These data highlight a long-term defective corticotroph function in patients with CS following BADx. Low ACTH concentrations long term after BADx for adrenal CS corroborate that corticotroph function fails to recover after CS cure. In the light of these findings, the utility of the synacthen test for excluding secondary/tertiary adrenal insufficiency following CS remission is disputable and remains to be evaluated in future studies dedicated to CS cohorts.

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NEUROENDOCRINOLOGY AND PITUITARY CLINICAL ADVANCES

Longitudinal Study of Prevalence of Sodium Abnormalities in Hospitalized Patients With COVID-19

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Background: Sodium abnormalities (dysnatremia) are frequently observed in patients with community-acquired pneumonia and are associated with excess mortality. Data on the prevalence of hyponatremia and hypernatremia (serum sodium [Na] < 135 and > 145 mmol/L respectively) in patients with coronavirus disease 19 (COVID-19) are currently lacking. **Methods:** The aim of this study was to evaluate the prevalence and etiology of hyponatremia and hypernatremia at several timepoints during hospitalization of COVID-19 patients. This retrospective, longitudinal, observational study included all COVID-19 positive adult patients admitted to two London hospitals over an 8-week period (February to May 2020). **Results:** Clinic records were reviewed in 488 patients, 277 males (56.8%) and 211 females (43.2%), with a median age of 68 years. Comorbidities were documented in 79.6%, with the commonest being hypertension (45.7%), diabetes mellitus (25%), and chronic kidney disease (16.4%). Prior to admission, 25 patients (5.1%) had pre-existing chronic hyponatremia. At hospital presentation, median [Na] concentration was 137 mmol/L. Dysnatremia was present in 146 patients (29.9%), including 26 (5.3%) with hypernatremia and 120 (24.6%) with hyponatremia, of whom [Na] was 130-134 mmol/L in 90 (18.4%) and < 130 mmol/L in 30 (6.2%). Only 19% of patients with < 130 mmol/L underwent adequate laboratory assessment of the etiology of hyponatremia. Of those, based on a urinary sodium cut-off of 30 mmol/L, hyponatremia was classified as hypovolemia in 75% and non-hypovolemic in 25%. For the remaining hyponatremic cases, using 5 mmol/L as the cut-off value for plasma urea, 55.7% were classified as probable hypovolemic and 44.3% non-hypovolemic hyponatremia. There was an upward trajectory of [Na] values during hospital stay with a median increase of 2 mmol/L in the first 48 hours following admission. On the fifth day of hospitalization, the prevalence was similar for hypernatremia and hyponatremia (13.8% and 14.1%, respectively). On the tenth day, hypernatremia was more common than hyponatremia (14.2% vs 10.2% respectively). Analysis of [Na] throughout the hospital stay defined four subgroups; 185 patients (37.9%) remained normonatremic throughout hospitalization; 180 (36.9%) had exposure to hyponatremia; 53 (10.9%) were exposed to hypernatremia; and 70 (14.3%) experienced both hypernatremia and hyponatremia. **Conclusions:** Hyponatremia, usually mild, was common at admission in Covid-19 positive patients, while hypovolemic hyponatremia appeared to be the predominant etiology. During hospital stay, abnormal sodium concentration was recorded in more than two thirds of Covid-19 positive patients. The association of dysnatremia with the outcomes in hospitalized COVID-19 patients warrants further exploration.

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Olfactory Performance in Youth With Full and Subthreshold Avoidant/Restrictive Food Intake Disorder

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Background: Avoidant/restrictive (A/R) food intake disorder (ARFID) is characterized by restrictive eating defined by lack of interest in food, sensory sensitivity, and/or fear of aversive consequences of eating resulting in a failure to meet adequate nutritional and/or energy needs. The complex psychopathology that differentiates ARFID from other eating disorders highlights the need to explore the role of sensory systems in disease etiology. Olfaction has an important role in eating behavior. Specifically, olfactory dysfunction is associated with decreased food intake and appetite. Olfactory performance and associated clinical characteristics have yet to be examined in individuals with ARFID. We hypothesized that higher levels of PYY, which signals satiety, would be associated with poorer olfactory performance; whereas greater food fussiness and A/R eating severity would be associated with stronger olfactory performance. **Methods:** We evaluated a cross-sectional sample of children and adolescents with full and subthreshold ARFID (n=82, 46.2% female, mean age 15.8±3.8). We measured olfactory performance with the Sniffin' Sticks test (Burghardt®, Wedel, Germany) which captures odor discrimination, odor identification, and odor threshold. Higher

scores on all three indices represent stronger olfactory performance. We also measured fasting serum PYY; severity of A/R eating on the Pica, ARFID and Rumination Disorder Interview (PARDI); and food fussiness as a measure of food-related sensory sensitivity on the Adult Eating Behavior Questionnaire. Statistical analyses included T-test and spearman's correlations. **Results:** Greater fasting serum PYY levels were associated with significantly poorer performance on the odor threshold test (r=-0.4, p=0.003). Greater severity of A/R eating (r=-0.3 p=0.008) and food fussiness (r=-0.2, p=0.03) were both associated with significantly poorer performance on the odor discrimination test. **Conclusions:** As predicted, we found that higher levels of PYY were associated with poorer olfactory performance in youth with full and subthreshold ARFID. However, contrary to hypotheses, we found that greater food fussiness and severity of A/R eating were associated with poorer olfactory performance. Future research should investigate whether high levels of PYY and poor olfactory performance are causes, consequences, or correlates of A/R eating.

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Oxytocin Levels in Response to Pituitary Provocation Tests in Healthy Volunteers

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Background: Oxytocin, secreted into the circulation through the posterior pituitary, regulates lactation, weight, and socio-behavioral functioning. Oxytocin deficiency has been suggested in patients with hypopituitarism, however, diagnostic testing for oxytocin deficiency has not been developed. Known stimuli used in the diagnosis of pituitary deficiencies - the hypertonic saline and arginine infusion tests stimulating copeptin levels, and the oral macimorelin test stimulating growth hormone levels - have also been shown to stimulate oxytocin secretion in animal models. We hypothesized that these provocation tests would stimulate plasma oxytocin levels in humans.
Methods: Basal plasma oxytocin levels were measured for all three tests. Stimulated plasma oxytocin was measured once plasma sodium >150 mmol/l for the hypertonic saline and after 45 minutes for the arginine infusion and the oral macimorelin test, expected peak of copeptin and growth hormone levels, respectively. Primary outcome was change between basal and stimulated oxytocin levels using a paired t-test.
Results: Median (IQR) age of all participants was 24 years (22, 28), 51% were female. As expected, copeptin increased in response to hypertonic saline from 4.0 pmol/L [3.3, 6.7] to 34.2 pmol/L [23.2, 45.4] (p-value <0.001) and in response to arginine infusion from 4.6 pmol/L [3.2, 6.2] to 8.3 pmol/L [6.4, 10.8] (p-value <0.001). Growth hormone increased in response to oral macimorelin from 1.6 ng/mL [0.3, 17.2] to 106.0 ng/mL [73.3, 127.2] (p-value <0.001). Oxytocin levels increased in response to hypertonic saline infusion from 0.3 pg/mL [0.3, 0.5] to 0.6 pg/mL [0.4, 0.7] (p-value 0.007), while there was no change in response to arginine infusion (basal 0.4 pg/mL [0.4, 0.6], stimulated 0.4 pg/mL [0.3, 0.6], p-value 0.6), nor to oral macimorelin (basal 38.7 pg/mL [31.1, 66.9], stimulated 34.2 pg/mL [31.2, 48.2], p-value 0.3).
Conclusion: We found that hypertonic saline infusion results in doubling of oxytocin levels. Further research will be important to determine whether this test could be used diagnostically to identify patients with oxytocin deficiency. In contrast to animal data, arginine and macimorelin did not stimulate oxytocin.

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Pituitary Stalk Lesions - Single Center Long Term Observation

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Background & Methods: Pituitary stalk lesions (PSL) are various changes located in the pituitary infundibulum. The underlying pathology and exact diagnosis are difficult to establish due to their unique anatomical locus. A retrospective observational analysis of 60 adult patients (34W/26M) with pituitary lesions was performed. The mean age of diagnosis was 33.8 years (SD 23.7). The etiologies were divided into 3 groups (congenital, inflammatory, neoplastic), classified as exact, probable or unknown and characterized hormonally.
Aim: To present the etiological spectrum of pituitary stalk lesions and their clinical and hormonal characteristics on the basis of long term observation in the pediatric/adult endocrinology departments of our university. **Results:** The most common causes of PSL were neoplasms (20/60, 33.3%, 14W/6M); congenital malformations were detected in 17/60 (28.3%, 6W/11M), while inflammatory etiology was found in 15/60 (25.0%, 9W/6M) of patients. The exact diagnosis was established in 26/60 (43.3%) cases (16 congenital malformations, 6 adenomas, 1 pituitary cancer, 1 craniopharyngioma, 1 germinoma and 1 lymphocytic hypophysitis [LH]). The probable cause was suggested in