central hypothyroidism, 1/16 had secondary hypogonadism, and 2/16 had GH deficiency. In 15/16 patients, secondary AI presented as the first endocrinopathy, while one patient presented with central hypothyroidism.
Conclusions: Development of hypophysitis following ICI therapy was associated with a longer survival. Deficiencies in multiple pituitary hormones occurred in the majority and non-pituitary endocrinopathies occurred in half the cases. High dose steroid usage can also present as secondary AI, making the diagnosis of ICI induced hypophysitis difficult. Further pituitary evaluation must be conducted to differentiate secondary AI due to exogenous steroids from hypophysitis from ICI therapy.

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Copeptin Levels Before and After Transsphenoidal Surgery for Cushing Disease: A Potential Marker of Remission

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Objectives: Chronic hypercortisolemia suppresses AVP secretion. Copeptin makes up the C-terminal portion of the AVP precursor pre-pro-AVP, is released in stoichiometric amounts with AVP, and is a stable surrogate marker of AVP.A post-operative increase in plasma copeptin was hypothesized to be a marker of remission of Cushing Disease (CD).
Methods: Plasma copeptin was obtained in patients with CD before and daily in the first week after transsphenoidal surgery (TSS), measured using the Brahm Kryptor Compact PLUS sandwich immunofluorescent assay. Urine output, serum sodium, urine specific gravity, and urine/serum osmolality were used to determine development of central diabetes insipidus (DI) and/or syndrome of inappropriate anti-diuretic hormone secretion (SIADH). Change in copeptin reflects pre-TSS to peak post-TSS copeptin levels. Statistical analyses were completed using non-parametric tests. Results are presented as median (inter-quartile range).
Results: Forty-four patients (64% female, 7-55 years old) were included. After TSS, 8 (18%) developed DI, 13 (30%) developed SIADH, 4 (9%) developed both DI and SIADH, and 19 (43%) developed neither. Thirty-three patients had a follow-up at 3-6 months. Overall, there was no difference in peak post-TSS copeptin for patients in remission versus those not in remission [6.1 pmol/L (4.3-12.1) vs. 7.3 pmol/L (5.4-8.4), p=0.88]. There was, also, no difference in the copeptin change for those in remission versus not in remission [2.3 pmol/L (-0.5-8.2) vs. 0.1 pmol/L (-0.1-2.2), p=0.46]. When we excluded patients who developed a water balance disorder postoperatively, there was a difference in peak post-TSS copeptin for those in remission [10.2 pmol/L (6.9-21.0)] vs. those not in remission [5.4 pmol/L (4.6-7.3), p=0.032], but not in the change in copeptin for those in remission vs. not in remission [5.1 pmol/L (0.3-19.5) vs. 1.1 pmol/L (-0.1-2.2), p=0.39].
Conclusions: Post-TSS plasma copeptin may be a useful early marker to predict remission of CD after TSS. However, the utility of this test may be limited to those who do not develop water balance disorders post-operatively. Additional studies with larger sample sizes are needed to confirm these findings and to determine a post-operative plasma copeptin cutoff level that may predict remission of CD.

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Dehydroepiandrosterone Sulfate, Cortisol and Adrenocorticotropic Hormone Levels in Drug-Naive, First Episode, Male and Female Patients With Psychosis

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Introduction: Impaired response to stress and a pathological activation of the hypothalamic-pituitary-adrenal axis have been implicated in the pathophysiology of schizophrenia. We aimed to measure serum dehydroepiandrosterone sulfate (DHEA-S), cortisol and adrenocorticotropic hormone (ACTH) levels in drug-naïve, first episode patients with psychosis followed-up in a Greek tertiary center. **Methods:** Data were included from drug-naïve, first episode patients with psychosis and controls matched for age and sex. Serum DHEA-S, cortisol and ACTH levels were recorded. Results are reported as mean (standard deviation, range). Paired t-test or Wilcoxon signed rank test were performed for group comparisons. The level of significance was set at p less than 0.05. Statistical analysis was performed with Stata 15.1. **Results:** Data were included for 110 subjects (70 men, 40 women); 55 patients and 55 controls. Mean age was 31.3 years (8.7, 18.0-48.0) in patients and 31.4 years (8.9, 17.0-49.0) in controls. Serum DHEA-S was higher in patients [306.5 μg/dl (165.4, 70.0-790.0)] compared to controls [240.1 μg/dl (113.5, 46.0-597.0)] (p=0.011). Serum ACTH was similar between patients and controls [28.5 pg/ml (15.7, 6.2-73.9) versus 26.5 pg/ml (15.3, 7.0-70.5), p=0.636]. Serum cortisol levels and

cortisol/DHEA-S ratio were statistically lower in patients [12.6 µg/dl (4.5, 3.5-24.5) and 5.3 (3.6, 1.3-19.5), respectively] compared to controls [15.5 µg/dl (4.9, 4.2-30.1) and 8.0 (4.7, 1.1-25.5), respectively] (p=0.007 and 0.001, respectively). Sub-analysis, revealed that in men, serum DHEA-S was similar between patients and controls [303.7 µg/dl (149.0, 85.0-744.0) versus 275.0 µg/dl (117.4, 89.0-597.0), respectively, p=0.271) whereas in women serum DHEA-S was higher in patients compared to controls [311.4 µg/dl (194.8, 70.0-790.0) versus 179.2 µg/dl (75.9, 46.0-314.0), respectively, p=0.005]. Serum cortisol and ACTH levels were not different in the above subgroups except serum cortisol in men which was lower in patients compared to controls [12.8 µg/dl (4.4, 3.5-21.6) and 15.9 µg/dl (5.4, 4.2-30.1), respectively, p=0.027]. **Conclusions:** Serum DHEA-S levels were higher in drug-naïve, first episode female patients, with psychosis compared to controls. DHEA-S levels in male patients and controls were similar.

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Diagnostic Threshold for Postoperative Secondary Adrenal Insufficiency After Transsphenoidal Resection of Pituitary Adenomas

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Transsphenoidal surgery (TSS) is the first line treatment for pituitary adenomas. A well-known complication of TSS is secondary adrenal insufficiency with a reported risk of 4-9% after TSS. Currently, glucocorticoid replacement is recommended if postoperative AM cortisol is < 3 ug/dL. Postoperative adrenal insufficiency is ruled out if AM cortisol is > 15 ug/dL. However, further evaluation of the adrenal axis with ACTH stimulation test is recommended for intermediate cortisol levels 3-15 ug/dL. Other studies have proposed postoperative cortisol threshold of < 4-14 ug/dL for glucocorticoid replacement. Retrospective analysis of all patients undergoing TSS at a tertiary center from January 2013 through April 2016 was performed. ACTH producing adenomas (Cushing's disease) were excluded. Of the 97 patients included, 17.5% (n=17) had secondary adrenal insufficiency requiring glucocorticoid replacement at 1 year post operatively. Mean age at presentation was 56 ± 16 years and 52% were female. Mean adenoma size was 25.3 ± 11.3 mm. Factors associated with adrenal insufficiency at 1 year post operatively were preoperative secondary adrenal insufficiency (AM cortisol 4.5 ± 1.9 vs 11.0 ± 1.0 µg/dL; $p = 0.03$), and preoperative adenoma contact with optic chiasm (15.7% vs 2.1%; $p = 0.01$). Day 1-7 postoperative cortisol was lower in the group with adrenal insufficiency at 1 year (5.6 µg/dL (IQR 1.9-11.5) vs 19.8 µg/dL (IQR 12.75-43.2); p=0.02). Age, gender, adenoma size, and cavernous sinus involvement were not associated with adrenal insufficiency at 1 year. A day 1-7 postoperative cortisol concentration of ≥8.0 µg/dL had a sensitivity of 75% and specificity of 92% in predicting adrenal insufficiency at 1 year. In patients with secondary adrenal insufficiency at 1 year (n=17), there was a higher frequency of concomitant loss of other pituitary hormone function at 1 year: secondary hypothyroidism 82% (n=14), secondary hypogonadism 70.6% (n=12) and diabetes insipidus 17.7% (n=3). A lower postoperative cortisol threshold of 8 µg/dL can be adopted for glucocorticoid replacement on discharge after TSS.

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Drug Induced Hyperprolactinemia

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Introduction: Drugs are a common cause of hyperprolactinemia. It is essential to differentiate this cause from other pathological causes which avoids unnecessary investigations. Detailed history will help us in identifying the responsible drug and withdrawing the same will be rewarding. Here we are reporting a case series of drug induced hyperprolactinemia. **Methods:** It was a cross-sectional observational study. Subjects were recruited from our outpatient department. Hyperprolactinemia was defined as blood prolactin levels >30 ng/mL in females and >24 ng/mL in males, regardless of the presence of symptoms. Serum prolactin was repeated one week after holding the suspected drug(s). Drug induced hyperprolactinemia is defined as normalisation of serum prolactin on discontinuation of the offending drug. Demographics, clinical presentation and offending drug name were entered in pre designed proforma. **Results:** Total of 32 subjects were studied in this study with age of 35.5±10.8years. Predominantly female subjects were present with female to male ratio 5.4. Basal prolactin was 132±68.7ng/mL and after holding the drug prolactin value was 16.9±8.2. Proton pump inhibitors in combination with prokinetics were the leading cause (71.8%) and followed by multiple drug combinations (15.6%), anti-psychiatric drugs(9.3%) and oral contraceptives(3.1%). Overall 86.75% of subjects were having symptomatic presentation. Commonest clinical presentation among the women was galactorrhea (88.9% of female subjects) followed by irregular menstrual cycles (59% of female subjects) and breast heaviness in 29.6%. Among the men erectile dysfunction was common presentation, noted among 80% of them. Asymptomatic presentation was there in 6.25% of subjects. All subjects were improved clinically after withdrawal of the the offending drug(s).
Conclusions: Most of the subjects were clinically symptomatic. Most common symptom in female was galactorrhea followed by irregular menses and breast heaviness, and erectile dysfunction in males. All subjects were improved clinically after withdrawal of the offending drug(s). A detailed drug history is rewarding and avoids unnecessary investigations for hyperprolactinemia