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Adrenal gland

A01

Case Report, ePoster

ACTH independent cushing's syndrome secondary to a right adrenal adenoma masked by pregnancy

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Cushing's syndrome can occur as a consequence of prolonged exposure to excessive amounts of circulating free cortisol and the various causes can be broken down into exogenous causes, such as from steroid treatment for chronic illnesses, or endogenous as in this case. Cushing's syndrome can be further classified into ACTH-dependent and ACTH-independent1, for which the latter accounts for 15–20% of all cases. This report highlights the case of a 35 year old female patient who presented with Cushing's syndrome, the symptoms of which were concomitant with pregnancy, unmasked following delivery. She was found to have an ACTH-independent adrenal adenoma found incidentally during the workup for a pulmonary embolism following delivery via Caesarean section. Biochemical testing indicated cortisol excess and CT-adrenal scanning confirmed the presence of a tumour that kept in with an adrenal adenoma. Her case was discussed in our local MDT meeting and she was subsequently referred for laparoscopic adrenalectomy following which she had complete resolution of her symptoms.

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A02

Original Research, ePoster

Aldosterone concentration in the adrenal vein predicting the subtype of primary aldosteronism

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Purpose
Adrenal vein sampling (AVS) is the gold standard method for subtyping primary aldosteronism (PA). A certain number of PA patients had unilateral successful AVS, concomitant autonomous cortisol secretion or indeterminate lateralization index (LI 2.5–4), which made correct interpretation of AVS data impossible. The aim of our study was to determine whether absolute aldosterone concentration can predict the subtype of PA in patients with inconclusive AVS data.
Methods
A retrospective single-institution analysis of 60 PA patients was performed at University Hospital Centre Zagreb between 2015 and 2020. Unilateral successful AVS, autonomous cortisol secretion or patients with AVS LI 2.5–4 were excluded from the study. We calculated the cut-off value of absolute aldosterone concentration predicting healthy or unilaterally diseased glands with optimal sensitivity and specificity. ROC curve analysis was performed with $P < 0.01$.
Results
The optimal absolute aldosterone cut-off value predicting a healthy gland was $\leq$ 12974 pmol/l (sensitivity 82.4%, specificity 87.2%). When we set the specificity to 91% (sensitivity 74%), the aldosterone cut-off value was $\leq$ 9243. On the other hand, the optimal absolute aldosterone cut-off value predicting a unilaterally diseased gland was $>$ 44250 pmol/l (sensitivity 64.7%, specificity 80.8%). Setting the specificity at 90.4% (sensitivity 32.3%) the aldosterone cut-off value was $>$ 66000 pmol/l.
Conclusions
Our data showed that absolute aldosterone concentration could be helpful to predict the subtype of PA in a subset of patients with inconclusive AVS data.

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A03

Case Report, ePoster

Impact of EDP-mitotane for adrenocortical carcinoma on cognitive development in children

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Background
One in 5 million children is affected by adrenocortical carcinoma (ACC) each year. Since prognosis for children older than 4 years is limited, clinicians often choose aggressive treatment with etoposide, doxorubicin, cisplatin (EDP) and mitotane after resection. However, little is known about the impact of EDP-mitotane on development in children. We therefore aimed to provide an overview of side-effects and neurocognitive effects of EDP-mitotane in children.
Method
We searched PubMed for studies listing side-effects or cognitive development in pediatric cases with ACC or Cushing syndrome treated with EDP-mitotane. We have added our own case of a 10-year old girl with ACC treated with EDP-mitotane after irradical resection.
Case
During EDP-mitotane she experienced several side-effects including nausea and hypothyroidism. She developed an impactful, but reversible, decrease in cognitive development measured by a standardized neuropsychological assessment before, during and after mitotane therapy. This decrease was mostly measurable in terms of decreased processing speed and concentration and a significant drop in school performance. Combined with fatigue and insecurity, this caused problems in short-term memory and the need to change her school type.
Review
We found 14 case reports and case series listing side-effects and neurocognitive effects in children treated with EDP-mitotane. The studies listed gastro-intestinal, endocrine and developmental side-effects. Neurocognitive effects included motor- and speech delay, decreased concentration and lower school performance. Especially the gastro-intestinal and neurocognitive side-effects were reversible after mitotane discontinuation.
Conclusion
EDP-mitotane is associated with several side-effects including neurocognitive effects in pediatric cases, all reversible after mitotane discontinuation. This can provide reassurance for clinicians, parents and patients in case mitotane therapy is indicated.

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A04

Case Report, ePoster

Cyclic ectopic Cushing'ssyndromedue to bronchial carcinoid tumor: diagnostic challenge

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Background
Ectopic Cushing's syndrome (ECS) frequently represents a diagnostic challenge due to its complex clinical presentation.

Case presentation: A 57-year-old male presented with typical Cushingoid appearance, high adrenocorticotropic hormone (ACTH) level (138.3 pg/ml), lack of cortisol circadian rhythm and suppression in overnight 1 mg dexamethasone suppression test (DST) (1374 nmol/l). Great daily fluctuation of serum cortisol levels from very high to normal was noticed and confirmed by two different immunoassays. Pituitary CT scan showed secondary empty sella. Results of high-dose DST and corticotropin-releasing hormone stimulation test indicated ECS (cortisol 298.3…244.1 nmol/l, ACTH 15.1…17.5 pmol/l). Chest MSCT visualized a nodular lesion (11.1×7.6 mm) in the lower lobe of the left lung. The octreotide scan showed no radiopharmaceutical accumulation. 18F-FDG PET/CT showed an increased glucose uptake in the left lung nodus, but also in the thickened wall of the rectum, as well as in the sigmoid, transverse colon, appendix and ileum. Colonoscopy with biopsy diagnosed ulcerative colitis. After preoperative treatment with metyrapone, resection of the apical segment was done, and pathohistological finding demonstrated atypical bronchial carcinoid with moderate proliferation index and ACTH expression. Postoperatively, normalization of cortisol and ACTH levels occurred. Two years later, similar symptoms reappeared, recurrent pleural effusions, and elevated levels of serum cortisol (1310 nmol/l) and ACTH (127.6 pg/ml). Chest MSCT differentiated a solid micronodular change corresponding to the recurrence of the underlying disease. Stereotactic radio-surgery was performed and a reduction of the nodular lesion in the lung was achieved two months later, in addition to normalization of cortisol secretion.
Conclusion
Cyclic Cushing's syndrome due to ectopic secretion is a rare disorder that may aggravate the interpretation of diagnostic tests and patient management.

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A05

Original Research, Oral presentation

Should the approach to non-classic congenital adrenal hyperplasia (NCAH) be changed? - a real-life validation of NCAH diagnostic process

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Introduction
Measurement of the baseline level of 17-hydroxyprogesterone (17OHP) is a screening test for NCAH, a less severe form of congenital adrenal hyperplasia.
Aim
A real-life verification of the currently adopted 17OHP threshold (≥2.0 ng/ml) at which the further diagnostic (cosyntropin stimulation test) should be performed.
Material and methods
The study included 400 patients (385 females and 15 males) referred to the Department of Endocrinology in 2004-2021 due to clinical suspicion of NCAH. In each subject a standard 250 μg cosyntropin stimulation test was performed. NCAH diagnosis was made if cosyntropin-stimulated 17OHP level exceeded 10.0 ng/mL. The ROC curve for baseline 17OHP levels was determined, and the baseline cut-off point with the highest sensitivity and specificity was established. The study was approved by the Ethics Board of JUMC.
Results
85 patients (83 females and two males; 21.3% of study group) were diagnosed with NCAH. The 17OHP cut-off value that qualified patients best for further diagnostics was 2.36 ng/ml (sensitivity and specificity 88.2% and 87.0%, respectively). Sensitivity and specificity for the guideline recommended 17OHP cut-off level (≥2.0 ng/ml) were 90.6% and 77.5%, respectively. In women with menstrual disorders the best 17OHP level cut-off point was 2.38 ng/ml (sensitivity and specificity: 88.1% and 85.5%, respectively), while for those without menstrual irregularities it was 2.79 ng/ml (sensitivity and specificity: 95.3%: 83.7%, respectively).
Conclusions
Our results suggest considering an upward shift in the 17OHP threshold at which patients suspected for NCAH should be referred for further evaluation. This may reduce the number of unnecessary cosyntropin stimulation tests, particularly in patients which may not require any treatment. Stratification of 17OHP cut-off values according the clinical presentation of patients suspected for NCAH may also be considered.

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A06

Case Report, ePoster

Sinister cause of amenorrhea in adolescent girls – a case series

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Background
Hirsutism is a common and disturbing complaint among women attending endocrine clinics. It is caused by androgen excess and when severe, might progress to virilization. Virilizing adrenal tumors are a rare cause of hirsutism.
Case presentation
A 14 year old girl presented with primary amenorrhea, poor breast development (Tanner stage B1), hirsutism (Ferriman-gallwey score, FGS of 12/36) clitoromegaly (clitoral index >200 mm^2). Hormonal investigations revealed grossly elevated total testosterone of 7.21 ng/ml and DHEAS > 15 mg/ml. MRI abdomen showed a large 10.7×7.5×7.4 cm adrenal mass, compressing adjacent organs. A diagnosis of virilising adrenal tumor was made and she underwent right adrenalectomy. Biopsy confirmed it to be adrenocortical carcinoma with mitotic rate 8–10 per 50hpf. She underwent adjuvant radiotherapy and is planned for mitotane therapy. Another young lady, 18 year old, presented with oligomenorrhea and hirsutism of one year duration. She was obese with FGS of 15/36, Tanner staging B5P5. She was diagnosed elsewhere to have PCOS and was referred to us for further management. Hormonal workup revealed elevated total testosterone (1.45 ng/ml) and markedly elevated DHEAS (>15 mg/ml). Further workup revealed a normal 17 hydroxy progesterone and a suppressed ONDST. MRI abdomen showed a 3.5×2.6×4 cm left adrenal mass confirming the diagnosis of virilizing adrenal tumor. She underwent left adrenalectomy and biopsy confirmed it to be adrenocortical carcinoma. Post surgery she resumed regular menstrual cycles.
Conclusions
Rapid onset and progression of hirsutism along with very high DHEAS levels should prompt workup for virilizing adrenal tumors. Virilization could be a presenting symptom of androgen secreting adrenocortical carcinoma. Diagnosis of ACC in early stages and timely intervention, might improve survival in a tumor with otherwise very grave prognosis

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A07

Case Report, ePoster

Adrenal and pituitary glands involvement by extranodal diffuse large B-cell lymphoma: a case presentation

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Background
Diffuse large B-cell lymphoma is the most common non-Hodgkin's lymphoma (NHL). It can involve extranodal sites in about 30%, but the involvement of endocrine organs is rare (adrenal involvement is estimated <0.2%) and correlates with poor prognosis. In contrast to pituitary metastases from solid tumors, NHL involvement of the anterior lobe of the pituitary is more frequently seen.
Case presentation
A 84-year-old woman presented to the A&E for intermittent fever, progressive fatigue, night sweats and weight loss started from two months. She referred increasing pain in the left upper quadrant of abdomen. Computed tomography revealed a 8×7 cm left adrenal gland mass with diffuse abdominal lymphadenomegaly. Labs revealed central hypoadrenalism (ACTH 20 pg/ml, serum cortisol 30 ng/ml) with hyponatremia (128 mmol/l) and normokalemia (4.2 mmol/l). Additional evaluations revealed anterior hypopituitarism: TSH:0.01μUI/ml, FT3:1.3 pg/ml, FT4:4.8 pg/ml, FSH:2.5 mU/ml, LH:0.2 mU/ml, IGF-I:<15.00 ng/ml, PRL:55.7 ng/ml. The patient was treated with hydrocortisone 30 mg/day and thyroxine 75 mg/day. Pituitary magnetic resonance showed a 1.3×2.2×1.2 cm heterogeneous mass with intrasellar and suprasellar extension and thickening of the pituitary peduncle. FDG-18 PET/CT revealed lesions with a high metabolism in left adrenal gland, pituitary, nodes, liver and other organs. Following left adrenal biopsy, the diagnosis of diffuse large B-cell non-Hodgkin lymphoma with pituitary and adrenal involvement was

confirmed. Ki-67 index was 65%. The patient later died during hospitalisation after developing massive pulmonary thromboembolism and respiratory failure.
Conclusions
In presence of NHL, endocrine involvement and endocrine dysfunctions must be considered. Clinical signs and symptoms may overlap. A biochemical endocrine assessment should be evaluated, so that a rapid and effective therapy can be started. Hormonal dysfunctions may also be reversible after treatment of lymphoma.

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A08

Case Report, ePoster
Ectopic cushing's syndrome secondary to acinic cell carcinoma of the parotida gland: A case-report

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Background
Ectopic ACTH secretion from metastatic acinic cell carcinoma (ACC) of the parotid gland is extremely rare. ACC is an uncommon, typically indolent, salivary gland neoplasm. Herein, we report a case of a high-grade ACC later diagnosed with Cushing's syndrome (CS).
Case presentation
A 60-year-old man presented with a laterocervical mass. Computed tomography (CT) documented a 39×38 mm mass on the parotid gland and homolateral cervical lymph nodes. Further imaging revealed mediastinal, bone and multiple pulmonary lesions. Parotid fine-needle aspiration cytology and CT-guided biopsy of the lung nodule were compatible with ACC. The patient was referred to parotidectomy with cervical lymph node dissection. While waiting for surgery, severe hypertension, dyslipidaemia, new-onset insulin-dependent diabetes mellitus and hypokalaemia developed. Plasma basal ACTH and 24-urinary free cortisol were markedly elevated. ACTH immunohistochemistry was performed in one of the pathology specimens and immunostaining was observed, confirming the diagnosis of ACTH-dependent CS. Hypercortisolism was managed with metyrapone with early clinical and biochemical response. Local disease progression with skull base involvement precluded surgery, and radiotherapy (RT) for the parotid and cervical lesions was performed, with significant reduction of local disease. Metastatic bone lesions were treated with symptomatic RT. Decrease in antihypertensive therapy, progressive discontinuation of insulin therapy and withdraw of potassium supplementation were noticed after RT and medical treatment. The patient is currently receiving palliative chemotherapy due to progressive pulmonary disease and maintains metyrapone at the last follow-up.
Conclusions
Only ten cases of ACTH-dependent CS secondary to ACC were reported. The unusual presentation of ACC with metastatic disease, as well as the successful improvement of CS after treatment, make this a unique case report among the literature.

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A09

Original Research, ePoster
24-Hour blood pressure profile in patients with adrenal insufficiency

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Introduction
Retrospective analyses suggest an increased risk for cardiovascular diseases in patients with adrenal insufficiency (AI), mainly due to supraphysiological replacement doses.
Objective
To evaluate the 24-hour blood pressure (BP) profile in patients with primary (PAI) and secondary (SAI) AI.
Material and methods
BP threshold criteria for hypertension and dipping status of the 2018 ESC/ESH guidelines were used (24-h: ≥ 130 and/or ≥ 80, daytime: ≥ 135 and/or ≥ 85, night-time: ≥ 120 and/or ≥ 70, non-dippers: nocturnal BP drop < 10%). Results were correlated with hormone replacement therapy, serum electrolytes, plasma-renin-concentration (PAI), salivary cortisol (SC) profile (06:00/12:00/ 16:00/20:00/22:00), 24-hour urinary free cortisol, BMI, waist-to-hip ratio and comorbidities.
Results
Fifty-two patients (30 PAI/22 SAI, age 55 (21-88), 36 females) were included. Twenty-two patients (11 AI/11 SAI) received antihypertensive treatment. Mean 24-h BP values were 124±14/76±10 mmHg (daytime 127±15/79±11, night-time 116±18/69±11). Prevalence of hypertensive 24-h BP was 42% (12% in patients without known hypertension), without differences between AI and SAI. Night-time hypertension was more prevalent than daytime hypertension (50% vs 35% in the whole cohort, 20% vs 8% in patients without known hypertension). Twenty-eight patients (14 AI/14 PAI) were classified as non-dippers. 20:00- and 22:00-SC levels were higher in patients with hypertensive compared to patients with normal 24-h BP (0.062 vs 0.02 $P=0.01$, 0.054 vs 0.016 $P=0.004$) regardless of antihypertensive treatment. Daily glucocorticoid intake was higher in patients with hypertensive 24-h BP (22.5(10-60) vs 20(15-30) mg $P=0.035$).
Conclusion
Ambulatory hypertension and non-dipping were frequent in this small cohort of patients with AI and correlated with higher glucocorticoid doses and exposure to glucocorticoids in the late afternoon/evening. However, validation in larger cohorts is warranted.

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A10

Original Research, Oral presentation
Impact of adrenalectomy on cardiovascular features in patients with adrenal incidentalomas and possible autonomous cortisol secretion: Results from ITACA study

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Background
Patients with adrenal incidentalomas and possible autonomous cortisol secretion (pACS) suffer from a high rate of cardiovascular events and mortality. We have previously showed that left ventricular mass index (LVMi) is higher in patients with pACS, compared with patients with non-functioning adenomas (NFA). To date, the management of pACS is still controversial, with a lack of consensus regarding the benefits of surgery.
Objectives
This prospective longitudinal study (NCT04127552) in patients with pACS aims to assess the effect of surgical and conservative management on cardiovascular and metabolic features.
Methods
At baseline, 102 adrenal adenomas were identified by magnetic resonance. Anthropometric, hormonal and metabolic parameters, echocardiography B-mode ultrasound and noninvasive measurement of arterial stiffness were assessed at baseline and after one year to identify cardiovascular alterations in patients with pACS receiving conservative management (CONS) or adrenalectomy (ADR). Adrenalectomy was chosen according to size of the lesion, cortisol secretion grade, patient's age and cortisol-related comorbidities, following an internal algorithm interpreting the 2016 ESE guidelines.
Results
47 patients completed the 1-year follow-up. According to post-dexamethasone suppression cortisol values, 23 NFA and 24 pACS were found. 14 patients with pACS received CONS and 10 patients with pACS underwent ADR. At 12 months, ADR patients showed a reduction in the median LVMi (-12 g/m^2 (95% CI:-22;-0.24)), compared with CONS group (+10 g/m^2 (95% CI:-0.9;21.7); $P=0.023$). ADR patients showed also a reduction in BMI ($P=0.009$), systolic and diastolic blood pressure ($P<0.001$) than CONS.
Conclusions
pACS is associated with significant cardiovascular complications. In our cohort of selected patients with an adrenal adenoma and mild cortisol secretion, cardiovascular outcomes improved after adrenalectomy.

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A11

Case Report, ePoster
Castleman's Disease resembling an adrenal mass: case report and review of the literature

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Background
The increase use of abdominal imaging have given rise in incidental discovery of adrenal masses. We report a case of a localized Castleman's Disease(CD), mimicking an adrenal mass.
Case report
A 29-year-old woman was found to have a 6 cm, well-circumscribed and hypoechoic, right adrenal incidentaloma during an abdominopelvic ultrasonography. The CT scan confirmed a suprarenal mass with heterogenous contrast enhancement. Adrenal gland could not be identified. Abdominal MRI confirmed the lesion, well-detached from the right kidney. On T2-weighted image, the lesion exhibits iso-hypointensity and small cystic spots inside; fat-suppression sequences showed no lipids contains; liquid contrast displayed mild wash-in and delayed wash-out. Clinically, the patient was asymptomatic. Androgens, aldosterone/renin ratio, 1-mg Dexametasone test and urinary metanephrine were normal. The lesion was successfully removed through laparoscopic approach. Macroscopically, the lesion consisted with the diagnoses of lymph node mass, completely removed together with the right adrenal gland. Histology revealed a giant lymph node hyperplasia (so called Castleman's Disease), hyaline vascular type. At 9-months follow-up, no complications or recurrence were found. We performed a systematic review of the literature on CD specifically found in adrenal region. We found 19 cases(5 males): the mean age was 39.1 ± 12.9 years and mean lesion diameter 5.1 ± 1.2 cm. Only 3 cases described MRI density, all showing T2 hyperintensity of the mass. Our case is the first presenting T2 iso-hypointensity.
Conclusions
Localized CD is a rare benign lymphoproliferative disorder usually occuring in mediastinum. The etiology is still unclear. Suprarenal and para-adrenal solitary location of CD, although very rare, may be mistaken for adrenal tumor. When the imaging is not clear, CD should be considered in the evaluation of a large nonfunctional adrenal mass, especially in asymptomatic young patients.

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A12

Original Research, Oral presentation
Evaluation of urinary free cortisol and late night salivary cortisol as diagnostic tools for Cushing's Syndrome

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Background
Cushing's syndrome (CS) is characterized by inappropriate cortisol secretion and its diagnosis is still challenging for endocrinologist. Nevertheless, CS is a rare condition, making difficult to collect data and establish tests' diagnostic performances.
Objectives
Assessing diagnostic performances of Urinary Free Cortisol (UFC) evaluated by liquid chromatography method coupled with tandem mass (LC-MS/MS) and Late Night Salivary Cortisol (LNSC), and proposing high sensitivity and specificity cut off values.
Methods
Among 3712 patients (pts) referred to Policlinico Gemelli, 75 pts diagnosed with CS based on UFC dosage were included: 39 affected by Cushing's Disease, 18 by adrenal CS, 9 by adrenal carcinoma, 9 by ectopic ACTH secretion. LNSC was also evaluated in 56 pts diagnosed with CS: 38 affected by Cushing's Disease, 11 by adrenal CS, 4 by adrenal carcinoma, 3 by ectopic ACTH secretion. As controls, we evaluated 325 volunteers who underwent UFC and 40 volunteers who underwent LNSC dosage. Pts taking steroidogenesis inhibitors, corticosteroids or with renal impairments were excluded. Mann-Whitney U Test was used to compare quantitative variables between groups. ROC curve and area under ROC curve (AUC) were used to determine tests' discriminating capacities and cut off values. Significance level was set at $\alpha < 0.05$.
Results
UFC and LNSC values in CS pts were higher than in controls groups ($P < 0.01$). AUCs identified both tests as highly predictive for CS. We selected 43.5 μg/24h as UFC most accurate cut off value (sens 97% spec 89%). As cut offs, we also analyzed 70 μg/24h (sens 80% spec 100%) and 60 μg/24h (sens 87% spec 94%), already proposed in other studies. We selected 0.3 μg/dl as LNSC most accurate cut off value (sens, spec 100%).
Conclusions
We confirmed UFC (LC-MS/MS) and LNSC as first line tests for CS as suggested by the Endocrine Society, proposing specific diagnostic cut off values, and showed LNSC to have superior diagnostic performance.

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A13

Original Research, Oral presentation
Adverse events associated to mitotane treatment in patients with adrenocortical carcinoma

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Background
Mitotane is the only drug approved for the treatment of adrenocortical carcinoma (ACC). Although adverse effects (AEs) associated to its use are frequent, detailed information are very limited. Aim was to evaluate the AEs of mitotane monotherapy in ACC patients. Methods: We performed a retrospective multicenter study including 311 ACC patients (F = 200, median age 49 yrs) treated with mitotane as first line of medical treatment. Presence and grade of AEs were collected from medical records and classified according to the CTCAE 5.0 criteria. Results: Median duration of mitotane monotherapy was 20 (1-203) months, during which we observed 3004 AEs with a rate per patients of 9.6 (0-30). The number of AEs significantly correlated with AUC of mitotane levels ($P < 0.001$, rs = 0.23) and duration of treatment ($P < 0.001$, rs = 0.21). Among the laboratory changes, GGT, cholesterol and triglycerides increase were the most frequent (88%, 70% and 42% of cases, respectively). Low-lipidic therapies, including statins and fenofibrate, were used only in 38% and 6% of cases, respectively. Apart from glucocorticoids, specific hormone replace therapy was administrated in 121/172 (70%) patients with hypothyroidism, 44/90 (49%) patients with hypomineralcortisolism, and 20/47 (42%) men with hypogonadism. The most frequent clinical AEs included gastrointestinal and general disorders, such as asthenia (68%), nausea (53%), diarrhea (45%), and anorexia (37%), as well as neurological and psychiatric disorders, such as concentration impairment (33%), vertigo (36%) and depression (22%). Moreover, infections and adrenal crises were reported in 14% of cases. Grade 4 AEs were reported in 24 cases (8%). Mitotane was permanently discontinued due to AEs in 14% of patients. Conclusion: The rate of AEs per patients is higher than previously showed and several less common AEs were found. This first comprehensive overview of mitotane AEs might be helpful in the daily clinical management of ACC patients.

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A14

Original Research, ePoster
Adrenal insufficiency due to autoimmune adrenalitis in pediatric age

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Background
Adrenal insufficiency (AI) is a rare condition affecting children, potentially life-threatening. Autoimmune adrenalitis accounts for 15% of all cases of primary adrenal insufficiency in pediatric age. Most symptoms are usually unspecific, making the diagnosis quite challenging.
Objective
The aim of the study was to describe clinical presentation, biochemical abnormalities, treatment and the clinical course of patients with autoimmune AI.
Methods
We retrospectively collected clinical and laboratory data from AI due to autoimmune adrenalitis patients, observed from 2015 to 2020 in a pediatric endocrinology department of a tertiary care hospital.
Results
Eight patients were identified, 7 males and 1 female. The age at diagnosis ranged from 14 to 17 years old. The most frequent symptoms at presentation were anorexia ($n=5$), weight loss ($n=5$), chronic fatigue ($n=5$), vomiting ($n=4$) and hyperpigmentation ($n=3$). Less frequent symptoms included seizures and altered mental status in context of severe hyponatremia. The symptoms initiated in average 4,4 months prior to the diagnosis. The diagnosis was established by serum cortisol and plasmatic ACTH measurement. These results were unequivocal and no confirmation test was needed in any case. The autoimmune etiology was confirmed in all patients by measuring anti-adrenal antibodies. The most common laboratorial abnormality was hyponatremia ($n=7$), followed by hyperkaliemia ($n=5$) and metabolic acidosis ($n=3$). All patients were medicated with hydrocortisone and fludrocortisone. During the follow-up, one patient presented Graves disease configuring a type 2 autoimmune polyglandular syndrome.
Conclusions
Primary AI is a rare condition in pediatric age. Due to unspecific symptoms, a high suspicion index is crucial to establish the diagnosis. Once autoimmune etiology is confirmed, it is important to initiate the appropriate treatment and search for signs and symptoms of other autoimmune diseases during follow-up.

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A15

Case Report, ePoster
Mitotane therapy: A new spectrum of gravity of known toxicities
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Background
Mitotane has been used in paliative setting in patients with adrenocortical carcinoma. However, this adrenolytic agent has important toxicities with frequent elevation of cholesterol levels (after a median time of 6 months from mitotane start) and serum aminotransferases. However, there are no published reports of clinically apparent liver injury.
Case presentation
We report a case of a 54 year-old man with history of an 11 cm adrenocortical carcinoma ENSAT IV. Three months after adrenalectomy, imaging studies detected a local recurrence/persistence of disease. At that time, serum aminotransferases were in the reference range and he had a shlight increase lipidic parameters (<2 upper limit of normal - ULN). Mitotane was initiated and titulated to 3g/day after two weeks to a maximum of 4g and was suspended after one month, before the excision of local recurrence. Mitotanemia was 2.3 mg/l (14-20 mg/l) and pre-operatory laboratory tests showed an increase of serum aminotransferases $<2\times$ULN and minor increseas of total cholesterol (TC) and LDL cholesterol (LDL-c). Pos-operative period was complicated by the ocorrence of an acute hepatitis with asthenia, jaundice, and acolic stools.
Biochemically
Maximum levels of total bilirrubin $15\times$ULN, direct bilirrubin $6\times$ULN, AST and ALT $15\times$ULN and coagulopathy. CT and c-LDL levels reached maximum values of 561 mg/dL and 416 mg/dL respectively. Abdominal ultrasound and magnetic resonance cholangiopancreatography excluded hepatic lesions, biliar duct dilatation or obstruction; Viral infections and hepatic auto-imunity were excluded and the hepatic biopsy was compatible with a toxic etiology. We assumed mitotane therapy as the most probable cause.
Conclusions
To our knowledge, this is the first report combining such marked cholesterol elevations and in the shortest period of therapy associated with acute liver failure. This case highlights the serious toxicities of this agent, even in subtherapeutical levels.

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A16

Original Research, ePoster
An alternative preoperative management of pheochromocytoma
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Background
A pheochromocytoma is a rare neuroendocrine tumor, originating from adrenomedullary chromaffin cells. The pre-surgical management of pheochromocytoma is classically performed with alpha-blockers. However, in some cases other pharmacological approaches can be considered.
Objective
The aim of the study is to describe the clinical course of patients with pheochromocytoma prepared for surgery with calcium channel blockers (CCB).
Methods
We collected clinical data from patients with pheochromocytoma submitted to surgery in our institution who were prepared with CCB, from 2012 to 2020.
Results
In our institution, 5 patients with pheochromocytoma, 3 males and 2 females, were prepared to laparoscopic surgery with CCB. The ages at diagnosis ranged from 43 to 76 years-old. The mean plasmatic normetanephrine was 989 pg/ml ($RR<196$) and metanephrine 632,4 pg/ml ($RR<65$). Arterial hypertension was controlled with nifedipine (60-90 mg/day) in four patients and with amlodipine (5 mg/day) in one patient. During the surgery, three patients needed sodium nitroprusside and a short acting beta-blocker during the tumor manipulation, showing recovery. One patient presented arterial hypotension after tumor removal that solved with phenylephrine. No other intercurrences were registered. Three patients were discharged in 2 days, one patient in 4 days, and the longer hospitalization lasted 8 days due to a respiratory infection.
Conclusions
We can consider that patients with pheochromocytoma can be submitted to a successful surgery without preoperative profound and long-lasting alpha adrenergic blockade. According to literature, alpha blockers are associated to orthostatic hypotension, reflex tachycardia and refractory hypotension after tumor removal. Thus, calcium channel blockers might be a safe alternative in pre-surgical management, with less adverse effects, being easy to titrate and without the need of hospitalization before surgery for hemodynamic stabilization.

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A17

Original Research, Oral presentation
Characterization of transcriptional and miRNA based dysregulations in Cushing's syndrome
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Introduction
Transcriptional regulation of gene expression by miRNAs is critical for the fine-tuning of adrenal stress response. However, its role in hypercortisolism has not been explored well. The study addresses this gap using adrenal samples of 3 patient groups from the German Cushing's registry: Cortisol-Producing-Adenoma (CPA), Primary Bilateral Adrenal Hyperplasia (PBMAH) and controls (adrenal samples of patients with pheochromocytoma).
Methods
Next generation sequencing based miRNA profiling and associated target analyses by QPCR were performed. Transcriptomic data of RNA-Seq were analysed and validated by QPCR. For pathway mapping bioinformatic tools (R, String, KEGG, Gprofiler) were used.
Results
miRNA based NGS revealed 23 miRNAs to be differentially expressed between Cushing (PBMAH and CPA) and Controls. Of these, significantly upregulated miRNAs ($n=6$) were used for validation. Upregulated expression of hsa-miR-139-3p ($l2fc>1.4$), hsa-miR-1247-5p ($l2fc>2.5$) and hsa-miR-150-5p ($l2fc>$

1.9) in PBMAH and CPA (vs Controls) could be confirmed by QPCR ($P<0.05$). Next, the experimentally validated targets of the individual miRNAs were selected from miRWALK and majority of the selected genes were found to be involved in steroid biosynthesis (Alox15, Cyp2b6, Cybrd1). In-vitro and QPCR analyses of the targets are in process. In case of RNA seq, PBMAH was found to have the most dysregulated genes compared to Controls and CPA ($n=1248$). Pathway mapping using the significantly altered genes in PBMAH gave neuronal synaptic signalling as top hits. Specifically, there was an increased expression (l2fc >5; $P<0.05$) of dopamine (Drd2) and glutamate receptors (Gria4, Grin2a) in PBMAH. Validation of the pathway analysis is on-going.
Conclusion
This study identifies a miRNA-target gene network in possible steroid biosynthesis dysfunctions in adrenals of patients with Cushing's syndrome. Additionally, potential changes in neuronal synaptic pathways in PBMAH were identified.

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A18

Case Report, ePoster

Coexistence of bilateral pheochromocytomas, unilateral adrenocortical adenoma and prolactinoma

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Background
An increasing number of mutations are associated with pheochromocytomas. Genetic screening is advocated in all cases and immunohistochemistry as well as phenotype profile recognition may permit a more targeted screening for specific genes.
Case Presentation
A 54-year-old male presented with symptoms compatible with pheochromocytoma and increased levels of plasma normetanephrines, metanephrines and 3-methoxytyramine. On Computed Tomography, the left adrenal was 4.6 cm, with nonenhanced attenuation values~40Hounsfield Units(HU), whereas the right adrenal was 4.7 cm, ~10HU. Delayed contrast medium washout was observed bilaterally. On 123|–metaiodobenzylguanidine there was uptake in the whole left adrenal gland, but in a small part of the right adrenal, indicating the possible coexistence of an adenoma. A 6.5 cm left pheochromocytoma (ki67:7%, PASS-score:8) and a 3 cm right pheochromocytoma were resected. Postoperatively increased plasma normetanephrines persisted. Ga68/DOTATOC-PET showed both medullary and adenoma residuals on the right side. The residual right pheochromocytoma and an adrenocortical adenoma (5 cm, Ki67:1%, Weiss:1/9) were resected. Immunohistochemistry revealed no loss of expression of the proteins Menin, SDHB and SDHA suggesting there were no mutations in MEN1 and SDHx genes. There were no clinical evidence of MEN2, VHL and NF1. Due to hyperprolactinemia (109 ng/ml) and hypogonadotropic hypogonadism (testosterone: 157 ng/dl) pituitary MRI showed enlarged pituitary (1.7 cm). Cabergoline improved hyperprolactinemia and hypogonadism.
Conclusions
Our patient had bilateral pheochromocytomas, unilateral adrenocortical adenoma and pituitary enlargement, an association that indicates a possible multiple endocrine neoplasia syndrome. From the clinical and biochemical data we had no evidence of the most common genetic syndromes. Genetic testing was negative for known pathogenic variants of RET, VHL, TMEM127, NF1, SDHB, MAX, FH, SDHD, SDHA, SDHC, SDHAF2, CDKN1B, EGLN1, GDNF, KIF1B, MEN1, PRKAR1A.

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A19

Case Report, ePoster

Post-menopausal woman with adrenal incidentalomas and significantly elevated levels of 17-OH progesterone

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Background
In patients with adrenal nodules increased 17-OH Progesterone (17-OHP) does not necessarily indicate congenital adrenal hyperplasia (CAH) since adrenocortical tumors may harbor defects in steroidogenesis resulting in high steroid precursors, either basally or, usually, after Synacthen stimulation. Secretion of precursors has been associated with malignancy but it can also be present in benign adenomas.
Case Presentation
A 62-year-old lady with hypertension and dyslipidemia was referred for bilateral incidentalomas (a left mass gradually increasing over 14 years from 2.3 to 4.7 cm and a stable 1.4 cm right adenoma known since 2016). Past medical and gynaecological history were unremarkable. On clinical examination mild moon face and central myopathy were noted, BMI was 28.4 kg/m^2. Hormonal investigation showed mild autonomous cortisol excess (cortisol post 1 mg dexamethasone 2 μg/dl) ACTH 16.9 pg/ml and UFC 61 μg/24h. Basal levels of 17-OHP were high but varied widely on three occasions (50.6, 29.3 & 12.5 ng/ml) whereas androgens were low (testosterone 6 ng/dl, androstenedione 0.9 ng/ml and DHEA-S <15 μg/dl). Stimulated levels of 17-OHP were 49.5ng/ml. The patient underwent left adrenalectomy (5 cm, Ki-67:1%, Weiss: 0/9), the levels of 17-OHP normalized (2 ng/ml) whereas androgens remained suppressed. She did not develop adrenal insufficiency (morning cortisol 12.1 μg/dl, ACTH 46.8 pg/ml).
Conclusions
High 17-OHP level related to CAH due to CYP21A2 or CYP11B1 deficiency was not likely based on low androgens and the lack of past medical history compatible with a genetic steroidogenesis defect. Given the biochemical features suggestive of combined CYP21A2 and CYP17A1 impairment, we postulate the adrenal tumor secreted 17-OHP due to steroidogenic enzymatic defect probably secondary to the adenomatous proliferation but CYP staining or mRNA sequencing was not performed.

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A20

Case Report, ePoster

Severe Cushing's syndrome due to ectopic ACTH secretion from small cell lung carcinoma with adrenal metastases

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Background
ACTH-dependent Cushing's syndrome (CS) is mostly associated with corticotroph adenomas or, infrequently, ectopic ACTH secretion(EAS). Adrenals may show diffuse bilateral enlargement or even macronodules. Adrenal metastases may occur in various cancers. They are often bilateral, irregular, with attenuation values >20 Hounsfield units(HU) on unenhanced CT scan and elevated SUVmax on FDG-PET scan. They may cause adrenal insufficiency due to the destruction of adrenal cortex, in which case glucocorticoid replacement therapy can improve the patient's quality of life.
Case Presentation
A 62-year-old male presented with hypokalemia (2.1 meq/l), hyperglycemia (350 mg/dl) and deteriorating muscle weakness. Diagnosis of severe ACTH-dependent CS was confirmed by significantly elevated levels of cortisol (1931 nmol/l), 24-h urinary free cortisol $>11\times$ULN (>2760 nmol/24 hr) and ACTH(60 pg/ml). Adrenal glands were bilaterally enlarged, ~50HU on CT with inhomogeneous contrast enhancement. There were sizable lung and pancreatic tumors and peritoneal implants. On FDG-PET scan, there was uptake on all lesions (adrenals' SUVmax: 10.5) as well as bones, compatible with multiple metastases. Transbronchial biopsy diagnosed poorly differentiated small cell neuroendocrine lung carcinoma with ACTH production, ki-67:90%. Hypercortisolism responded to metyrapone 2 gr/day (~369 nmol/l) within 4 days. Cortisol levels decreased further after chemotherapy. After 2 cycles of etoposide/cisplatin the patient is eucortisolemic, normokalemic with well-controlled diabetes without metyrapone.
Conclusions

Based on the CT and FDG-PET findings, we consider that the adrenal gland lesions probably represent metastases, rather than ACTH-induced adrenal hyperplasia. Adrenal biopsy that could confirm our hypothesis was not performed since it would not provide patient-relevant benefit. Although adrenal metastases usually cause adrenal insufficiency, in this patient they were associated with severe CS indicating the presence of non-infiltrated adrenal cortex, stimulated by EAS by the primary tumor but also possibly by adjacent metastatic cells.

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A21

Original Research, ePoster

Impact of COVID-19 on patients with primary adrenal insufficiency: A cross-sectional study

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Background

Patients with primary adrenal insufficiency (PAI) carry an increased risk of infections which can precipitate adrenal crises. They are thought to be more likely to contract COVID-19 and develop severe disease; however, little is known about the true impact of COVID-19 on these patients.

Objectives

To assess the response of a large single-centre cohort of PAI patients to COVID-19, focusing on morbidity and health promotion attitudes.

Methods

In May 2020 we posted COVID-19 advice to all PAI patients under the care of a large secondary and tertiary centre, including guidance on stringent social distancing. Through January-April 2021, we conducted a telephone survey with a semi-structured questionnaire.

Results

162 of 256 contacted patients responded (82 with Addison's disease, AD; 80 with congenital adrenal hyperplasia, CAH). AD patients were older (median 51 vs. 39 years) and had a higher prevalence of autoimmune diseases (42.7% vs. 10.0%) and other comorbidities (Charlson comorbidity index ≥ 2 in 47.6% vs. 10.0%) (all $P < 0.05$). 47 patients (29.0%) had confirmed or suspected COVID-19, the second most common cause of sick day dosing during the pandemic. 15 patients (9.3%) had confirmed COVID-19, similar to the infection rate of the general population. 18 adrenal crises occurred, and COVID-19 was the leading cause (4 cases). CAH patients carried a higher risk of confirmed or suspected COVID-19 than AD patients (68.1% vs. 31.9%), had more COVID-19 vaccine hesitancy, and were less likely to wear medical jewellery (36.3% vs. 64.6%) and have had hydrocortisone self-injection training (80.0 vs. 91.5%) (all $P < 0.05$).

Conclusions

PAI patients provided with social distancing guidance had similar COVID-19 infection rates to the background population, but COVID-19 was a major trigger for sick day dosing and adrenal crises. CAH patients were more likely to have confirmed or suspected COVID-19 than AD patients and showed less engagement with health promotion strategies.

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A22

Original Research, Oral presentation

Steroid profiling using liquid chromatography mass spectrometry during adrenal vein sampling in patients with primary bilateral massive adrenal hyperplasia

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Background

Primary bilateral macronodular adrenocortical hyperplasia (PBMAH) is a rare cause of ACTH-independent Cushing's syndrome. The clinical application of adrenal venous sampling (AVS) in diagnostic work-up for PBMAH is still controversially discussed. AVS might be useful in evaluating the predominant side and guiding the decision for unilateral adrenalectomy in PBMAH.

Objectives

Our aim was to evaluate whether certain metabolites in AVS samples could help in successful identification of the dominant side and to characterize possible biochemical differences between the adrenals in PBMAH patients.

Methods

For this retrospective analysis, we included 17 patients with PBMAH of the German Cushing's registry who underwent AVS without ACTH stimulation. Using LC-MS/MS we quantified 15 steroids, of which 11 adrenal specific steroids were included in the analysis. All data were evaluated by SPSS 26.0 and Graphpad prism 8.0.

Results

Cortisol and DHEAS was the most dominant metabolites in AVS samples. Correlation matrix analysis showed that DHEAS had no significant correlation with any other steroids and was most stable across the samples. Based on this finding, DHEAS was taken as the reference. Using DHEAS based lateralization index (cut off 2.0) adrenals were divided into dominant and non-dominant adrenals. Conversion ratios (metabolite/its precursor) (Zhai *et al*. 2015) identified unique differences between the adrenals. Particularly, the conversion ratio of aldosterone from its precursor Corticosterone, mediated by CYP11B2 is higher in non-dominant than in dominant adrenals (aldosterone/corticosterone, $P < 0.05$).

Conclusions

This study characterize the biochemical output of adrenals in AVS samples of patients with PBMAH. The analysis helps to identify key steps in the metabolite pathway, that appear dysregulated especially in dominant adrenal gland. Furthermore, the study also characterize DHEAS as a potential reference hormone in future AVS measurements.

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Diabetes

D01

Original Research, ePoster

How does age and sex impact on presentation, clinical course and outcome of diabetic ketoacidosis in type 1 and type 2 diabetes?

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Background

Diabetic ketoacidosis (DKA) is an acute endocrine emergency in people with diabetes. Paucity of information prevails over sex- and age-related variations in patients presenting with DKA.

Objective

To assess the impact of age and sex in the clinical course, presentation, outcome and management of DKA in people with type 1 (T1DM) and type 2 diabetes (T2DM).

Methods

We included all DKA from April 2014 to September 2020 in a large tertiary care centre in the UK. Data on patient demographics, type of diabetes, DKA duration, length of hospital stay, metabolic parameters on presentation, Insulin requirements and complications during treatment were collected. Further subgroup analyses on presentation, management, complications, and outcome parameters were repeated in subgroups according to sex (male and female) and age groups (<20, 20-29, 30-39, 40-49, 50-59, 60-60, 70-79, >80).

Results

583 (75.9%) T1DM and 185 (24.1%) T2DM episodes were identified. The median age was 38.2 years (IQR 23.8-56.8) and the male: female ratio was 1:1.04. T2DM were older (T1DM 29.0 years (21.9-48.7) vs T2DM 61.5 years (52.0-75.1); $P < 0.0001$). Men with T1DM had higher blood glucose at presentation

(T1DM 28.7 mmol/l (22.2-37.3) vs T2DM 24.9 mmol/l (18.0-34.9) $P=$ 0.0388) whilst women with T1DM had more episodes of hypoglycaemia (T1DM 0.0 (0.0-1.0) vs T2DM 0.0 (0.0-0.0); p $P=0.0195$) during DKA treatment. Women with type 2 diabetes had higher urea and serum osmolality on presentation (8.8 (5.8-14.5) ;316.2 (302.67-329.95)). No other differences in metabolic parameters in other age groups were observed and no difference in the DKA duration was noted between the two groups across age and sex.
Conclusions
While there are some differences in presentation and severity across age and sex, there were no differences in DKA duration suggesting the current management guidelines can be applied across all these groups.

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D02

Original Research, ePoster
Impact of ethnicity on presentation, management and outcome of diabetic ketoacidosis in type 1 and type 2 diabetes mellitus

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Objectives
Limited evidence exists studying the impact of ethnicity on diabetic ketoacidosis (DKA). We aimed to study the impact of ethnicity on presentation, management and outcome of DKA in type 1 (T1DM) and type 2 (T2DM) diabetes.
Methods
All DKA episodes from April 2014 to September 2020 in a UK tertiary care centre were identified. Data were collected on diabetes type, demographics, biochemical and clinical features on admission, and DKA management. StataSE16 was used for analysis. As data were skewed, median and interquartile range (IQR) are presented with Wilcoxon sum rank test used to compare groups.
Results
583 (75.9%) T1DM and 185 (24.1%) T2DM episodes were included. Non-white ethnic groups were significantly overrepresented in T2DM (proportion of Whites in T1DM 80.3% vs T2DM 73.5%; $P=0.030$). In people of White ethnicity, those with T1DM presented more hyperglycaemic than those with T2DM (T1DM 28.20 [IQR 20.45-34.25] vs T2DM 23.60 [15.61-29.60]; $P=0.01$). Conversely, in those of a Black ethnicity, patients with T2DM diabetes presented more hyperglycaemic (T1DM 22.90 [18.30-37.30] vs T2DM 38.80 [31.10-39.60]; $P=0.03$). People of Asian ethnicity had higher lactate levels in T2DM (T1DM 2.54 [1.91-3.80] vs T2DM 4.20 [3.40-6.17]; $P=0.01$). There were no differences in DKA duration, though length of hospitalisation was greater in those with T2DM in all ethnicities apart from Blacks. When data was disaggregated by diabetes type, statistically significant differences were seen between ethnicities in urea in T1DM and bicarbonate, lactate and serum osmolality in T2DM, but not DKA duration or length of hospitalisation.
Conclusions
Non-white ethnicities are more likely to present with DKA in T2DM. In non-White ethnicities, DKA may present with more severe biochemical abnormalities in T2DM than in T1DM. While there are differences in presentation and severity of DKA between ethnicities in T1DM and T2DM, management and outcome of DKA were unaffected.

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D03

Original Research, Oral presentation
A study of type 2 diabetes mellitus with special reference to diabetic kidney disease and its co-relation with neutrophil lymphocyte ratio

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Introduction
Diagnostic markers to detect Diabetic Kidney Disease (DKD) at an early stage are important. Neutrophil to Lymphocyte ratio (NLR) is an easily available parameter to assess the inflammatory status of the subject and has shown its usefulness in prognostication of Cardiovascular diseases and Malignancy. Very few studies have explored the association between NLR and DKD in the North-Eastern Indian population with type 2 diabetes mellitus.
Objectives
To estimate Neutrophil–Lymphocyte ratio in patients with and without DKD. To study its co-relation with DKD.
Methods
This cross-sectional study was conducted in Gauhati Medical College. 135 Type 2 DM patients who gave consent and satisfied the inclusion criteria were included in the study. Demographical Data was be analyzed by descriptive statistics and expressed as mean with standard deviation. The co -relation was assessed between NLR and patients without proteinuria, with microalbuminuria and macro-albuminuria using SPSS software and computer-based randomization.
Results
Amongst 135 individuals in the study, the mean age of the study population was 54.44 ± 11.69 years. The female-to-male ratio is 1.071: 1. The mean duration of disease was 6.2 ± 4.8 years. The mean BMI was 25.8 ± 7.2 The mean NLR was higher in patients with microalbuminuria (3.33 ± 1.7) and macro-albuminuria (4.88 ± 2.77) compared to those without proteinuria (2.29 ± 1.55) and was of statistical significance. The 24hour protein, creatinine and e-GFR was also statistically significant between these groups.
Conclusion
The NLR was significantly higher in patients with micro-albuminuria and macro-albuminuria compared to patients without proteinuria. It can be considered as a surrogate marker for the detection and prognostic purposes of Diabetic Kidney Disease. We hope this study adds to the existing data and paves way to future, well matched, prospective studies which may define in detail about the temporal correlation between NLR and DKD.

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D04

Original Research, ePoster
TENS can be used as a new tool in diagnosing vibration sense for early detection of diabetic peripheral neuropathy

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Introduction
When diabetes mellitus is diagnosed, peripheral neuropathy is present in about 20 % of cases. Vibratory sense is perceived by mechanoreceptors, which have 2 types, Pacinian corpuscles and Meissner corpuscles. Pacinian corpuscles consist of large myelinated A-beta fibers detecting high frequency vibration and deep pressure. There are new methods to evaluate vibration sense and pressure sensation acting on Aβ, and C type fibres. TENS is considered as a non-invasive, cheap technique. conventional TENS act through stimulating large diameter (A-beta) nerve fibers.
Materials and methods
100 patients into 2 parallel groups. In all patients (diabetic patients and controls), we evaluated the presence of peripheral neuropathy by using a 128 Hz tuning fork and TENS (Transcutaneous electrical nerve stimulation). Here in this trial we chose 1 point in each foot: the hallux. TENS probes were placed adjacent to the hallux. TENS units intensity ranges from 1 mA to 100 mA. The vibration sense testing using a tuning fork was Performed with a tuning fork with a free vibration frequency of 128 Hz. The measurements were taken at hallux on the right and left foot. According to results we can divide diabetic neuropathy to mild in which the patients fell sense from 40 mA to 60 mA, moderate in which the patients feel sense from above 60 mA to 80 mA, severe in which the patient feel sensation from above 80 mA to 100 mA. control group fell sensation up to 40 mA. a score of vibration perception graded from 0 (no sensation) to 8 loss of sensation after 8 seconds) when using a tuning fork.
Results
The results show a statistically significant difference between diabetic patients and control by using TENS in which there is significant decrease in vibration sense in diabetic patients in comparison to control. With p value less than 0.0001. The results also show a statistically significant difference between diabetic patients and control by using 128 Hz tuning fork, in which there is significant decrease in vibration sense in diabetic patients in comparison to control. With p

value less than 0.0001. Comparing sensitivity and specificity of tens on right foot and tuning fork on right foot showing that tens has sensitivity of 94% and specificity 96% and tuning fork sensitivity of 83% and specificity 94 %. Denoting that tens is better than tuning fork in detecting vibration sense and early detection of diabetic peripheral neuropathy.
Conclusion
DPN is very common in diabetic patients but it may take a long time to be diagnosed. This may lead to life threatening complications, like amputation. So it is critical to find new ways of diagnosing DPN early. TENS may be considered as a new way of evaluating DPN.

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D05

Case Report, ePoster

Hirata's disease: A tale of two women with hypoglycaemia

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Background
Insulin Autoimmune Syndrome is a rare condition characterized by hyperinsulinemic hypoglycemic episodes mediated by insulin autoantibodies (IAA). IAA form complexes with insulin leading to initial mild hyperglycemia and later hypoglycemia due to release of insulin. A comprehensive evaluation is necessary in all hyperinsulinemic hypoglycemia before a diagnosis of IAS is established. We present two cases of Hirata's disease which presented with debilitating hypoglycemic episodes.
Case presentation
Two middle-aged women, presented with frequent episodes of sweating, palpitation and tremors for 3-4 weeks. One of them was hypertensive, diabetic on oral agents & the other one was prediabetic. Both had documented hypoglycemic episodes in fasting and postprandial state with blood glucose < 45 mg/dl which relieved with food. They were subjected to a 72-hour fasting test. Our first case, who was earlier evaluated for fasting hypoglycemia and found to have fasting insulin of 89.8 μIU/ml in the presence of venous blood glucose of 41 mg/dl. After subjecting to 72-hour fasting, she developed hypoglycemia within 12 hours of fasting, with insulin levels being 12,912 μIU/ml. IAA was >100 mCU/ml (normal < 5). Second case, on evaluation had postprandial insulin levels: >600 μIU/ml, fasting insulin: >300 μIU/ml, fasting C-peptide-8.17 ng/ml. She was subjected to OGTT as she did not develop hypoglycemia after 40 hours of fasting. At the end of the 4th hour of OGTT, she developed hypoglycemia with RBS 40 mg/dl & corresponding insulin 117.7 μIU/ml. IAA was 90.4 mCU/ml. Imaging of the pancreas was normal in both cases. They became asymptomatic with a course of steroid.
Conclusion
It is important to note that Hirata's disease can present as both fasting and postprandial hyperinsulinemic hypoglycemia. These cases highlight the importance of IAA and teach us that conventional imaging studies, fasting tests and OGTT alone may not be sufficient for a complete evaluation of hypoglycemia.

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D06

Original Research, ePoster

Factors predisposing to diabetes onset in hospitalised COVID-19 patients

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Background
The presence of diabetes and the degree of hyperglycemia is considered an independent factor in the clinical severity of COVID-19 infection, impacting the duration of hospital stay and other related medical conditions.
Objective
To identify the correlation between the insulin needs in COVID-19 patients and hospital stay and other related medical conditions. To identify the factors that would contribute to diabetes onset during COVID-19 infection.
Methods
This is a retrospective cohort study analyzing data from 70 COVID patients hospitalised between December 2020-March 2021. The cohort was stratified in 3 groups: A-patients already diagnosed with diabetes, B-patients with newly-onset diabetes, C-patients with no diabetes. Baseline characteristics, comorbidities inflammatory markers, glycemic values and clinical prognosis, including hospital stay were examined.
Results
Mean HbA1c value was 6.9% (SD ± 2.16), with a maximum insulin requirement of 55 UI/day (SD ± 42.87). Higher maximum insulin requirements were statistically related to longer hospital stay (p 0.031). All patients took dexamethasone, ranging from 4 to 40 mg (mean 13 mg) but no statistical significance was found between dexamethasone dose and maximum insulin needs. In the group with newly-onset diabetes, we noticed a statistically significant correlation between maximum total daily dose of insulin per patient during hospitalisation and hospital stay (r 0.474, p 0.035). These patients had higher HbA1c in admission (mean 5.7 % +/- 0.4 vs 5.4% +/- 0.3, *P* 0.026) and more comorbidities (80% vs 40%, *P* 0.024), mostly cardiovascular disease including hypertension (70 % vs 21%, *P* 0.024), compared to the group that didn't develop diabetes.
Conclusions
Presence of diabetes affects longer hospital stay in COVID-19 patients. Prediabetes, presence of comorbidities particularly cardiovascular disease are factors that could predispose to the onset of diabetes during COVID infection.

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D07

Original Research, ePoster

Red blood cell membrane fluidity in type 2 diabetes mellitus

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Background
Cell membrane fluidity of erythrocytes in patients with type 2 diabetes can be influenced by glycosylation processes, changes in lipid homeostasis and oxidative stress.
Objectives
We have measured red blood cell membrane fluidity looking for differences between healthy people and diabetic subjects and also between diabetic patients affected by macroangiopathy (vascular diabetic foot) and not.
Methods
We have enrolled 32 subjects: 8 healthy controls (group G0), 9 diabetic patients without macroangiopathy (G1) and 15 with macroangiopathy (G2). We have used an inverted confocal microscope to analyze images of erythrocytes labeled by the Laurdan probe, that varies its fluorescence emission based on the polarity of the membrane, discriminating between fluid-crystalline state (emission spectrum at 490 nm) and state gel-like (less fluid, emission spectrum at 440 nm). Results of fluidity analysis have been calculated as GP index, "generalized polarization" (G *P* = (I440 nm - I490 nm) / (I440 nm + I490 nm)), that assumes values between -1 and +1, where lower values tending to -1 indicate higher fluidity.
Results
diabetic patients have an higher GP index compared to healthy subjects ($p < 0.01$). GP mean value grows among the three groups: in G0 is 0.600956 (±0.005161), in G1 0.626324 (±0.015676) and in G2 0.641015 (±0.008644), with a GP index significantly higher in G2 than in G0 ($p < 0.01$). We have found a direct correlation between GP and triglyceridemia mean value and an inverse correlation between GP mean value and HDL cholesterol mean value.
Conclusions
Diabetic patients, compared to healthy subjects, have a less fluid cell membrane fluidity with a further reduction in patients affected by macroangiopathy. These results suggest the utility to integrate analysis of membrane fluidity with laboratory exams (like HbA1c) for an early identification of macroangiopathic complications.

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D08

Case Report, ePoster

Paraneoplastic hypoglycaemia: An insulin like growth factor-2 producing tumour

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Background
Insulin like growth factor-2 (IGF-2) has structural similarity to insulin1. In excess, IGF-2 can activate glucose metabolism so precipitating hypoglycaemia1.
Case Presentation
Six days following her second dose of Doxorubicin and Olaratumab therapy for a pelvic sarcoma, HS presented with two successive days of acute confusion secondary to documented hypoglycaemia (blood sugars 2.0-3.1 mmol/l, 36-55.8 mg/dl). Despite treatment, she had recurrent symptomatic hypoglycaemia. She reported similar confusion episodes following the first cycle of chemotherapy 2 months previously. Initial investigations reported appropriate values for random cortisol, TSH and free T4. Further investigations revealed appropriately suppressed insulin and c-peptide that excluded insulinoma. The IGF-2 was elevated with an IGF-2:1 ratio of 25.9 (Normal Ratio <10). This was consistent with non-islet cell tumour hypoglycaemia. It was theorised that the chemotherapy related exacerbations were a consequence of tumour destruction and subsequent IGF-2 release. HS was managed with oral glucocorticoid therapy with symptomatic improvement and a documented reduction of hypoglycaemic events. She was discharged with blood sugar monitoring, dietary advice for frequent high sugar snacks and advice for hypoglycaemia treatment. Histology was reviewed for IGF-2 staining. With cautious steroid titration, HS was able to continue with her combined chemo-and immunotherapy regime.
Conclusions
This case reviews the common causes of non-diabetic hypoglycaemia, including immunotherapy-mediated hypoglycaemia (hypophysitis, thyroiditis and adrenal insufficiency). It focuses on an uncommon but well documented cause of recurrent hypoglycaemia; paraneoplastic IGF-2.
Reference
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D09

Original Research, ePoster

How does the difference in severity at presentation affect the management and outcomes of diabetic ketoacidosis in people with type 1 and type 2 diabetes?

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Objectives
We explored the differences in severity and outcomes of diabetic ketoacidosis (DKA) in people with type 1 (T1DM) and type 2 diabetes (T2DM).
Methods
All DKA episodes from April 2014 to September 2020 at a tertiary care centre in the United Kingdom were identified. People admitted with DKA were classified as having T1DM or T2DM based on previously established diagnosis, autoantibody status, and/or phenotypic features. We compared the differences in severity at presentation (pH, bicarbonate, glucose, lactate, serum osmolality, urea), complications during management (hypoglycaemia, hypo- or hyperkalemia), total DKA duration and length of stay between the two groups.
Results
A total of 768 DKA episodes were included [T1DM: 75.9% ($n=583/768$); T2DM: 24.1% ($n=185/768$)]. There was no difference in severity as assessed by biochemical profiles on admission [median pH (T1DM vs T2DM: 7.22 vs 7.24; $P=0.3266$), bicarbonate (11.90 vs 13.20; $P=0.2192$), glucose (28.00 vs 26.55; $P=0.4496$), lactate (2.6 vs 2.6; $P=0.6532$), serum osmolality (310.07 vs 312.13; $P=0.2787$)] between the two groups, except for urea, which was higher in T2DM [7.1 vs 8.9; $p<0.0001$]. People with T1DM had more episodes of hypoglycaemia [median (interquartile range) T1DM 0(0-1); T2DM 0(0-0); $P=0.0056$] during DKA management. There was no difference in the number of episodes of hypokalaemia [T1DM: 0(0-1); T2DM: 0(0-1); $P=0.3229$] or hyperkalaemia [T1DM: 0(0-0); T2DM: 0(0-0); $P=0.1356$] during treatment for DKA. Although there was no difference in total DKA duration between the two groups [median; T1DM vs T2DM: 13.92 vs 13.90; $P=0.4638$], people with T2DM had significantly longer hospital stay [median; T1DM vs T2DM: 2.95 vs 11.02; $P<0.0001$].
Conclusions
Both T1DM and T2DM groups with DKA had similar severity at presentation and total duration suggesting the existing guidelines for DKA management caters for both groups. People with T2DM required a longer hospital stay, suggesting a need for more complex care.

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D10

Original Research, Oral presentation

The relationship between pre-admission insulin usage and mortality of people with diabetes diagnosed with COVID-19

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Introduction
Although the effect of pre-admission insulin usage (PAIU) in diabetic COVID-19 patients remains uncertain, early studies have reported worse results in this group. Studies generally report in-hospital mortality rates. However, mortality also increases after discharge in COVID-19 patients; the effect of PAIU on this issue is unknown. This study was conducted to examine the effect of PAIU on COVID-19 diabetics' 90-day mortality data, including the post-discharge period.
Material Method
All diabetic patients hospitalized in Canakkale Onsekiz Mart University Medical Faculty Hospital between March 2020 and December 2020 due to COVID-19 were retrospectively included in the study. 90-day mortality and PAIU data were obtained from health system records. Cox regression was used to estimate the hazard ratio (HR) of COVID-19-related mortality in people PAIU, with covariate adjustment confounding by clinical and laboratory factors.
Results
In 631 diabetic patients, the PAIU rate was 33.4%. The 90-day mortality rate in PAIU was higher than non-insulin user diabetics (33.2% vs. 24.3%, P: 0.018). Univariate logistic regression analysis was showed that 90-day mortality increased 1.54 times in PAIU patients (OR=1.54, 95% CI=1.07-2.22, $P=0.018$). Nevertheless, the mortality effect of PAUI disappears when adjusted according to age, gender, presence of COPD, presence of hypertension, creatinine, ALT and glucose levels. The adjusted HR of PAIU was 1.26 (95% CI 0.91–1.74, $P=0.15$). In this model, the effects of glucose level, age, and creatinine levels on mortality were significant.
Conclusion
In our study, mortality was higher in insulin users. However, when confounding factors were adjusted, the insulin's effect on the mortality rate was disappeared. PAIU is neutral for COVID-19 mortality.

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D11

Original Research, ePoster

Weight gain in gestational diabetes: is there any association with obstetric and perinatal complications?

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Background
The effect of maternal weight gain in obstetric and perinatal morbidity in pregnant with gestational diabetes (GD) is not established.

Objectives
Evaluation of the impact of weight gain in obstetric and perinatal outcomes in women with GD.
Methods
Retrospective study of women with GD between January/2020-March/2021. Weight gain in pregnancy was evaluated by 2009 IOM recommendations, women were divided in 3 groups: excessive weight gain (EWG), adequate weight gain (AWG) and insufficient weight gain (IWG).
Results
Included 63 women (mean age 34.22±35 years; 39.7% with 1st trimester(T) and 39.7% with 2nd T GD). There was AWG in 23.8%, IWG in 36.5% and EWG in 39.7%. In IWG group, women' mean weight gain in pregnancy was 4.59±3.71g and the mean HbA1C in 3rd T was 5.29±0.26%. These women were treated for DG with: diet (10), insulin (1), metformin (9) and with metformin + insulin (3). Within AWG group, the mean weight gain in pregnancy was 10,95±2.31g and the mean HbA1C in the 3rd T was 5.45±0.38%. DG treatment options in this group were: diet (9), metformin (5) and metformin + insulin (1). Regarding EWG group, the mean weight gain was 13.9±4.56g and the mean HbA1C in 3rd T was 5.46±0.40%. Considering perinatal outcomes, all macrosomic babies ($n=4$) were born from women with EWG ($P=0.045$). There were 5 large for gestational age (LGA) babies (4 from EWG and 1 from AWG mothers) and 1 small for gestational age (SGA) (from an IWG mother - $P=0.049$). The majority of babies with neonatal jaundice and hypoglycaemia were born from mothers with IWG. Regarding obstetric outcomes, EWG women had higher odds of caesarean section [OR=2.1 95CI(0.46-9.64)]. Preterm delivery rates were similar in all groups ($P=0.4$), however AWG group had more full-term deliveries.
Conclusions
In pregnant with GD, EWG was associated with more cases of macrosomic and LGA babies and caesarean section. AWG appear to be related with full-term deliveries and EWG with higher mean values of HbA1C.

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D12

Original Research, Oral presentation
Sex differences in quality of life and sexual function in type 2 diabetes mellitus: results from the RECOGITO trial

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Background
Type 2 diabetes mellitus (T2DM) significantly impacts Health-Related Quality of Life (HRQoL) and sexual function. The aim of this study was to evaluate sex differences in HRQoL and sexual function in patients with T2DM.
Methods
We performed an ancillary study of RECOGITO trial (REmodelling in Diabetic CardiOmyopathy: Gender Response to PDE5i InhibiTOrs - NCT01803828). All patients completed the 36-item-Short-Form Health Survey (SF-36), assessing 8 domains: physical functioning (PF), physical role limitations (RP), emotional role limitations (RE), vitality (VT), mental health (MH), social functioning (SF), bodily pain (BP) and general health (GH). The Female Sexual Function Index (FSFI), assessing 6 domains (desire, arousal, lubrification, orgasm, satisfaction, pain), and International Index of Erectile Function (IIEF-5) questionnaires were administrated to females and males, respectively. An independent sample t-test was used to evaluate sex-differences within our cohort. SF-36 and FSFI scores were compared with reference age and sex-matched cohorts.
Results
Within our cohort of 109 patients (55 men and 54 women), SF-36 results showed worse RP, RE, VT and BP in women compared to men ($P<0.05$), even correcting for age, duration or metabolic control of diabetes. When stratified for age, our women showed worse RE ($P=0.05$) than women without T2DM. No differences were found in men. In our cohort, 45 women (84%) showed a total score compatible with female sexual dysfunction with lower scores in the domains of sexual arousal, lubrification, satisfaction and pain when compared with post-menopausal women without T2DM ($P<0.05$). 42 men (76%) showed ED at IIEF-5.
Conclusion
In our cohort of 109 patients with T2DM, women had poorer HRQoL than men and worse RE and sexual function when compared to reference age-matched women. Although this study confirmed the high prevalence of ED in men with T2DM, this is not reflected in a worsening of HRQoL.

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D13

Original Research, Oral presentation
Does diabetes and poor glycemic control increase the severity and mortality in patients with COVID-19?

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Background and Aims
Diabetes is often associated with an increased severity and mortality in COVID-19 patients. Possible mechanisms include hyperglycemia-induced impaired immune response, characterized by a state of chronic low-grade inflammation. Objectives: evaluate if diabetes and glycemic control were related to the severity of disease and mortality in hospitalized COVID-19 patients.
Methods
We conducted a retrospective case control study that included 224 patients hospitalized with COVID-19 in our center between March 2020 and February 2021. We randomly selected 112 diabetic patients in the study group and 112 non-diabetic patients in the control group. Primary endpoints were admission to the intensive care unit(ICU), need for mechanical invasive ventilation(MIV) and in-hospital death.
Results
We evaluated 224 patients, 50.4% female, with a mean age 72.1 years. Among patients with diabetes, 93.8% were type 2 and 6.2% were type 1. In-hospital death occurred in 18.3%. A higher proportion of diabetic patients (vs patients without diabetes) was admitted to the ICU (24% vs 17%, respectively, $P=0.355$), required MIV (37.1% vs 23.2%, $P=0.105$), and died (15.9% vs 7.9%, $P=0.226$). A subgroup analysis within diabetic patients, showed that patients with poor primary outcomes had higher HbA1c levels, namely ICU admission (8.3% vs 7.6%, $P=0.03$), MIV (8.6% vs 7.6%, $P=0.02$) and death (8.9 vs 7.6%, $P=0.001$). Considering the primary outcomes, older age ($P=0.001$) and hypertension ($P=0.02$) were associated with death, and obesity was associated with MIV ($P=0.008$). In multivariable analysis, HbA1c was an independent prognostic factor of mortality (OR 1.6, 95% CI:1.2-2.3, $P=0.003$), ICU admission (OR 1.3, 95% CI:1.1-1.7, $P=0.04$) and MIV (OR 1.4, 95% CI:1.1-1.9, $P=0.02$) in diabetic patients.
Conclusions
In this study, higher HbA1c in diabetic COVID-19 patients were associated with worse outcomes. Advancing age, hypertension and obesity were also found to be important predictors of poor outcome in COVID-19 patients.

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D14

Original Research, ePoster
Structure of mortality among patients with diabetes mellitus in the republic of Uzbekistan during COVID-19 pandemia

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Background
The COVID-19 pandemic has caused enormous damage to all countries of the world. Patients with diabetes mellitus are a separate risk group for the consequences of COVID-19, both in the acute and in the long-term period.
Aim
To study change in the structure of mortality among patients with diabetes in the Republic of Uzbekistan during the COVID-19 pandemic.
Materials and Methods
We analyzed the data of the report forms of endocrinological dispensaries for reasons of deaths registered among patients with type 2 diabetes mellitus in 2020 and compared these indicators with the data of 2019.
Results
In 2020, mortality among patients with diabetes increased 1.5 times compared to 2019 and was 4.3% (compared to 2.8% in 2019). Among the causes of deaths, cardiovascular accidents prevailed: 57.9% in 2020 (48.0% in 2019), cerebrovascular accidents (15.6% in 2020 and 24.2% in 2019), chronic kidney disease (12.0% and 15.1%), gangrene, sepsis (1.2% and 1.8%), the frequency of hyper- and hypoglycemic comas as causes of death was 0.4% and 0.2%, respectively, both in 2019 and in 2020, however, the absolute number increased in 2020. Among the "other" causes of death (12.8% in 2020 and 10.2% in 2019), COVID-19 itself was 53%, pneumonia 17%, pulmonary embolism 1%, oncological diseases 12%, liver cirrhosis 12%.

Conclusions
Despite the fact that COVID-19 caused deaths in 2.9% of patients with diabetes, the COVID-19 pandemic caused a significant increase in mortality - 1.5 times - among patients with diabetes, mainly due to acute cardiovascular accidents, stroke, as well as accelerating the progression of chronic complications of diabetes, in particular chronic kidney disease.

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D15

Original Research, Oral presentation

Impact of ambulatory glucose profile on HbA1C and dietary habits amongst patient in central india

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Background
Nutritional interventions are required for effective management of diabetes Mellitus. Dietary recommendations act as a major intervention for treatment of DM and obesity. It is recommended that the diet should be individually adapted to personal choices and metabolic goals. With advent of technology newer monitoring tools like continuous glucose monitoring systems (CGM) are now finding their way into Diabetes management and nutrition therapy. The ambulatory glucose profile (AGP) acts as a major tool in managing the dietary intake and thus help our diabetic patients in modifying their diet and blood sugar control.
Method
60 patients, (15–65 years) with T1DM and T2DM were randomly allocated to two groups of 30 persons each. In first group blood sugar measurement was carried out via AGP done by Abbott Libre Pro device for 14 days and other group was on routine blood sugar monitoring technique of SMBG. The patients were asked to modify their diet based on AGP and SMBG readings in respective groups. The participants were monitored for HBA1C at 3 month and surveyed for changes in dietary patterns adjudged by a questionnaire at 3 months.
Result
HBA1C reduction in AGP group was 2.2 % as compared to 1% in SMBG group. Number of patients achieving target goal of 7 % HBA1C was better in AGP group (82 %) as compared to Non AGP group (54%). 72 % patient in AGP group stopped inter-meal snacking as compared to 38 % in Non AGP group. In AGP group 82 % have accepted to adopt to better food choices as compared to 32 % in Non AGP group.
Conclusion
AGP has a profound effect on the dietary modification of the patients. Dietary counselling if based on AGP readings can result in adopting better dietary choices and better sugar control. The use of AGP should be promoted by Health care professionals. Novel ways should be adopted to bring AGP cost to a level where this newer technology is affordable to many and hence a large proportion of population can be benefitted.

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D16

Case Report, ePoster

Hyperosmolar hyperglycaemic state (HHS) in type 1 and type 2 diabetes induced by asymptomatic SARS-CoV-2 infection: 2 case reports

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HHS is a rare hyperglycaemic emergency, typically precipitated by infection in people with T2DM. There are few recorded cases of COVID induced pure HHS. We hereby report 2 further cases, including the first known reported case in a person with T1DM.
Case 1
81yo male with T1DM (on glargine and aspart insulin, HbA1c 57 mmol/mol) presented with lethargy, general deterioration and a fall. There were no new symptoms of fever/cough/breathlessness or change in taste/smell. Investigations showed Glucose 34.9 mmol/l, Ur18.3, Cr96, Na135, K4.5, S. Osm 323.2, pH7.48, HCO3 27.6, blood ketones 0.3 mmol/l. COVID PCR positive. CXR - no COVID changes. He was diagnosed with HHS and treated with IV fluids and IV insulin with clinical and biochemical improvement.
Case 2
91yo female with T2DM (no anti-hyperglycaemic medication – metformin and linagliptin discontinued during an inpatient spell 5 months earlier with normal blood sugars), IHD and dementia was admitted with polyuria/polydipsia. No symptoms of cough/SOB/fever or change in taste/smell. Investigations showed Glucose 38.4, Ur14.4, Cr132, Na134, K5.3, S. Osm320.8, HbA1c130, pH7.39, HCO3 28.5, blood ketones 0.7. COVID PCR positive. CXR - no COVID changes. She was treated with IVF and IV Insulin with rapid biochemical improvement, and discharged home with metformin, linagliptin and gliclazide.
Discussion
Despite the COVID pandemic affecting over 173,000,000 people worldwide to date, the incidence of HHS remains very low and limited to a few case reports. We have added to the knowledge base with 2 additional reports, including, to our knowledge, the first report in a patient with T1DM. Given that these cases were asymptomatic from a COVID perspective, we recommend that COVID is considered as a precipitant for all patients with hyperglycaemic emergencies without an alternative cause. The forthcoming CoviDiab study, and others, will shed further light into the interplay between COVID and hyperglycaemic emergencies.

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D17

Original Research, ePoster

Efficiency of glucocorticosteroids in combination with biological therapy in patients with type 2 diabetes mellitus and new coronavirus infection

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Aim
To evaluate the efficiency of glucocorticosteroids (GCS) in combination with biological therapy in the treatment of COVID-19 in patients with type 2 diabetes mellitus (T2D).
Materials and methods
A retrospective study of hospitalized patients with a PCR-confirmed diagnosis of COVID-19 with T2D was conducted ($n=179$). Patients received standard therapy, including biological preparations. The first group consisted of participants who received GCS ($n=46$), the second group – patients without GCS ($n=133$). The groups are comparable by sex, age, in severity, of the degree of lung damage according to computed tomography (CT), of the presence of concomitant diseases.
Results
The number of patients transferred to the intensive care unit in the first group was 30.8%, in the second – 19.6% ($P=0.142$), requiring a mechanical ventilation – 20.3% and 13.0%, respectively ($P=0.378$). The proportion of deaths in the first group was 17.4% and in the second – 16.5% ($P=1.0$), the duration of hospital stay was 13 and 11 days, respectively ($P=0.001$). The median FPG on 7th day in the first group was 8.3 mmol/l, in the second – 7.6 mmol/l ($P=0.858$). The improvement according to CT data in the first group was 10.9%, in the second – 16.5% ($P=0.475$), the weighting was 21.7% and 24.8%, respectively ($P=0.674$). The level of C-reactive protein in the first group on the 7th day decreased by 52.3 mg/l and in the second by 35.7 mg/l ($P=0.110$) , lactate dehydrogenase increased by 44.7 U/l in the first group and decreased by 18.9 U/l in the second ($P=0.743$), the content of fibrinogen decreased by 1.7 and 2.5 g/l, respectively ($P=0.231$), the level of D-dimer didn't change ($P=0.996$).
Conclusions
The addition of GCS to biological therapy didn't affect the outcomes of COVID-19 in patients with T2D, didn't contribute to a more effective relief of the inflammatory syndrome and a decrease in the degree of lung tissue damage, but prolonged the duration of hospitalization.

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D18

Original Research, ePoster

Cognitive impairment in elderly patients with type 2 diabetes mellitus

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Background
Screening for cognitive impairment (CI) that is strongly recommended in elderly with diabetes mellitus (DM) type 2 but in fact is not commonly fulfilled.
Objectives
To evaluate cognitive state in elderly patients with type 2 diabetes mellitus.
Methods
In this cross-sectional study all patients with DM type 2 in age 65 and older who were on a planned admission in endocrinology department University Hospital named after V. Vasilenko were included except those with previous diagnosed dementia and vision or hearing loss. All participants underwent standard examination according national guidelines for DM (2019) and battery of neurocognitive tests: Mini-Mental State Examination (MMSE: 28-30 score normal cognition, 25-27 score mild CI, ≤24 score severe CI), Russian version of 12-word Philadelphia verbal learning test (PVLT: normal cognition ≥20 score), clock drawing test (severe praxis impairment <8 score), trail Making Test (TMT-A: >90 sec severe bradyphrenia), Frontal Assessment Battery (FAB: 16-18 score normal cognition, 12-15 score mild frontal disorder, <12 score severe CI). Data processed in IBM SPSS Statistics 26.
Results
Between November 2019 and April 2021 we enrolled 217 patients in age 72 [68-77] years. Most of them were retired (87%) woman (72%) with a higher education (53%) . Mean DM duration was 13 [8-20] years. Average HbA1c was 9.2% [8.2-10.1]. Every third patient mentioned at least one hypoglycemia over the year. Stroke history had 13.4%. Complain of memory loss had 70% participants. MMSE found out 33.5% prevalence of mild CI and 9.7% prevalence of severe CI. PVLT showed memory impairment as common as 74%. Severe bradyphrenia was found in 19.4% of patient, severe praxis impairment in 29%. Mild frontal disorder was found in 32% while 7% of patients had severe.
Conclusions
Elderly with DM type 2 have wide range of CI that may affect self-management and therapeutic education efficacy and compliance and so cognitive screening should be performed routinely.

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D19

Case Report, ePoster
An usual case of hypoglycaemia
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A 69-year-old non-diabetic woman presented with 1 month of recurrent drowsiness and confusion secondary to hypoglycaemia, nocturnal and on fasting. On admission her CBG was 2.6 mmol/l, confirmed venously. Her history was of a large solitary fibrous tumour (SFT) of the chest wall first resected in 2011 with recurrent relapses requiring surgery in 2016 and 2017. Histology showed typical features of SFT. Despite palliative chemo-radiotherapy for a further relapses, there was progression. By December 2020, disease was within the pleura with paratracheal deposits and a poor predicted prognosis. A normal short synacthen test ruled out adrenal insufficiency. Insulin (12 pmol/l) and C-peptide (<94 pmol/l) levels were appropriate for the level of hypoglycaemia (2.5 mmol/l). Overnight enteral feeding was started, given the burden of nocturnal hypoglycaemia, which improved on discharge. However, she was re-admitted 2 months later with severe daytime hypoglycaemia and a paraneoplastic cause was sought. Insulin-like Growth factor I (IGF-I) levels (6.3 nmol/l) and IGF-II levels (149 nmol/l) with an IGF-I: IGF-II ratio of 23.7 (normal <10) were consistent with a diagnosis of non-islet cell tumour hypoglycaemia, i.e. Doeger-Potter syndrome. This is a paraneoplastic syndrome characterised by ectopic secretion of IGF-II from a SFT leading to hypoinsulinaemic hypoglycaemia. Histologically proven SFT, hypoglycaemia excluding other causes and raised IGF-II:I ratio met the criteria for diagnosis. We started 40 mg prednisolone daily with resolution of hypoglycaemia. We then introduced growth hormone (GH) (somatotropin 0.4 mg) once daily and slowly titrated up to maximum tolerated dose and the steroid weaned down. The result has been excellent with no hypoglycaemic events since discharge 1 month ago. Doeger-Potter syndrome is rare cause of hypoglycaemia but speedy diagnosis and effective steroid and GH treatment have allowed our patient to spend valuable time with family in this terminal period.

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D20

Original Research, ePoster
Impact of regular tele-consultation on drug compliance, patient follow-ups and HbA1c values in diabetic patients of central india
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Background
There is an increased burden on the healthcare system worldwide due to the ongoing pandemic of Covid-19. Moreover, there is a surge in the number of patients who are waiting for their routine follow up treatment for chronic disorders. Good metabolic control is important in type 2 diabetes mellitus to improve quality of life, life expectancy and disease outcomes.
Aim
To see the impact of the tele-consultation on drug compliance , patient follow-ups and HbA1C values in Diabetic patients of central India.
Method
Randomised control design was used, 236 patients with type 2 diabetes mellitus allocated from October 2020- April 2021 were randomized to either treatment at home by video tele consultation only or standard in clinic OPD treatment. Primary outcomes measured were HbA1c target (7%) and drug compliance (Measured by self-reported questionnaire) and follow-up accuracy after six months of randomisation. Results were analysed using statistical analysis.
Results
This study showed better drug compliance (Taking >90% of the medicine in time) in tele consultation group 91 % vs 76 % in OPD group. 126 consultations were missed in the standard in clinic OPD group and 19 in the teleconsultation group. Tele consultation group showed better HBA1C reduction 2.6 % (baseline mean = 9.8 %) vs OPD group 1.2 % (baseline mean = 9.6%), also a greater number of patients 64 % achieved target HbA1c goal of 7 % in teleconsultation group vs 34 % in OPD group.
Conclusion
Telemedicine based consultation has shown better results in this study in terms of drug compliance and patient follow-up which are integral to better diabetes control and preventing future complications. More awareness regarding this mode of healthcare delivery should be promoted.

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D21

Original Research, ePoster
Digital evaluation of ketosis and other diabetes emergencies (DEKODE) : Automated auditing system for diabetic ketoacidosis management may help provide real-time instant feedback on performance
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Introduction
Effective management of diabetic ketoacidosis (DKA) improves clinical outcomes. We created an automated auditing system, Digital evaluation of ketosis and other diabetes emergencies (DEKODE), which identifies DKA episodes based on fixed-rate intravenous insulin infusion (FRIII) prescription.
Aim
We validated DEKODE for its ability to audit DKA management against manually collected data.
Methods
All episodes identified by DEKODE from September 2018 to August 2019 was compared with manually confirmed DKA episodes from the same duration. Duration of DKA, appropriateness of glucose and ketone measurements during entire DKA duration and fluids prescribed in the first 12 hours of diagnosis were compared between the two datasets. The difference between manual and automated data were analysed using Prism v6.0 (Graphpad Inc) and results are presented as mean and standard error of mean (SEM). The difference in frequencies of hypokalemia and hyperkalemia between manual and automated data was analysed by chi-square test.
Results
150 episodes were identified by DEKODE. Of these, 147 had manually confirmed DKA. There was no significant difference in DKA duration between DEKODE and manual data (16.0 ± 1.0 hours; 17.5 ± 0.9 hours; P = ns) respectively. There was no difference in FRIII appropriateness (98.3% ±1.2%; 97.9% ± 1.1%; P = ns), glucose (98.5% ± 2.6%; 105.6% ± 2.5%; P = ns) and ketone measurements (43.3% ± 2.1%; 47.1% ± 2.2%; P = ns) between the two systems. DEKODE

accurately predicted the frequency of hyperkalaemia (7/147; 6/150; P=ns) and hypokalaemia (9/147; 9/147; P=ns). However, DEKODE over-predicted proportion of fluids prescribed (96.9% ± 3.2%; 84.4% ± 3.1%; P=0.0047).
Conclusion
DEKODE reliably predicts DKA duration and management, which could help reduce time from data collection to analysis, thus providing real-time performance results.

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D22

Case Report, ePoster
The combination of type 1 diabetes and eating disorder during pregnancy

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Background
The problem of eating disorders currently holds a special place in clinical practice. Bulimia nervosa is one of the main forms of eating disorders, characterized by difficulty in treatment, a long, recurrent course. Eating disorders are common in patients with type 1 diabetes mellitus (T1D), especially in adolescent girls.
Case Presentation
In this article, we present a clinical case of a 29-year-old patient with T1D for 14 years and bulimia nervosa, which developed before the manifestation of T1D and progressed against its background. The patient is overly concerned with controlling body weight, specifically restricted the intake of carbohydrates, forcibly caused vomiting. During pregnancy fasting ketonuria ("low-carb ketone") was repeatedly detected. The minimum weight was 37 kg (BMI 15.2 kg/m^2). Particular interest of this case is the course of pregnancy, which ended in antenatal death. The possible cause could be the restriction on carbohydrate food and prolonged stay in ketosis, that might lead to the development of pregnancy pathology. Additional examination also revealed multiple complications of diabetes and recurrent depressive disorder.
Conclusion
Combination of T1D and eating disorder requires conjoint monitoring by an endocrinologist and a psychiatrist and should be considered as a atypical course of the disease.

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D23

Original Research, ePoster
2020 Zagreb earthquake and type 1 diabetes management - A pilot study

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Background
In March 2020, at the beginning of the first COVID-19 lockdown, Zagreb (Croatia) was hit by a strong earthquake after more than 100 years. Restrictive epidemiological measures affected people's lifestyles, and the earthquake was an additional traumatic event.
Objectives
Determine whether the earthquakes and the lockdown affected glycaemic control in type 1 diabetes patients using flash glucose monitoring (FGM).
Methods
This study enrolled 28 type 1 diabetes patients and 21 of them experienced the earthquake. A questionnaire about diabetes management at this time was conducted. FGM (FreeStyle Libre) data were collected in the three two-week periods: (1) before the lockdown and the earthquake, (2) after the earthquake, at a beginning of the lockdown, (3) eight weeks after the earthquake, at the end of the lockdown. We analyzed the average glucose level, glucose management indicator, active FGM time, time in range, time below range, time above range and coefficient of variation in the whole cohort of patients and separately in those that experienced the earthquake.
Results
Among patients that experienced the earthquake, 53% answered that nothing changed in their diabetes management in the days after the event, 23% estimated that with more efforts they kept the control and 12% reported difficulties in diabetes management. 24% of those patients increased their insulin doses. In the same sample of patients, the time above range decreased after the earthquake in comparison to the previous period (P=0.03) while lower active FGM time was of borderline significance (P=0.07). In the rest of our analysis no changes in FGM metrics between periods were found.
Conclusion
In this small pilot study we did not find that Zagreb earthquake affected disease management of type 1 diabetes patients stronger than the everyday life challenges they are faced with, but each patient should be approached individually.

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D24

Original Research, Oral presentation
Sex-specific cardioprotection of daily tadalafil in patients with type-2 diabetes. The RECOGITO, randomized, double-blind, placebo-controlled trial

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Background
Cyclic GMP-phosphodiesterase type 5(PDE5) inhibition was shown to counteract maladaptive cardiac changes triggered by diabetes in some, but not all studies.
Objective
To assess sex differences in cardiac remodeling after PDE5 inhibition in patients with diabetic cardiomyopathy.
Methods
20-week, double-blind, randomized, placebo-controlled trial (NCT01803828). 220 men and women (45-80 years) with long-duration (>3 years) and well-controlled T2DM (HbA1c<86 mmol/mol) were screened. 122 were selected according to echocardiographic signs of cardiac remodeling: interventricular septum ≥11 mm in men, ≥10 mm in women, or diastolic dysfunction (E/A<1 or E/e'>10 at PW and tissue Doppler). Patients were randomly assigned(1:1) to placebo(n=61) or oral tadalafil (n=61) 20 mg once daily. Primary outcome: sex-difference in cardiac torsion change, from baseline to 20 weeks. Secondary outcomes: changes in cardiovascular, metabolic, immune and renal function.
Results
At 20 weeks, the treatment-by-sex interaction documented an improvement in cardiac torsion(-3.40°,-5.96;-0.84,=0.011) and fiber shortening(-1.19%,-2.24;-0.14, P=0.027), in men but not women. Hsa-miR-199-5p, biomarker of cardiovascular remodeling, improved accordingly(-3.53copies/μLx105,-6.39;-0.67, P=0.02). In men and women, tadalafil improved albuminuria(-237.58 mg/24h,-466.12;-9.04, P=0.04), renal artery's resistive index(-3.96%,-7.60;-0.32, P=0.03) and circulating Klotho(39.22 pg/ml,18.31;60.13, P<.001), biomarker linked to cardio-renal health. Immune cell profiling revealed low-grade chronic inflammation improvement: classic CD14++CD16- monocytes(–159 cells/μl,–245;–72, P<0.001), Tie2-expressing monocytes(19 cells/μL, 12;25, P<0.001).
Conclusions
Continuous PDE5 inhibition could represent a new treatment strategy to target cardiac and renal complications of T2DM, with a different sex- and tissue-specific response. Klotho and hsa-miR-199-5p appear as novel players for cardio-renal T2DM complications.

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D25

Original Research, ePoster
Establishing a common DKA registry in the United Kingdom: Initial results

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Background
Diabetic ketoacidosis (DKA) is the most common acute endocrine complication needing hospital admission. Morbidity and mortality resulting from DKA are largely preventable if we can identify and act on gaps in management in relation to current guidelines.
Objectives
To establish a common DKA registry to identify gaps in management and share best practices across centres.
Methods
All people admitted with DKA at four hospitals in the UK (named A, B, C, D for anonymity) from 1st January 2020 to 31st December 2020 were included in the study. Pseudonymised data was collected using a Google form. Comparison between hospitals was performed using the Independent-Samples Kruskal-Wallis Test.
Results
A total 341 DKA episodes were included (A-76, B-152, C-49 and D-64). Results are presented In comparison to recommendations by the Joint British Diabetes Societies Inpatient Care Group. There was no difference in administering fluids (A- median: 100.0%, B- 87.5%, C- 93.8%, D- 93.8%) and fixed-rate intravenous insulin infusion (A- 100.0%, B- 99.5, C- 100.0%, D- 96.0%) between the four hospitals. However, there were differences in glucose (A- 77.5%, B- 117.9%, C- 76.1%, D- 123.4%) and ketone monitoring (A- 10.0%, B- 56.2%, C- 10.5% , D- 14.0%). DKA duration was lower in Hospital B (A- 18.5 h, B: 11.1 h, C- 20.8 h, D- 15.0 h). However, there was no difference in the length of stay for people admitted with DKA (A- 2.9 days, B- 3.5 days, C- 3.9 days, D- 2.9 days).
Conclusion
Overall, all included hospitals have similar performance in most parameters. Certain good practices such as better glucose and ketone monitoring and reduced DKA duration were identified. We are currently meeting the stakeholders to share the results and good practices in order to make improvements and provide the best possible and uniform care for people with DKA.

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M01

Original Research, ePoster
Effect of perinatal nutritional patterns on skeletal properties in adult Wistar rat offspring

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Objectives
This study aimed to assess the results of different perinatal nutritional patterns on skeletal development and insulin regulation of one-year-old Wistar rats.
Methods
Three different diet regiments [Control Diet, (CD), food-restricted (FR), or fat-fed (FF)] were randomly provided to sixty-seven primigravid rats from the 12th till the 21st gestational date when they gave birth and throughout the 25-day lactation period. According to their birth weight, offspring of FR-mothers were classified as fetal growth restricted (FGR) and non-FGR. After delivery, all pups were lactated by foster mothers receiving either the same or a different diet regiment than the birth mother. Weaning to the foster mother diet scheme occurred 26 days postpartum and that regiment was followed throughout the first year of life. One-year-old offspring's skeletal characteristics were assessed using peripheral quantitative computed tomography and plasma insulin levels were measured.
Results
Total bone density and total/subcortical area were lower in FF/FF vs. CD/CD rats. From the group born to FF-mothers, those who were subsequently fat-fed (FF/FF) presented higher subcortical density in comparison to those who were subsequently food-restricted (FF/FR). Values of all measured skeletal characteristics were lower in FGR/CD vs CD/CD rats. Within the non-FGR group, postnatal high-fat diet was associated with higher values in all skeletal properties compared to food restriction. Insulin levels were higher in FGR/FF than in FF/FR rats. Postnatally FF rats had similar insulin levels, regardless of being born to an FR or FF mother.
Conclusions
Skeletal development and insulin production is associated with pre- and postnatal nutritional patterns.

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M02

Case Report, ePoster
Unmasking of subclinical sarcoidosis due to cholecalciferol overdose: A case report

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Background
Hypercalcemia is not uncommon in granulomatous disorders, especially sarcoidosis and tuberculosis. Prevalence in sarcoidosis may be 2-63%, depending on the population studied. Uncontrolled synthesis of 1,25-dihydroxyvitamin-D by the macrophages is the underlying mechanism. Here we present a case of hypercalcemia, initially thought to be due to hypervitaminosis-D but later diagnosed to have sarcoidosis.
Case Presentation
This 49-year-old gentleman presented to the casualty in Nov 2019 with symptoms of 3 days duration suggestive of hypercalcemia. There was recent history of consumption of 60,000 units/day of cholecalciferol for 1 week. He did not have history of fever, unintentional weight loss, cough or kidney stones. The corrected serum calcium was 15 mg/dl, creatinine 3.1 mg/dl, parathyroid hormone 4.5 pg/ml and 25-hydroxyvitamin-D 69.5 ng/ml.A probable diagnosis of vitamin-D toxicity was made. He was treated for hypercalcemia as per standard of care and intravenous hydrocortisone was given. His serum calcium normalised and was discharged on oral prednisolone of 20 mg/day tapered over 1 month. In Nov 2020, patient presented with high normal calcium with normal vitamin-D levels. Serum ACE was found to be 154.38 U/l. CT Chest and USG abdomen revealed multiple nodules in lungs, spleen and liver with mediastinal lymphadenopathy and bilateral nephropathic changes. PET-CT revealed multiple enlarged metabolically active lymph nodes in chest and abdomen. Lung parenchymal biopsy and immunohistochemistry confirmed sarcoidosis. He was started on 60 mg of oral prednisolone gradually tapered to 10 mg/day. Serum calcium has become normal with improvement of renal function.
Conclusions
In this case, occult sarcoidosis with high normal serum calcium deteriorated to severe, symptomatic hypercalcemia because of cholecalciferol overdose. Follow up with normalization of serum 25-hydroxyvitamin-D and regular monitoring of serum calcium led to the detection of subclinical sarcoidosis.

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M03

Case Report, ePoster
Management of a rare life-threatening parathyroid carcinoma

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Background
Parathyroid carcinoma (PC) is rare, usually presenting with hyperparathyroidism and severe hypercalcemia. A standardized diagnostic, prognostic and therapeutic approach has not been provided yet and TNM staging algorithm is not universally accepted. Surgery is the first-choice treatment and is the only effective therapy to control hypercalcaemia. Chemo- or radio-therapy, local treatments or novel drugs should be reserved to selected cases.
Case Presentation
A 63-year-old man complained of progressive fatigue, abdominal pain and weight loss. Blood exams showed: calcium 15.6 mg/dl, PTH 1250 pg/ml, phosphorus 1.2 mg/dl. Profuse hydration, diuretics and zolendronate 4 mg once were given. A CT scan showed pancreatitis, portal thrombosis; kidney stones; multiple osteolytic lesions (brown tumours at histology). Neck ultrasound found a 39 mm round hypoechoic nodule posterior to the left inferior thyroid lobe, confirmed to be a parathyroid gland by MIBI scan. Heparin and antibiotics were given to contrast thrombosis and the infectious risk associated to pancreatitis. Parathyroid surgery was performed, including en bloc resection of left thyroid lobe. Histology documented a PC. Thyroid lobe was infiltrated, while cervical lymph nodes were not involved (pT2, N0 TNM/AJCC 8TH). After surgery, intraoperative PTH values dropped and calcium progressively normalized. During multidisciplinary discussion active surveillance was suggested, based on neck ultra-sound and biochemical evaluation, reserving further treatment in case of recurrence of disease. Six months after surgery there is no evidence of the disease.
Conclusions
We reported an unusual case of PC, associated with life-threatening hypercalcemia, pancreatitis, portal thrombosis, nephrolithiasis and brown tumours. The management of PC is very challenging. Multidisciplinary approach results pivotal and further studies will be needed to define a standardized treatment program for parathyroid cancer.

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M04

Original Research, ePoster

The elderly patients with very high dose vitamin D level: Often present with normocalcemia

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Objective
We aimed to determine the risk of hypercalcemia in a geriatric population with very high dose levels of 25-hydroxy-vitamin D (25(OH)D)
Patients and Method
This study was designed as a retrospective, cross-sectional two-center study for examining the elderly patients with very high 25(OH)D levels (>88ng/ml) between January 2014 and December 2019. After recruitment, subgroup analyses of the patients were performed based on their calcium and vitamin D levels.
Results
A total of 81.101 elderly patients who had been evaluated for their vitamin D levels, were screened. Of the 458 (0,6%) elderly patients with (25(OH)D>88 ng/ml according to our criteria, 217 patients with complete data were accepted into our study. The median 25(OH)D level was 103.7ng/ml (min-max:88.2-275.9). Most of the elderly patients (86.6%) with very high 25(OH)D levels were normocalcemic. When patients with hypercalcemia were compared with normocalcemic group; no difference was observed in the levels of 25(OH)D, intact parathormone (iPTH), phosphorus, alkaline phosphatase (ALP), and their age. However, the PTH suppression rate was significantly higher in hypercalcemic group ($P=0.005$).
Conclusion
The elderly patients with very high 25(OH)D levels would appear to be mostly normocalcemic whereas life-threatening hypercalcemia would also occur. Treatment and follow-up planning should be done according to the clinical guideline recommendations.

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M05

Case Report, ePoster

A case report of bisphosphonate induced osteonecrosis of jaw

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Introduction
Bisphosphonates are widely used to treat osteoporosis, hypercalcemia of malignancy and multiple myeloma. Albeit rare, bisphosphonate induced osteonecrosis of jaw is serious adverse event which significantly affects quality of life. Clinical presentation includes gingival ulceration, exposed necrotic bone in the oral cavity. In severe cases it may cause spontaneous pain, tooth mobility and pathological fractures.
Case Report
A 70-year-old man, on treatment for multiple myeloma for past 10 years, presented with loosening of teeth in right fourth quarter of mandible associated with pain and purulent discharge. He had type 2 diabetes and hypothyroidism. He was on thalidomide, monthly dexamethasone as part of his chemotherapy. On examination there was a soft nodular swelling in right inferior border of mandible. Intra oral examination revealed instability of right mandibular body with sequestration and pus collection. Cone beam computed tomography revealed four missing teeth in right lower quadrant (Teeth 44,45,46,47), loss of alveolar bone, osteomyelitis and pathological fracture of right body of mandible. Histopathological examination revealed necrosis of bone and plasma cells. He was treated with intravenous antibiotics. Sequestrectomy and reconstruction with Recon plates was done in view of osteomyelitis.
Conclusion
Osteonecrosis of jaw is a rare but serious complication of bisphosphonate therapy. To prevent this known complication a comprehensive, meticulous dental evaluation should be performed prior initiating bisphosphonate therapy. Patients should be educated about the importance of oral hygiene to reduce the risk of osteonecrosis of jaw. We should be highly vigilant in patients with multiple myeloma, where use of steroids as chemotherapy can be an additional risk factor.

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M06

Case Report, Oral presentation

Osteogenesis imperfecta- A novel pathogenic variant

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Background
Osteogenesis imperfecta is a systemic connective tissue disorder characterized by low bone mass and bone fragility leading to low-trauma fractures or fractures in atypical locations. Extraskeletal manifestations may include dental anomalies, blue-gray sclera, hearing loss, joint hypermobility, muscle weakness, cardiovascular and pulmonary complications.
Case presentation
A 7year old boy presented with a history of fracture right femur 1 month ago after a trivial trauma. He sustained fracture of right femur 3 times in the past. There was no history of renal calculi. Family history was non-contributory. On examination, he had bowing of legs. His height was 121.5 cm (+0.8 standard deviation), arm span was 126 cm, Upper to lower segment ratio was 0.97. Tanner's staging was prepubertal. Investigations revealed serum calcium 9.7 mg/dl, phosphorus 4.5 mg/dl, 25(OH)vitamin D3 15.2 ng/ml, Alkaline phosphatase 80 IU/l. Renal, liver, thyroid functions were normal. urine pH 6.5. He underwent open reduction and internal fixation. Vitamin D replacement was initiated as he had vitamin D deficiency. Gene panel testing for osteogenesis imperfecta was done as there was a strong clinical suspicion. A heterozygous missense variant c.2764G>C (p. Gly922Arg) in exon 42 of the COL1A2 gene was detected. Functional studies haven't been carried out yet due to financial constraints. Patient is being followed up for progress and treated with bisphosphonates to prevent further fractures.
Conclusion
With the advances in next-generation sequencing technology and its wide availability, novel pathogenic variants in established osteogenesis imperfecta genes and new genes are being identified. According to literature review, this mutation is novel and is being reported for the first time. Clinical features are mostly suggestive of osteogenesis imperfecta type 4. In cases of recurrent fracture with strong clinical suspicion, genetic analysis helps in diagnosing osteogenesis

imperfecta. Genetic confirmation helps in further management, fracture prevention and counseling the family members.

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M07

Case Report, ePoster

Familial hypocalciuric hypercalcaemia or primary hyperparathyroidism?

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Background
Primary hyperparathyroidism is the commonest cause of hypercalcemia. Current guidelines advise to rule out familial hypocalciuric hypercalcemia (FHH) when evaluating hypercalcemia. It is widely considered that FHH is associated with low urine calcium creatinine clearance ratio (CCCR). However, low CCCR can also occur in Primary hyperparathyroidism.
Case
A 30 years lady presented with hypercalcemia and high parathyroid hormone (PTH). She had a past history of primary hypothyroidism, previous secondary amenorrhea, anxiety and depression. Her urine CCCR was low. However, dual energy X-ray absorptiometry (DEXA) scan showed evidence of osteopenia. In view of bone involvement, primary hyperparathyroidism was considered. She was treated with Cinacalcet 30 mg BD and underwent surgical removal of 3 parathyroid glands. Histology showed mild hyperplasia. Post-surgery, the calcium and PTH level became normal and a repeat DEXA scan showed normal bone density. Her low urine CCCR though was contrary to the diagnosis of primary hyperparathyroidism. Her father was later diagnosed with hypercalcemia and so she underwent genetic testing which showed FHH related CaSR gene mutation. She thus had both conditions coexisting.
Conclusion
Current guidelines recommend measuring urine CCCR to exclude FHH. However, the coexistence of FHH and primary hyperparathyroidism should be considered in patients with hypercalcemia, elevated parathyroid hormone levels, and low urinary calcium excretion with end-organ involvement. Surgical intervention isn't normally indicated in FHH. However, in this case it helped to reduce the degree of hypercalcemia, alleviate symptoms, and improve the bone density.

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M08

Original Research, Oral presentation

Safety and efficacy of PTH 1-34 and 1-84 therapy in chronic hypoparathyroidism: a meta-analysis of prospective trials

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Introduction
Hypoparathyroidism is the only endocrine deficiency for which replacement therapy with the missing hormone is not part of the clinical practice. High quality evidence on the use of PTH 1-34 or PTH 1-84 in hypoparathyroidism is missing.
Objective
We aim to evaluate the efficacy and safety of PTH 1-34 and PTH 1-84, and to compare the two treatments when possible.
Methods
We searched databases up to March 2021 for randomized control trials or prospective studies on PTH 1-34 and 1-84 in hypoparathyroidism. Three reviewers screened eligible publications (2070) and extracted the outcomes. Other performed quality control and all assessed the risk of biases.
Data synthesis
36 studies were selected for inclusion in meta-analysis, but 11 were excluded due to population overlap. Both PTH 1-34 and PTH 1-84 allowed a significant reduction in calcium and calcitriol supplementation, and many patients could discontinue conventional treatments. Metanalysis of biochemical profile showed stable calcium levels, while both treatments reduced serum phosphate levels, 25(OH) vitamin D and urinary calcium excretion. Calcium-phosphate product was decreased under PTH 1-84 only. Bone turnover markers and bone mineral density at lumbar spine increased after PTH treatment. Quality of life was also improved in patients receiving PTH. Safety evaluation did not show significant differences between patients and controls in the incidence of adverse events, but total number of adverse events was higher in PTH 1-84.
Conclusions
PTH therapy demonstrates promising efficacy in the management of hypoparathyroidism, reducing the need for other supplements and improving serum and urinary electrolytes profile, without safety concerns. However, further studies on additional outcomes, comparison between treatments and the inclusion of patients not controlled with conventional supplementation will help in expanding current knowledge on PTH replacement in hypoparathyroidism.

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M09

Original Research, ePoster

Vitamin D and geriatric syndromes in centenarians

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Aim of the study
To assess vitamin D levels in centenarians and its interaction with the most common geriatric syndromes
Materials and Methods
It was a longitudinal study, including 82 centenarians (95 years and older), who live in Moscow. Complex geriatric assessment and blood tests were performed. Complex geriatric assessment included past medical history, FRAIL, IADL-C, MNA, GDS-15 and MOCA scores. QoL questionnaires were used as well. In all patients we measured 25OH vitamin D levels. In one year after the investigations we contacted patients' relatives or social workers to find out about patients' status. The statistical analysis was performed using IBM SPSS Statistics Version 26. Statistically significant were differences with $P < 0{,}05$.
Results
Mean age of the patients was 98.3 ($\pm$1.9) years, while 87.8% of the cohort were women. Analyzing functional status we found out that 34.4% of the patients were frail, and the number of prefrail patients was 56.2%. Cognitive impairments of different severity were presented in 84.4% of the patients. Median vitamin D levels was 9.6 (6.9; 16.2) ng/ml. So in our group, 70 (86%) patients had vitamin D deficiency, 9 patients (12%) had vitamin D isufficiency and in only 3 patients (2%) we found vitamin D levels within the normal range. While comparing functional status and QoL with vitamin D profile we discovered positive correlation between vitamin D levels and Barthel index ($r = 0.348$), vitamin D levels and iADL ($r = 0.436$) and vitamin D and MNA ($r = 0.389$) (P less then 0.05).
Conclusion
Low vitamin D levels severely influence functional status, cognitive functions and QoL of older people, hence it is absolutely necessary to assess its levels in this population and restore them timely.

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M10

Original Research, Oral presentation

Vitamin D status and phosphorus-calcium metabolism in children with congenital epidermolysis bullosa

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Introduction
Congenital dystrophic epidermolysis bullosa (CDEB) is a rare genetic multisystem disease. Life expectancy of the patients has increased and the prevention of the delayed complications including osteoporosis has become relevant.
Aim of the study
To study vitamin D status and phosphorus-calcium metabolism in the children with CDEB.
Methods and materials
The study included 32 patients with CDEB, aged from 7 months to 18 years (the average age - 6 y11 m). Vitamin D, parathyroid hormone, total calcium, phosphorus, alkaline phosphatase, magnesium and creatinine levels were determined.
Results
Considering increased energy needs of the children with CDEB, all the children received special therapeutic mixtures enriched with calcium and vitamin D. Vitamin D level in the examined children averaged 21.2 ng/ml (13.1; 37.8). Its insufficiency (20-30 ng/ml) was detected in 21.9%, deficiency (10-20 ng/ml) - in 40.6%, deep deficiency ($<$10 ng/ml) - in 6.25% of the children. The low level of calcium in the blood of the examined children - on average 2.24 mmol/l (2.15; 2.4) - was caused by hypocalcemia in 43.8% of the children. 15.6% of them had borderline values. One child was diagnosed with secondary hyperparathyroidism due to calcium and vitamin D insufficiency.
Conclusion
The study showed that phosphorus-calcium metabolism disorders in children with CDEB are due to a low level of vitamin D supply combined with hypocalcemia. Thus, supplementation of the CDEB children with vitamin D taken together with diet correction and special therapeutic mixtures intake is the necessary strategy to maintain adequate phosphorus-calcium metabolism.

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M11

Original Research, ePoster
Elastography in hyperparathyroidism – decision algorithm
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Background
Primary hyperparathyroidism is a common disorder of the parathyroid glands and the third most frequent endocrinopathy, especially among elderly women. Secondary hyper-parathyroidism is a common complication of chronic kidney disease, associated with high cardiovascular morbidity and mortality. In both primary and secondary hyperparathyroidism, the need to correctly identify the parathyroid glands is mandatory for a better outcome. Elastography can be an effective tool in diagnosis parathyroid lesions, by differentiating possible parathyroid lesions from thyroid disease, cervical lymph nodes, and other anatomical structures. There are currently no guidelines recommendations and no established values on the elasticity of parathyroid lesions.
Methods
In our studies, we have evaluated by Shear Wave elastography, both primary and secondary hyperparathyroidism, determining that parathyroid glands have a higher elasticity index than both thyroid tissue and muscle tissue.
Results
For primary hyperparathyroidism we have determined using 2D-SWE, the parathyroid adenoma tissue (mean EI measured by SWE 4.74+/- 2.74 kPa) with the thyroid tissue (11.718+/- 4.206 kPa) and with the surrounding muscle tissue (16.362+/- 3.829 kPa). For secondary hyperparathyroidism, by SWE elastographic evaluation, we have found that the mean EI in the parathyroid gland was 7.83 kPa, a median value in thyroid parenchyma of 13.76 kPa, and mean muscle EI value at 15.78 kPa.
Conclusions
Elastography can be a useful tool in localizing parathyroid disease, whether is primary or secondary. We have determined that an EI below 7 kPa in SWE elastography, correctly identifies parathyroid tissue in primary hyperparathyroidism, respectively a cutoff value of 9.98 kPa can be used in 2D-SWE for accurately diagnostic of parathyroid disease in secondary hyperparathyroidism.

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M12

Case Report, ePoster
Management considerations for adults with x-linked hypophosphatemia: A case report
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Background
X-linked hypophosphatemia (XLH) is a rare, hereditary, progressive musculoskeletal disorder. Prompt diagnosis and treatment in childhood ensures adequate bone matrix mineralization and skeletal growth. There is no consensus on indications for treatment in adult patients.
Case Presentation
A 25 year old female was referred to endocrinology with a right ankle fragility fracture. She was known to have XLH, diagnosed in Poland at the age of 1 year. Her father and grandparents were also affected. She underwent multiple osteotomies and corrective surgeries for lower limb deformities and had recurrent dental abscesses. She was previously treated with Vitamin D supplements and phosphate salts; old case notes were not available. On examination, her height was 148cm (0.4th centile). Investigations showed mild hypophosphatemia with normal levels of corrected calcium, alkaline phosphatase, magnesium, 25-OH vitamin D and parathyroid hormone with no phosphaturia or hypercalciuria and no evidence of nephrocalcinosis on sonography. DEXA scan was normal. Genetic testing confirmed heterozygous PHEX mutation. She was started on Phosphate-Sandoz and Rocaltrol. She was non-compliant and stopped treatment herself, but remained asymptomatic with stable biochemistry. Five years later, she presented with severe bone pain affecting shoulders, spine and legs, and occasional difficulty in walking without support. Repeat biochemistry was stable. She was keen to commence Burosumab, a monoclonal FGF23 antibody, and was referred to a tertiary Metabolic Bone Unit.
Conclusion
Conventional treatment with active Vitamin D and oral phosphate salts for clinical improvement should be considered in symptomatic adults with XLH. In UK, Burosumab is approved for children and adolescents, but not adults due to lack of evidence on the long-term metabolic consequences. This case highlights management challenges for rare conditions and need for further studies to provide evidence based treatments.

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M13

Case Report, ePoster
Hypoparathyroidism after total thyroidectomy in a woman who underwent to bariatric surgery: A case report
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Background
Hypoparathyroidism (HypoPT) is characterized by low calcium and parathyroid hormone (PTH), often secondary to thyroid surgery. Treatment consists in activated vitamin D and calcium supplementation. Such treatment may be difficult in patients with malabsorption as calcium usually requires an acid environmental to dissolve, while calcitriol needs an intact intestine for a full absorption.
Case report
A 36-year old woman had a history of sleeve gastrectomy and Single Anastomosis Duodeno-Ileal switch (SADIS). She underwent total thyroidectomy for a papillary thyroid carcinoma. After surgery, she presented paresthesia. PTH was 3.4pg/ml and calcium 6.5 mg/dl. TSH was normal. The patient started calcium carbonate 3 gr and calcitriol 1.5 mg/day without resolution. Oral treatment was increased up to calcium carbonate 9 gr and calcitriol 4 mg/day, with poor control of the disease. The patient refused PTH analogues. For that, intravenous calcitriol 3 mg/week and calcium gluconate 3 gr/week infusion was started, with good control of symptoms. Oral treatment was continued calcium carbonate 3 gr and calcitriol 4 mg/day. After 6 months, calcitriol infusion was interrupted and at present, the patient is on high dose oral treatment. Calcium is 8.5 mg/dl.
Conclusion
In HypoPT the goals of supplementation are preventing symptoms of hypocalcemia, maintaining normal calcium levels, avoiding hypercalcemia and renal calcifications. Patients who have undergone gastric bypass or duodenal resection have an increased risk for hypocalcemia due to malabsorption. If available, calcium citrate or recombinant human PTH (rhPTH) can be considered. Alternatively, intravenous calcium and calcitriol infusion is useful to control the disease. When there is a good control, infusion can be interrupted to start an high dose oral therapy. Even when the patient is stabilized on an oral regimen, episodes of hypocalcemia may occur, so careful monitoring is required.

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Pituitary and neuroendocrinology

P01

Case Report, ePoster

Leptomeningeal metastasis in a patient with nasosinusal paraganglioma

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Paragangliomas (PG) originating from the nasal cavity are very rare and usually have an indolent growth. Surgery offers the only possibility of cure for these patients while radiotherapy can only slow their growth rate. Intracranial or leptomeningeal dissemination is very rare, with only 7 cases described in the literature. A 77 year old man with a 4-years history of nasal obstruction. He underwent a nasofibroscopy with a biopsy that revealed a nasosinusal neuroendocrine tumour. The patient underwent Weber-Fergusson surgery with frontal craniotomy. Histological examination confirmed the diagnosis of nasosinusal PG. Bone and lymphovascular invasion and intracranial growth were present. Two years later due to epistaxis, the imagiological study showed extension to the soft tissues of the left orbit and nasopharynx. In this context, the patient was proposed for stereotactic radiotherapy. Eighteen months later, the patient presented psychomotor slowing, unbalance and crural hemiparesis. MRI showed the appearance of multiple cystic dural nodules, leading to a mass effect and cerebral oedema. The patient was started on dexamethasone and oral chemotherapy with capecitabine and temozolomide. Despite the stability of dural lesions, the neurological status. This case represents one of the few malignant nasosinusal PG described in the literature. Although the most appropriate initial therapeutic approach was applied, the metastatic presentation in these cases offers a massive challenge, where therapeutic options are truly limited.

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P02

Case Report, ePoster

Amenorrhoea and hyperprolactinaemia – Physiology before pathology

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Background
Pituitary hyperplasia is a relatively common yet frequently overlooked condition which can occur in both physiological and pathological states. Pregnancy is one of the most common conditions associated with physiological pituitary enlargement.
Case Presentation
22-year-old normally fit and well lady presented to AMU (acute medicine unit) with a week history of headache and 10-month history of amenorrhoea following cessation of combined contraceptive pill. Pregnancy test done at home was negative and noted to have hyperprolactinemia of 1573 mU/l as investigated by her GP. Neurological examination was normal with normal visual acuity. Her repeat prolactin during the admission came back as 2097 mU/l and hence an MRI was carried out which reported a 9.5 mm pituitary enlargement proximal to but not compressing the optic chiasm. The rest of her pituitary hormone profile was normal. She was re-admitted to AMU a week later with increasing headache and blurred vision and diplopia but Goldman test confirmed no bitemporal field loss. CT head was done to rule out pituitary apoplexy which showed unchanged appearance from the previous scan. The repeat prolactin was 4953 mIU/l. After being seen by endocrinology team advising to repeat pregnancy test, she was found to be pregnant and confirmed by a dating scan. A diagnosis of pregnancy induced pituitary hyperplasia was made. MRI pituitary one year post-partum showed complete resolution along with normalisation of prolactin level.
Conlusions
It is very important to look for physiological causes like pregnancy while investigating for pituitary enlargement and high level of suspicion should be kept even with a negative home pregnancy test. An early and correct diagnosis could have prevented unnecessary exposure to radiation during pregnancy.

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P03

Case Report, ePoster

A rare case report of FSH secreting pituitary adenoma with apoplexy

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Background
FSH (Follicular stimulating hormone) secreting pituitary adenoma rare entity among functional pituitary tumors, with a few reported cases, almost certainly missed because of the lack of clinical examination skills. Approximately, 40-50% represent gonadotroph adenoma of all pituitary tumors. Only small percentage of these tumors secrete biologically active gonadotropins leading to gonadal stimulation.
Case presentation
Here, we report a unique case in a 26 old gentleman with a sellar tumor was referred to our hospital with suspected apoplexy. He had presented with complaints severe headache, nausea and vomiting of acute onset and gradual progressive vision loss in left eye since last 6 months. Visual assessment revealed absence of perception of light. Genital examination showed macroorchidism. Biochemical evaluation showed elevated FSH, with central hypothyroidism and hypocortisolemia. MRI brain with contrast showed, $5 \times 5.7 \times 8$cm T1W and T2W heterogeneously hyperintense sellar-suprasellar lesion with septated cystic areas with air fluid levels suggestive of cystic solid pituitary macroadenoma. Patient was subjected to transcranial followed by trans-nasal resection of tumor with replacement of thyroxine and steroid hormones, subsequently there was fall in FSH levels.
Conclusion
Functional gonadotropin adenomas cause distinct manifestations. This case alert clinicians to consider possibility of FSH secreting pituitary adenoma in patients with testicular enlargement and elevated FSH.

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P04

Original Research, ePoster

Fertility in acromegaly: A single center experience on female patients during active disease and after disease remission

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Fertility represents a major concern in patients with acromegaly and the peculiar PCOS-like condition is commonly found in acromegalic women. The current retrospective study aimed at investigating gonadal function and fertility rate in acromegalic women with disease onset (DO) within the reproductive age. In 50 women hormonal parameters and gynecological ultrasound were evaluated at diagnosis (DD) and after disease control (DC). Data about menstrual disturbances (MD), pregnancy desire, occurrence and outcome, and PCOS were investigated at DO, DD and DC. At presumed DO, MD were reported in 32% of patients. Uterine leiomyomata, ovarian cysts and PCOS were diagnosed in 18%, 12% and 8% of patients. Among women with pregnancy desire (37.2%), 36.9% resulted infertile. At DD, MD were found in 58.1% ($P=0.02$ vs DO) and were significantly more prevalent in patients with higher IGF-I quartiles (Q) ($P=0.03$, Q1 vs Q4). Gynecological ultrasound revealed uterine leiomyomata, ovarian cysts and PCOS in 39.1% ($P=0.04$), 28.3% ($P=0.09$), and 13.6% ($P=0.55$), respectively. Among those with pregnancy desire (13.9%), infertility rate was 100% ($P=0.02$ vs DO). At DC, 36.4% of patients still in the reproductive age have MD. MD ($P=0.05$) and amenorrhea ($P=0.03$) significantly persisted in patients with disease duration above than in those with disease duration below 5 yrs (median). Prevalence of ovarian cysts (10%, $P=0.08$) slightly reduced compared to DD. Among patients with pregnancy desire, 73.3% spontaneously conceived at least once, resulting in a significant decrease of infertility rate (26.7%, $P=0.01$) compared to DD. At-term, pre-term deliveries and spontaneous abortions were recorded in 86.7%, 3.3% and 10%, respectively, in 30 pregnancies. During gestation, 2 patients received somatostatin analogues, and one had gestational diabetes. Gonadal dysfunction and infertility are common in women with acromegaly within the reproductive age and are directly influenced by the disease status and/or duration.

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P05

Case Report, ePoster

A rare case of gonadotroph adenoma in a young woman

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Background
Functioning gonadotroph adenomas (GA) account for 20 to 25% of all pituitary adenomas. Clinical presentation consists in multiple ovarian follicles and cysts, higher estradiol level and endometrial hyperplasia. The treatment of choice is transphenoidal tumor resection.
Case Presentation
A 40 year old woman presented with abdominal pain and menstrual cycle dysfunctions. Hormonal evaluation showed: FSH:13.8 mU/ml, estradiol:1549 pg/ml, PRL:81.7 ng/ml, 17OH-progesterone:5 ng/ml, testosterone levels: 0.30 ng/ml. In the hypothesis of GA, second level testing were performed. FSH, LH and PRL did not show any response to GnRH and TRH stimulation. Pelvic imaging showed: multiple miomas, increased uterine and ovarian volume with multiple cysts. Pelvic MRI was suggestive for ovarian hyperstimulation syndrome (OHSS) (right ovarian: 10.8 cm×5.6 cm; left ovarian: 3.7 cm×11.5 cm). Breast imaging showed high density of tissue, in absence of suspicious nodule. Brain MRI revealed a 17×20×17 mm pituitary lesion described as a macroadenoma. A 18-FDG-PET-TC showed an increased uptake of the lesion. Markers for gynecological tumors were negative. The patient underwent neurosurgery and histological documented a pituitary macroadenoma. Immunoistochemical was positive for LH, FSH, p53, CK-CAM5.2, chromogranin and negative for ACTH-GH-PRL-TSH. Ki67 was 2-3%. After surgery, the patients recovered. Periods were regular, breast tenderness disappeared and after 6 months, ovarian imaging was normal.
Conclusions
The finding of multiple ovarian cysts usually is present in polycystic ovary syndrome. A complete hormonal asset is always necessary, as a differential diagnosis can be GA. Generally, women with gonadotroph adenoma have severe hyperestrogenism, with inappropriate FSH values. GA can also have the same constellation of symptoms associated with OHHS. For that a correct hormonal, imaging and histological evaluation is necessary to confirm the diagnosis of GA.

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P06

Original Research, ePoster

Discrepancy between short synacthen test (sst) and insulin stimulation test (ist)

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Background
Hypothalamus pituitary adrenal axis (HPA) dysfunction is associated with serious morbidity and mortality. Its symptoms can be non-specific. Objective diagnosis depends on clinical suspicion and confirmed on assessment of early morning cortisol or dynamic assessment of cortisol secretion. The cosyntropin or short synacthen test (SST) has emerged as the most common test to assess the HPA. The insulin stimulation test (IST) is the traditional 'gold standard' test for this, but is less favored because it is less convenient to perform, and contraindicated in patients with cerebral and cardiac pathologies.
Cases
We report 4 patients who had normal SST results at first, but continued to remain symptomatic. They then had ISTs which demonstrated cortisol deficiency. They were then commenced on replacement hydrocortisone after which their symptoms markedly improved.
Conclusion
The short synacthen test is more practical compared to the insulin stimulation test, and it remains the favored test to assess the HPA axis periodically. However, clinicians should have a high index of suspicion when symptoms suggesting adrenal insufficiency persist despite a normal SST.

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P07

Case Report, ePoster

Pregnancy and diabetes insipidus – A management conundrum

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Background
Diabetes Insipidus (DI) is uncommon during pregnancy. It may predate pregnancy, be unmasked by pregnancy or arise de novo during pregnancy secondary to other pathology. We present a case of DI in pregnancy to highlight challenges in management.
Case Report
A 27-year-old lady at 21 weeks' gestation, presented to A&E with worsening headache and confusion for three to five months. She was hemodynamically stable, had bitemporal hemianopia with no neurological deficit. Investigations showed anterior hypopituitarism, short Synacthen test confirmed secondary hypoadrenalism and MRI Pituitary showed macroadenoma with acute obstructive hydrocephalus. She was started on Hydrocortisone and Levothyroxine replacement and, underwent right frontal external ventricular drain (EVD) insertion. Three days later she had selective trans-sphenoidal pituitary adenomectomy. Post-operatively on Day 0 she had hypernatremia, serum sodium 152 mmol/l and polyuria. She was started on Desmopressin (DDAVP). Repeat biochemistry showed sodium 144 mmol/l, plasma osmolality 294 mmol/kg, urine osmolality 46 mmol/kg and Urine sodium <20 mEq/l, confirming DI. She needed close monitoring by endocrinology for dose titration of DDAVP. Post-operative MRI Pituitary showed improvement in obstructive hydrocephalus. She was discharged on Levothyroxine, Hydrocortisone and DDAVP replacement. At 34 weeks' gestation she presented to A&E with pre-eclampsia and hyponatremia (sodium 125 m mmol/l). She underwent emergency LSCS and delivered a baby girl. Post-LSCS she had persistent hyponatremia (sodium 123 mmol/l, POsm 264 mmol/kg and UOsm 449 mmol/kg) and required lower doses of DDAVP.

Conclusion
Management of Cranial DI in Pregnancy is a challenge as placental cysteine aminopeptidase increases throughout pregnancy in parallel to increased clearance of arginine vasopressin (AVP). Fluid balance, serum sodium, plasma and urine osmolalities should be monitored closely during pregnancy, peripartum and postpartum periods to optimise DDAVP doses to achieve homeostasis. 1777 characters, 272 words.

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P08

Original Research, Oral presentation
Indexes of chronic low-grade inflammation in different models of insulin-resistance: Evaluation of lipocalin-2 in metabolic sindrome, partial and total growth hormone deficiency

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Lipocalin-2 (LCN2) is a glycoprotein synthetized by various cell types, including neutrophils, that acts as siderophores scavenger and play an important role in different chronic inflammatory processes. Metabolic Syndrome (MetS) and Adult Growth Hormone Deficiency (AGHD), both partial and total, are characterized by inflammatory features. The objectives of our cross-sectional study were: 1) to compare LCN2 levels in these clinical pictures; 2) to evaluate the relations between LCN2 levels, BMI and indexes of insulin-resistance. 74 patients were divided in 4 groups as follow: group A, MetS ($n=18$, 13 males, mean?SEM age 48.63 ± 2.19 ys, BMI 31.22 ± 1.73 kg/m^2); group B, total AGHD ($n=18$, 10 males, aged 52.44 ± 2.61 ys, BMI 30.49 ± 1.87 kg/m^2); Group C, partial AGHD ($n=19$, 6 males, aged 48.63 ± 2.19 ys, BMI 29.11 ± 1.85 kg/m^2); Group D, controls ($n=19$, 6 males, aged 40.26 ± 2.87 ys, BMI 23.25 ± 0.95 kg/m^2). AGHD patients were classified according to serum GH peak after iv GHRH + arginine test: total (<9 mg/l if BMI <30 kg/m^2 or <4 mg/l if BMI 30 kg/m^2), partial (9-16 mg/l if BMI <30 kg/m^2 or 4-9 mg/l if BMI >30 kg/m^2). In all patients metabolic parameters were measured (glucose, insulin, HOMA-IR, QUICKI, total- LDL- and HDL-cholesterol, triglycerides, uric acid, IGF-1 and LCN2). LCN2 levels were significantly increased in MetS (mean?SEM A 70.4?5.5; B 54.9?4.0; C 51.5?3.7; D 46.2?4.1 ng/ml), while no significant differences with controls were found in total and partial AGHD. LCN2 levels did not correlate with BMI. A significant positive correlation between LCN2 and HOMA-index was found in controls ($r^2=0.6$, $P<0.05$), while a positive trend-like, yet not significant, was observed in partial AGHD. Our data showed an increase in LCN2 plasmatic levels in MetS. Different inflammatory patterns characterize MetS and GHD. The correlation between HOMA index and LCN2 in normal subjects and, possibly, in partial AGHD patients may suggest a modulatory action of LCN2 on insulin resistance.

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P09

Case Report, ePoster
Case Report: Pituitary metastasis and its diagnostic complexity

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Background
Pituitary metastasis (PM) is a rare occurrence in malignancy, associated with poor prognosis. Only 7% of patients are symptomatic. High index of suspicion and prompt investigation are essential. We report a case of PM, highlighting challenges in diagnosis and management.
Case Report
Sixty-six year old male was referred to endocrinology due to headaches and hyponatremia. He had metastatic colorectal carcinoma, treated with bowel, liver and lung resections and chemotherapy. Clinical examination was unremarkable and he was euvolemic. Baseline investigations suggested SIADH (serum sodium (Na) 121 mmol/l, plasma osmolality 253 mmol/kg, urine osmolality 318 mmol/kg and urine sodium 45 mmol/l). CT Head was normal. Further investigation supported provisional diagnosis of adrenal insufficiency (9am cortisol 97nmol/l) and hydrocortisone was added to management with fluid restriction. Bloods later returned with borderline satisfactory cortisol response (471 nmol/l, new assay) on short synacthen test (SST) and normal ACTH (11.1 ng/l). MRI head and CT thorax, abdomen and pelvis (including adrenals) were unremarkable. Hydrocortisone was stopped and patient discharged. Two days later, he presented with symptomatic hyponatremia (Na 122 mmol/l). Hydrocortisone was restarted and Na levels normalised. Anterior pituitary hormone profile revealed panhypopituitarism and MRI Pituitary showed PM (6-7 mm lesion in proximal pituitary stalk). Dexamethasone and levothyroxine was started. MDT review deemed him for palliation only. One month later he passed away.
Conclusion
PM should be considered as a differential for hyponatremia due to adrenal insufficiency in patients with metastatic cancer. Our case highlights the complexities of diagnosing secondary adrenal insufficiency of recent onset as SST may show misleading borderline normal response. High clinical suspicion and early scrutiny with full pituitary hormone profile and imaging can aid in timely diagnosis of PM.

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P10

Original Research, Oral presentation
Hormonal adjustment to metabolic derangement in adult Growth Hormone Deficiency: evaluation of Ghrelin and LEAP-2 serum level

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Background
Ghrelin and its endogenous antagonist liver-expressed antimicrobial peptide-2 (LEAP-2) are involved in GH secretion, both acting on GSH-r1α, and regulation of glucose and lipids metabolism. Metabolic impairments are often accompanied by an upregulation of LEAP-2 expression, with a usual concomitant reduction in ghrelin secretion. Adult growth hormone deficiency (aGHD), characterized by weight gain, increased fat mass and insulin resistance, represent a condition of metabolic derangement.
Objectives
The primary objective of this cross-sectional observational pilot study was to compare circulating LEAP-2 and ghrelin serum levels in aGHD and healthy controls.
Methods
30 patients were included in the study. Group A included adult GHD: 15 patients, 8 females and 7 males. Median and interquartile range age of the group was 53 (41–57) years, while BMI was 27.1 (25–35) kg/m^2. Group B was formed by 15 healthy controls (10 females and 5 males). Median and interquartile range age was 47 (36–57) years, while BMI 22.9 (20.8-33.1) kg/m^2. They were evaluated for serum glucose and insulin, HOMA-index, QUICKI-index, total/lDL/HDL cholesterol, triglycerides, IGF-1, ghrelin and LEAP-2.
Results
Ghrelin levels in the aGHD group were significantly lower than in healthy controls. In contrast, LEAP-2 showed a trend toward higher levels, although the differences were not significant. However, LEAP-2/Ghrelin molar ratio, an index of receptor affinity, was significantly higher in aGHD. No significant correlations between ghrelin and LEAP-2 with BMI, HOMA index and other parameters were found in aGHD population. However, a significant inverse correlation ($r^2=0.15$, $P=0.047$) between BMI and ghrelin was evidenced when considering the whole population.
Conclusions
These results may suggest a body adaptation to a metabolic scenario typical of aGHD. The decrease in ghrelin production could prevent further weight gain and fat mass increase, although losing its secretagogue effect.

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P11

Original Research, Oral presentation
Pituitary adenoma consistency is associated with postoperative hormonal deficits: a retrospective study on 50 patients undergoing transsphenoidal adenomectomy

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Background
Little is known about possible predictors for hormonal function following pituitary surgery. Tumor consistency has recently emerged as a key factor in surgical planning for pituitary adenomas, influencing both the surgical outcome and the onset of postoperative complications. However, its impact on post-operative endocrine function has yet to be explored.
Objectives
To evaluate the impact of tumor consistency on the development of postoperative pituitary deficits.
Methods
We performed a single-center, retrospective analysis of 50 consecutive pituitary surgeries performed between June 2012 and January 2021 at Policlinico Umberto I in Rome. All patients underwent radiological and biochemical evaluations at baseline, as well as hormonal assessments 3 and 6 months after pituitary surgery. A single surgeon performed all surgical procedures and provided data regarding tumor consistency and macroscopic appearance, as well as neurosurgical approach.
Results
50 patients [24 females, mean age 57 ± 13 years, median tumor volume 4800 mm^3], were included. Greater tumor volume and male sex were both associated with worse preoperative endocrine function ($P < 0.0001$). All patients underwent transsphenoidal adenomectomy without intraoperative complications. Fibrous adenoma consistency was observed in 10% of patients and was associated with a greater risk of developing postoperative hormone deficiencies at 3 months ($X^2 = 4.485$, $P = 0.05$, OR = 8.571; 95% CI: 0.876-83.908) but showed only borderline association with endocrine deficits at the 6-months follow-up ($X^2 = 3.986$, $P = 0.07$, OR 7.733, 95% CI: 0.792-75.474).
Conclusions
Predictors of endocrine outcomes following pituitary surgery are still an unmet need. In this small cohort, we demonstrated that tumor consistency might provide useful information about postoperative pituitary function, likely due to its impact on surgical procedures. Further prospective studies with larger cohorts are needed to confirm our preliminary findings.

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P12

Case Report, ePoster

Apoplexy in a patient with a Plurihormone Pituitary adenoma with corticotroph predominance

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Introduction
Silent corticotroph adenomas(SCA) are defined as pituitary adenomas showing positive staining for adrenocorticotrophic hormone in immunohistochemical studies not associated with clinical/laboratory features of hypercortisolaemia. We report a case of SCA in a 61-year-old man, who presented with pituitary apoplexy.
Case presentation
Patient presented with persistent diplopia of 3 months duration, associated with severe headache for 1 week. He had a history of hypertension but no other conditions. On examination a third nerve palsy and ophthalmoplegia in the right eye were observed. He was normotensive and did not have any clinical features of Cushing's syndrome. MRI Pituitary showed large intrasellar and suprasellar haematoma related to underlying pituitary adenoma extending into the right cavernous sinus, compressing the optic chiasm with features of apoplexy. Biochemistry revealed 9 am cortisol of 247 mmol/l, FT4 10.4 pmol/l, Na 140 mmol/l, K 4.0 mmol/l and HbA1c 5.3%. He was immediately started on hydrocortisone replacement therapy and underwent transsphenoidal hypophysectomy. Post-operatively, right 3rd nerve palsy resolved and ocular movement improved. Biochemistry showed the following levels:Cortisol 354 nmol/l, FT4 14 pmol/l, TSH 1.14 mIU/l, Testosterone 12.3nmol/l, FSH2.7IU/l, LH4.4IU/l, Prolactin 108, ACTH 5.0 ng/l. Overnight dexamethasone suppression test showed adequate suppression, with cortisol levels of 26 nmol/l.24 hr urine cortisol levels were normal. Histology showed expression of corticotroph cells(Ki-67, 3-5%). Findings were consistent with Grade 2b as per PitNET 2017 classification. Postoperative MRI showed decompression of the chiasm and tiny residual tumour in the right cavernous sinus.
Conclusion
This is an interesting case with a likely pre-existing pituitary macroadenoma, presenting with features of apoplexy, but no obvious triggering factor. Histology revealed a SCA. As per 2017 guidelines he should be monitored closely for potential aggressive behaviour.

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P13

Case Report, ePoster

Consecutive adrenal cushinǵs syndrome and cushinǵs disease in a patient with somatic *CTNNB1, USP8, and NR3c1* mutations

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Context
The occurrence of different subtypes of endogenous Cushing's syndrome (CS) in single individuals is extremely rare. We here present the case of a female patient who was successfully cured from adrenal CS 4 years before being diagnosed with Cushing's disease (CD).
Case Description
A 50-year-old female was diagnosed with ACTH-independent CS and a left-sided adrenal adenoma in January 2015. After adrenalectomy and histopathological confirmation of a cortisol-producing adrenocortical adenoma, biochemical hypercortisolism and clinical symptoms significantly improved. However, starting from 2018, the patient again developed signs and symptoms of recurrent CS. Subsequent biochemical and radiological workup suggested the presence of ACTH-dependent CS along with a pituitary micoradenoma. The patient underwent successful transsphenoidal adenomectomy, and both postoperative adrenal insufficiency and histopathological workup confirmed the diagnosis of CD. Exome sequencing excluded a causative germline mutation, but showed somatic mutations of the β-catenin protein gene (CTNNB1) in the adrenal adenoma, and of both the ubiquitin specific peptidase 8 (USP8) and the glucocorticoid receptor (NR3C1) genes in the pituitary adenoma.
Conclusion
Our case illustrates that both ACTH-independent and ACTH-dependent CS may develop in a single individual even without evidence for a common genetic background.

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P14

Original Research, Oral presentation

Digital transformation of a hyponatraemia toolkit: Impact on clinical practice

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Background
Hyponatraemia occurs in 10- 15% of hospital admissions and is associated with

an increased rate of mortality, length of stay in hospital and readmission rates when compared to patients with normal sodium levels. We developed a hyponatraemia algorithm pdf document to all non endocrine general physicians (GPs) in our hospital to aid in managing hyponatraemia effectively. However when we re-audited our practice, these guidelines were rarely used and there was a large variation in care particularly in diagnosing Syndrome of inappropriate AntiDiuresis (SIAD).
Objective
To assess the impact of a novel digital application of a hyponatraemia diagnostic toolkit (https://hyponatraemia.wordpress.com/) that can be accessed via mobile phones for GPs if it will: A) increase the use of the diagnostic algorithm when Sodium is < 130 mmol/l B) have an impact on physicians confidence in managing hyponatraemia C) encourage the use of the Bartter-Schwartz (BS) criteria to diagnose SIAD.
Method
A questionnaire survey was sent to GPs before and after the digital application launch of the tool to investigate our objectives. We tracked the internet traffic of the digital tool after its launch.
Results
Twenty three GPs responded to the survey. 68% of responders would start investigating at a level less than 130 mmol/l but this increased to 100% with the digital tool. Mean daily web access of the new tool was 14.3 (0.2 prior to new tool). Mean confidence in managing hyponatraemia increased from 2.4 to 3.7 (scale from 1 to 5, $P < 0.01$ t-test).100% of GPs complied with the BS criteria compared with only 5% prior to the launch.
Conclusion
This novel digital hyponatraemia toolkit was successful in increasing the confidence and awareness for GPs in the management of this common condition. It also helped reduce the large variation in care. The impact of reduction in referrals to the endocrine specialist team are currently being analysed.

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P15

Original Research, Oral presentation
Altered splicing machinery as a source of biomarkers in lung neuroendocrine neoplasms

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Introduction
Emerging evidence indicates that dysregulation of alternative splicing represents a new hallmark of cancer. This dysregulation may arise from mutations or altered expression of specific components of the splicing machinery. To date, splicing machinery status has not been studied in lung neuroendocrine neoplasms: typical and atypical pulmonary carcinoids.
Objectives
Here, we aimed to analyzing the splicing machinery in pulmonary carcinoids and exploring its relationship with alternative splicing pattern.
Methods
A custom-made qPCR array was used to measure the expression of the main components of the splicing machinery in a cohort of 33 pulmonary carcinoids patients (tumor vs. adjacent tissue). Results were validated using a publicly available external cohort of 51 patients. Statistical analyses were made to study its association with clinical parameters of the patients. In addition, alternative splicing analyses were performed in RNAseq data of a cohort of 20 patients using SUPPA2 tool.
Results
One third of the components of the splicing machinery were dysregulated in pulmonary carcinoids. Remarkably, a discrete subset of specific components of the spliceosome, as well as key splicing factors displayed significant associations to key clinical parameters, including tumor stage and tumor dissemination. These results were validated in the external cohort of patients, and key components were selected based on their relevance and the association to clinical parameters. Alternative splicing analyses in RNAseq data showed that the expression of these key components was correlated to altered patterns of alternative splicing.
Conclusions
Our results indicate that the splicing machinery is severely dysregulated in pulmonary carcinoids, where some of its components are associated to key clinical parameters of tumor malignancy. These results unveil new avenues to study pulmonary carcinoids and discover new diagnostic/prognostic and therapeutic tools.

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P16

Case Report, ePoster
Rarest of them all: A case of chronic lymphocytic leukaemia mimicking pituitary adenoma

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65-year-old lady presents to GP with 3-month history of fatigue, weight loss and nausea with background of stable Chronic Lymphocytic Leukaemia (CLL). GP started Levothyroxine 25 mg OD due to low T4 of 5.9 pmol/l (12-22) and low TSH of 0.25 mU/l (0.27-4.2). As she continued to feel tired, random cortisol was requested which was low at 25nmol/l leading to admission. Admission cortisol was 55nmol/l with an inappropriately normal ACTH of 11.6 ng/l (7.2-63.3). Pituitary profile showed evidence of panhypopituitarism with low LH 0.1IU/l (postmenopausal 15.9 - 54.0 IU/l), low FSH 5.1IU/l (postmenopausal 23.0 - 116.3 IU/l) and modest elevation of prolactin, possibly due to stalk effect, at 944 mU/l (102-496). She was started on IV Hydrocortisone (HC) and levothyroxine was increased to 50 mg OD. Pituitary MRI showed 12.3×12.3×12 mm lesion abutting the optic chiasm. Visual field assessment was normal. After review at pituitary MDT clinic, the outcome was to repeat MRI in 6 months to monitor progression. Repeat MRI revealed slight progression of the lesion and she opted to undergo transsphenoidal surgery. Histology and immunochemistry showed features consistent with CLL and no evidence of superadded pituitary adenoma. MRI at 3-, 6- and 24-months post-op showed no recurrence of CLL in the pituitary. She is under regular haematology follow-up and her CLL is stable. Hereby we report an exceedingly rare case of a patient with symptoms of panhypopituitarism with MRI findings of a pituitary lesion which later transpired to be CLL mimicking a pituitary macroadenoma. Central nervous system infiltration by CLL is unusual and involvement of the pituitary, to our best knowledge, has been reported in only a handful of cases. Our case adds to the limited literature of this extremely unusual occurrence. We conclude in any patient with CLL presenting with symptoms of hypopituitarism, one should consider CLL infiltration of the pituitary as a rare but possible differential diagnosis.

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P17

Case Report, ePoster
Incidental macroprolactinoma: A case report

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Background
Incidental macroprolactinoma is an unsuspected prolactin-secreting pituitary adenoma larger than 1 cm that is discovered by an imaging test performed for an unrelated reason.
Case presentation
A 25-year-old man was diagnosed with incidental macroprolactinoma (30.3×23.4×22.6 mm) following a head MRI scan after trauma. At the initial investigation, the patient had no complaints and denied any sexual dysfunction. Physical examination showed obesity without hypertension, reduced face and normal body hairiness, abdominal stretch marks and vitiligo of genitalia. No other pathology of the genitalia nor gynecomastia were found. Hormone testing

revealed high prolactin (PRL) (36768,6 mU/l), DHEA-SO4 (23 umol/l) and aldosterone (1088 pmol/l) levels while FSH (0.83 U/l), LH (0.82 U/l), testosterone (T) (3.56 nmol/l) and IGF-I (7.92 nmol/l) were low. Despite low T, the spermogram was normal. Neuro-ophthalmic examination showed no pathology. The patient refused surgery and was successfully treated with low doses of Bromocriptine. After 5 months of treatment, macroadenoma shrank by 45% and serum PRL decreased to normal. However, LH, FSH and T levels remained low. Abdominal MRI scan excluded adrenal mass suggesting functional hyperdehydroepiandrosteronism. Following the limitations of movement and healthcare access during the SARS CoV 2 pandemic, the patient stopped his visits to the endocrinologist. Moreover, thinking of the lack of symptoms as the "disappearance of the disease", he also stopped Bromocriptine intake. 4 months after drug withdrawal, a head MRI scan revealed the increase of the tumour by 50% comparing to the latest scan. After the renewal of medication intake PRL quickly decreased to normal.

Conclusions

Most prolactinomas are easily treated by medications or surgery. However, the absence of symptoms does not necessarily indicate a benign course of the disease and continued monitoring of lesion size, as well as hormonal status, is necessary.

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P18

Original Research, Oral presentation

A novel molecular subclassification may predict somatostatin analogs response in corticotropinomas

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Background

Cushing's disease is the result of prolonged and excessive exposure to cortisol caused by a pituitary tumor. Treatment with somatostatin analogs (SSA), which can reduce hormone secretion and tumor growth in other pituitary tumors (e.g., somatotropinomas), is usually ineffective in corticotropinomas. Previous studies indicated that presence of the truncated SST5TMD4 receptor variant is associated with a lack of response to SSA in acromegaly; but, its presence and functional role in corticotropinomas is still unknown.

Objectives

The aim of this study is to gain further insight on the molecular and functional role of somatostatin receptors (SSTs) in corticotropinoma cells.

Methods

Thus, expression levels of SSTs were measured in 30 corticotropinomas and 8 normal pituitary samples. Functional assays were performed in corticotropinoma primary cell cultures.

Results

In general, we observed a differential expression of SSTs in corticotropinomas compared to normal pituitary samples. A deeper analysis revealed the existence of two corticotropinomas subpopulations that differed in the expression of the receptors. The named 'high' population expresses all SSTs, presenting a higher expression SST5TMD4, while the 'low' subpopulation, displayed lower SST1/SST2/SST3 levels. Functional studies in primary cultures revealed that both subpopulations differentially respond to *in vitro* treatment with SSA, octreotide and pasireotide. Finally, SST5TMD4 overexpression increased cell viability.

Conclusions

Our data indicate that there could be two subpopulations of corticotropic tumors, which could confer differential responsiveness to SSA. Furthermore, the presence of SST5TMD4 may be associated with a higher rate of cell proliferation in corticotropinomas. Consequently, a detailed expression profile of all the SSTs in corticotropinomas, especially SST5 variants, could assist the prediction of response to SSA in patients with Cushing's disease.

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Reproductive Endocrinology

R01

Case Report, ePoster

Androstenedione - the missing link: A case of 17β-hydroxysteroid dehydrogenase 3 deficiency

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Introduction

46 XY Disorders of Sex Development (46, XY DSD) is defined by the presence of female or incompletely virilized external genitalia in a 46, XY individual. 17β-hydroxysteroid dehydrogenase 3 (17βHSD3) deficiency is one of the causes for testosterone biosynthetic defects. It leads to defective conversion of androstenedione to testosterone. 17βHSD3 deficiency can present with female phenotype with inguinal hernias at birth, clitoromegaly during infancy or virilization of a female child during puberty. It can also present as gynaecomastia in males. We report a case of 17βHSD3 deficiency which presented with gynaecomastia.

Case report

10-year-old child presented with enlargement of both breasts for 7 months, not associated with pain, galactorrhoea. At birth child was identified as female, however at 5 months of age, karyotype was done in view of enlarged phallic structure. It revealed 46, XY and child's gender was re-assigned as male. At 5 months, Testosterone was 1.5ng/ml, & Dihydrotestosterone (DHT) 77pg/ml. Post stimulation with HCG, Testosterone was 2.6ng/ml, DHT 128pg/ml. This suggested testosterone biosynthetic defect & androstenedione was not measured. Child underwent orchidopexy and staged penile reconstruction. Left testis was atrophic and left *in situ*. Currently on examination, child's growth was normal with height and weight being above 90th percentile. Androstenedione level was 2.76ng/ml. Testosterone to androstenedione ratio was 0.55(low) which was suggestive of 17βHSD3 deficiency. Genetic analysis confirmed the diagnosis.

Conclusion

17βHSD3 deficiency is one of the differential diagnosis of ambiguous genitalia in a 46 XY individual. It may be confused with 5α-reductase deficiency and complete androgen insensitivity syndrome. The case highlights the importance of androstenedione and need to suspect when gynaecomastia is present at pubertal age. Timely evaluation and diagnosis helps in preventing complications like testicular malignancy.

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R02

Original Research, ePoster

How much do newly graduated healthcare professionals know about PCOS?

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Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine conditions affecting women of reproductive age. Recent studies have shown several long term comorbidities associated with PCOS, thus making it essential that all physicians, regardless of training and specialty, understand and empower women with PCOS to adopt evidence-based behavioral changes. This study set out to establish an understanding of evidence-based lifestyle management of PCOS and the current practices of implementing it in clinical practice amongst final year medical students and newly graduated healthcare professionals. A total 67 participants took part in the survey (41 female and 25 male; medical students (21%), foundation doctors (64%) and senior house officers (15%); 34% from London deanery and 27% from the West Midlands deanery). 54% ($n=36$) knew the correct prevalence of PCOS. Although 70% ($n=47$) knew biochemical androgen excess is a sign of PCOS, only 43% ($n=28$) and 1% ($n=1$) knew free testosterone and free androgen index respectively, were the tests of choice to diagnose this. Instead, androstenedione (52% ($n=35$) and DHEAS (43% ($n=29$) were the most common biochemical tests of choice by this cohort. Interestingly, 55% (n37) said they would use AMH as a test to diagnose PCOS. Although most of the participants knew that BMI 94% ($n=63$) and waist circumference 95% ($n=64$) required routine monitoring between 6-12 months for PCOS, only 6%

($n=4$) were aware of the national recommendations for exercise. 36% ($n=26$) identified obesity and T2DM as the most common long term effects of PCOS. Our study highlights that physicians and medical students have a limited understanding of the international evidence-based recommendations for PCOS. More work needs to be done to incorporate the PCOS education at the level of medical schools with the aim of improving clinical outcomes.

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R03

Original Research, ePoster

PCOS SEVa: High prevalence of anxiety, depression and body dysmorphia in people with PCOS suggesting we need to rethink how we screen and manage emotional wellbeing in people with PCOS

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Aim

We evaluated the emotional wellbeing and lifestyle advice received by people with PCOS in comparison to National Institute of Health and Care Excellence (NICE) and international guidelines. Methods: Patients attending fertility clinics at Queen Elizabeth Hospital Birmingham between October 2020-May 2021 and in India between March 2021-May 2021 were invited to complete surveys before and after attending clinic. Pre-clinic survey had questions on demographics, Hospital Anxiety and Depression Scale (HADS; score 8-10 borderline; score $\geq$11 cases of anxiety and depression, respectively), Body Image Concern Inventory (BICI; score $\geq$72 suggestive of body dysmorphic disorder, BDD), Beliefs About Obese Persons Scale (BAOP; higher score suggestive of weight bias), and Female Sexual Function Index (FSFI; higher score suggestive of psychosexual dysfunction). Post-clinic survey included questions to understand patient experience and lifestyle recommendations participants received in clinic. Results: 56 patients completed pre-clinic survey (33.9%:White British). The prevalence of anxiety and depression was 50% and 10.7%, respectively (HADS anxiety median 10.5(interquartile range 7-12.75); depression 5.5(3-8.75)). 30.4% suffered from BDD. Participants had higher scores for BAOP 30(24.5-36) and FSFI 2(5-26). 38 completed post-clinic survey (26.3%:White British). All attendees reported positive experience with 76.3% reporting 'very good'. 97.4% felt they were well included in their management. 71.1% reported receiving lifestyle advice during clinic; 52.6% and 50% were advised about healthy eating and regular physical activity. 26.3%, 31.6% and 36.8% were screened for anxiety, depression and body image concerns respectively. 23.7% of patients attending the PCOS clinics did not feel that ethnicity played a role in predisposing cardiometabolic complications. Conclusion: A high prevalence of emotional illbeing suggests a need to improve our screening and management of this in PCOS.

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R04

Original Research, ePoster

Serum prolactin levels interact with menstrual fluctuations of arterial stiffness

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Objective

Prolactin has been adversely associated with arterial function in postmenopausal women but its vascular effects in reproductive women are unknown. Furthermore, although both circulating prolactin levels and markers of vascular function follow menstrual cycle (MC) phases, their possible inter-correlation has not been explored.

Methods

Sixty healthy premenopausal women were evaluated in two distinct phases of their MC (follicular, F and luteal phase, L). On both occasions, we obtained blood samples to assess prolactin and sex hormone levels and measured carotid-femoral pulse wave velocity (PWV) as an index of arterial stiffness and flow mediated dilation (FMD) as an index of endothelial function.

Results

Prolactin significantly increased from follicular to luteal phase [11.9 ng/ml (7.8-15.6) vs 14.6 (9.3-22) ng/ml, $P=0.002$]. Increased F-prolactin was associated with lower L-FMD ($P=0.016$) and higher L-PWV ($P=0.029$) independently of traditional cardiovascular risk factors or sex hormone levels. Women with high F-prolactin more frequently presented L-PWV above reference for age and blood pressure (19% vs. 2.5%) and L-FMD below reference for our lab (30% vs 7.7%) than those with lower F-prolactin. Finally, MC changes in prolactin were associated with concomitant changes in PWV (p for interaction between the group of women with sustained high or increased prolactin vs the rest of the cohort = 0.005).

Conclusion

High-normal circulating prolactin is associated with vascular dysfunction and persistently increased arterial stiffness during MC. Further research should elucidate the clinical relevance of such sustained vascular dysfunction related to increased prolactin in women during their reproductive age.

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R05

Original Research, Oral presentation

Levels of circulating amyloid beta 1-40 are associated with the rate of progression of atherosclerosis in menopause

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Background

Recent data is indicating that levels of circulating amyloid β 1-40 (αβ1-40), a proatherogenic aging peptide, may be considered as a novel biomarker in cardiovascular disease (CVD). Postmenopausal women represent a population with substantial unrecognized CVD-risk, which would benefit from identification of novel cardiovascular risk markers.

Aim

To explore the role of plasma Aβ1-40 and its patterns of change over time in atherosclerosis progression in postmenopausal women.

Methods

This is a prospective study, which recruited a tota of 152 postmenopausal women without any history of CVD or related symptoms. Aβ1-40 was measured in plasma by enzyme-linked immunosorbent assay. The extent of atherosclerosis was assessed using carotid high-resolution ultrasonography at baseline and after a

median follow-up of 28.2 months.
Results
At baseline, we observed that higher values of Aβ1-40 were independently associated with higher measures of carotid bulb intima-media thickness (cbIMT) and the sum of maximal wall thickness in all carotid sites (sumWT) ($p<0.05$). Aβ1-40 levels were found to increase over time and were associated with decreasing renal function ($p<0.05$ for both). Accelerated progression of cbIMT, maximum carotid wall thickness and sumWT was evident in women with a pattern of increasing or persistently high Aβ1-40 levels ($p<0.05$ for all) after adjustment for baseline Aβ1-40 levels, traditional risk factors, and renal function.
Conclusion
In postmenopausal women, the rate of progression of subclinical atherosclerosis is associated with a pattern of increasing or persistently high Aβ1-40, irrespective of its baseline levels. These findings provide novel insights into a link between Aβ1-40 and atherosclerosis progression in menopause. Further research is required to clarify the clinical value of monitoring its circulating levels as an atherosclerosis biomarker in women without clinically overt CVD.

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R06

Original Research, Oral presentation
Low testosterone is a predictor of hypoxemic respiratory insufficiency and higher mortality rate in SARS-CoV-2 hospitalized patients: A cohort study

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Objective
To evaluate the association between testosterone (T) values and clinical outcome of COVID-19.
Methods
This is a retrospective single-center study performed on 221 male patients (median age 70.5 years, range 26-93) with COVID-19 and hospitalized in our Institution between November 1st 2020 and January 31st 2021. Patients' height, weight, BMI, medical history and comorbidities were recorded; at admission, patients underwent sampling for complete blood count, inflammatory markers (C-reactive protein, Ferritin, IL-6, LDH) and gonadal hormones status (LH, T). Depending on T levels, subjects were stratified in 3 groups: normal (T > 12 nmol/l; 17 cases), borderline (T 8-12 nmol/l; 28 cases) and low (T <8nmol/l; 176 cases); central hypogonadism was defined in subjects with low T and LH below 9.4 mIU/ml (112 cases). Acute respiratory insufficiency (ARI) was defined by P/F ratio below 300 (arterial partial O2 pressure /fraction of inspired oxygen ratio) at hospital admission (Berlin definition).
Results
Compared to subjects with higher T values, patients in the low T group were significantly older ($P=0.001$) and had higher IL-6 ($P=0.001$), C-reactive protein ($P<0.001$), LDH ($P<0.001$), ferritin ($P=0.012$), lower P/F ratio ($P=0.001$) with increased prevalence of ARI ($P<0.001$) and mortality rate ($P=0.009$). When central and primary hypogonadism were compared, the latter group was found to be significantly older ($P<0.001$) and pluricomorbid ($P=0.015$), with higher mortality rates ($P=0.025$). In the multivariate regression analyses, ARI and in-hospital mortality significantly were associated with hypogonadism (OR 4.56, CI 1.22-17.06; $P=0.02$) and testosterone values (OR 0.74, CI 0.63-0.88; p 0.001), respectively, independently of age, comorbidities and inflammation.
Conclusions
This study provides convincing evidence that testosterone levels predict a negative outcome of SARS-CoV2-related pneumonia.

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R07

Original Research, ePoster
Testicular microvascular flow is altered in Klinefelter syndrome and predicts circulating testosterone: a preliminary cross-sectional study

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Background
Experimental studies on Klinefelter syndrome (KS) reported increased intratesticular testosterone (T) levels coexisting with reduced circulating levels. Abnormalities in testicular microcirculation have been claimed; however, no studies investigated *in vivo* testicular blood flow dynamics in humans with KS.
Objective
To analyze the testicular microcirculation in KS by contrast-enhanced ultrasonography (CEUS) and correlate vascular parameters with endocrine function.
Methods
We conducted 51 testicular scans in 17 testes from 10 T-naïve subjects with KS and in 34 testes from age-matched eugonadal men (CNT), who underwent CEUS for incidental nonpalpable testicular lesions. SonoVue contrast was employed, and QLAB software was used for perfusion analyses. CEUS kinetic parameters represented the main outcome measures.
Results
CEUS revealed slower testicular perfusion kinetics in subjects with KS than in age-matched CNT. Specifically, the wash-in time (Tin, 9.36 [7.54-12.73] vs. 7.42 [5.45–8.82] seconds, $P=0.008$), mean transit time (MTT, 11.8 [10.66–17.53] vs. 10.46 [8.21–12.75] seconds, $P=0.008$), time to peak (TTP, 42.3[37.85–50.47] vs. 35 [26.8–38.54] seconds, $p<0.001$), and washout time (Tout 50%, 31.51 [21.93–38.76] vs. 23.41 [16.92–29.95] seconds, $P=0.008$) were all prolonged. Faster testicular blood flow was associated with higher total T levels (rS -0.52 , $p<0.001$). Principal component analysis and multiple linear regression analyses confirmed the findings and supported a role for reduced venous blood flow as independent predictor of total T levels (b=-2.467 [-4.757, -0.1], $P=0.04$).
Conclusions
In our study we confirm an altered testicular microcirculation in men with KS, with slower venous blood flow compared to age-matched eugonadal CNT, independently predicting peripheral T release. Further studies are required to expand our findings and to establish whether CEUS may be useful in predicting the "testicular catastrophe" of KS.

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R08

Original Research, Oral presentation
Unveiling the therapeutic role of somatostatin and cortistatin in prostate cancer

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Background
Somatostatin (SST)/Cortistatin (CORT) system is a complex hormonal axis involved in the progression of several tumor types. However, its role has not been explored in prostate cancer (PCa), one of the most common type among men.
Objectives
We aimed to investigate the presence and the pathophysiological role of SST/CORT in PCa.
Methods
We analysed functional parameters in response to SST and CORT and to CORT-silencing in the normal prostate cell-line RWPE-1 and in different PCa-derived human cell lines [androgen-dependent (AD): LNCaP, and androgen-independent (AI): 22Rv1 and PC-3], which are models of hormone-sensitive and Castration-Resistant PCa, respectively. Moreover, mechanistic approaches were performed in response to SST/CORT treatment and CORT-silencing to determine the main pathways related to SST/CORT-axis in PCa cells. Additionally, in silico analysis using external databases were performed.
Results
SST and CORT inhibited proliferation and migration capacity in AI-PCa cells, but not in AD-PCa or in normal cells. Mechanistically, the antitumor capacity of these

peptides was associated to the modulation of important oncogenic signalling pathways (AKT/JNK). Among all SST-receptors, only SSTR5 was significantly overexpressed in AI-PCa cells compared to normal-cells, suggesting that the SST/CORT actions in PCa cells might be mainly exerted through SSTR5. Remarkably, CORT was highly expressed, while SST was not detected, in all prostate cell lines analysed, suggesting that CORT could be exerting antitumor actions in PCa cells through an autocrine/paracrine mechanism. In support of this, CORT-silencing drastically increased the proliferation rate of AI-PCa cells. Finally, CORT expression was correlated with key clinical parameters in two in silico cohorts.
Conclusions
Altogether, these results indicate that some elements of the SST/CORT system could be useful as a new therapeutic option in AI-PCa cells, an idea that deserve further investigation.

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R09

Original Research, ePoster
Evaluation of the urinary iodine concentration (UIC) in pregnant women using ion-pair HPLC-UV method

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Background
Pregnancy is a state of a higher iodine intake demand. Proper iodine status is important during pregnancy for fetal neurodevelopment and maternal thyroid function. Urinary iodine concentration (UIC) is the most common indicator of iodine status.
Objectives
The aim of this study was to develop and validate a novel ion-pair HPLC-UV method to measure iodine in urine and to assess iodine status in pregnant women.
Methods
Sample preparation was performed by adding sodium thiosulfate solution to convert total free iodine in urine to iodide and precipitating the protein with acetonitrile. Separation was performed on a Pursuit XRs C8 column (250×4.0 mm, 5 µm). The mobile phase consisted of a mixture of water phase (containing 18-crown-6 ether, octylamine and sodium dihydrogen phosphate) and acetonitrile in the gradient elution at a flow rate of 1.2 ml/min.
Results
All the validation data, such as accuracy, precision and stability were within the required limits. The developed method was successfully applied to measure the urinary iodine concentration in 93 pregnant women. The overall prevalence of patients with the iodine concentration in urine $<$ 150 µg/l (iodine deficiency according to World Health Organization criteria) was 71%, while 21,5% had adequate concentrations. The median UIC in all pregnant women was 127.26 µg/l (%CI: 109.55; 144.96). The median UIC in pregnant women with iodine supplementation were higher compared with those who were not taking iodine-containing supplements (133.14 µg/l, 95%CI: 109.01;157.27 vs 116.82 µg/l, 95%CI: 95.27;138.37), but the difference was not statistically significant.
Conclusions
Established and validated ion-pair HPLC-UV method permitted the urine iodine analysis in pregnant females. Iodine status was insufficient during gestation. Therefore, the knowledge and awareness of the population in the field of iodine supplementation during pregnancy should be increased.

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R10

Case Report, ePoster
Primary Amenorrhea – a case with Swyer Syndrome

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Swyer syndrome (46XY karyotype) is a rare disorder of sexual development. Patients phenotypically appear female with normal external genitalia and vagina. 14 year old girl is evaluated for primary amenorrhea. She is 176 cm and weighs 61 kg (BMI = 19.7 kg/m^2) – she has had significant growth for the past year. The girl has a vagina with 7 cm in length, there is no terminal hair or breast development (Tanner I). MRI of pelvis shows uterine hypoplasia, ovary agenesia. DXA scan reveals Z scores of -3.4. On biochemical serum assessment TSH is 1.1 IU/ml (0.48-4.17 IU/ml); estradiol $<$ 11.80 pg/ml (15.6-212.2 pg/ml); LH 38.8 U/l (0.8-29.9 U/l); FSH 73.3 U/l (1.1-9.4 U/l); 17 - OH progesterone 0.35 ng/ml (0.02-0.72 ng/ml); androstendione 0.37 ng/ml (0.3-3.3 ng/ml); prolactin 230 mU/l (84.8-439.3 mU/l); testosterone 0.04 ng/ml ($<$0.025-0.268 ng/ml); DHEA-SO4 159 µg/dL (25.2-213.9 µg/dL). The rest of examination findings are unremarkable. Cytogenetic testing shows karyotype XY, which confirms Swyer syndrome. Finding out the diagnosis, girl develops depression, she has suicidal thoughts because she thinks she will not develop fully as a woman. Patient underwent prophylactic bilateral gonadectomy. Patient is started on transdermal estrodiol 25 µg twice weekly, Colecalciferol 25 000 IU/weekly. 1.5 years later on biochemical serum assessment estrodiol is 43.7 pg/ml (21.9-297.2 pg/ml); FSH 72.6 (1.7-18.5 U/l). Breast and terminal hair development has begun (Tanner III). She is feeling better, does not want to commit suicide. Now patient asks for second opinion. Progesteone therapy is suggested to induce cycling.
Conclusions
It is reasonable to look for causes of primary amenorrhea, if no secondary sexual characteristics such as breast development have occured by age 13. Optimal hormone replacing therapy is the cornerstone to improve well-being and to prevent complications of hypoestrogenemia (e.g. osteoporosis) in adolescents diagnosed with primary amenorrhea.

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R11

Original Research, ePoster
Assessing anxiety, depression and body dysmorphia in young women with and without PCOS: the Blue Morpho Gen Y Survey

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Background
The National Institute of Health and Care Excellence (NICE) recommends evaluating emotional wellbeing in people with polycystic ovary syndrome (PCOS).
Objectives
To study differences in various aspects of emotional wellbeing among young women with and without PCOS.
Methods
Women aged 18-24 years old at the University of Birmingham were invited to complete an online survey. The survey included validated questionnaires including the Hospital Anxiety and Depression Scale (HADS; score 8-10 borderline; score $\geq$11 cases of anxiety and depression, respectively), Body Image Concern Inventory (BICI; score $\geq$72 suggestive of body dysmorphic disorder, BDD), Beliefs About Obese Persons Scale (BAOP; higher score suggestive of weight bias) and Female Sexual Function Index (FSFI; higher score suggestive of psychosexual dysfunction). The results are reported as median and interquartile ranges (IQR).
Results
A total of 52 participants completed the survey (median age: 22 years; 27% identified as White British), with 26.9% (n=14) reporting a diagnosis of PCOS, and 73.1% (n=38) reporting no known diagnosis of PCOS. People with PCOS had higher prevalence of anxiety (42.9% (n=6) with PCOS vs 5.3% (n=2) without PCOS) and depression (14.3% (n=2) in PCOS vs 18.4% (n=7) without PCOS) compared to

those without. Both groups have similar beliefs about obesity (BAOP score: 33(26.5-35) in PCOS vs 34(30-38) without PCOS) and similar body image concerns (BICI score: 60(46-73.5) vs 60(48-69.5)). Participants with a PCOS diagnosis had a higher FSFI score (25.6(9.7-37.7) in PCOS vs 18(5.7-23.9) without PCOS) compared to those without, suggesting a higher risk for psychosexual dysfunction.
Conclusion
Women with a PCOS diagnosis showed a higher prevalence of anxiety, alongside a higher HADS score for both anxiety and depression. Further research is needed to explore emotional wellbeing in young women with PCOS and address mental health concerns as part of their clinical care.

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R12

Case Report, ePoster
A difficult case of Burned-out testicular tumours: can orchiectomy be avoided?
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Background
Burned-out tumours (BOT) are rare clinical entities which present with no primary testicular lesion but distant metastases. We report a difficult management of BOT.
Case Presentation
A 22-year-old male presented to ER with acute low back pain, severe vomiting and sweating. In past medical history: bilateral orchidopexy for cryptorchidism. Abdominal CT scan displayed two retroperitoneal masses of 35 and 20 mm. The patient was discharged with suspicion of paraganglioma and he referred to our department 6 months after. In the suspicion of testicular tumor metastasis, a scrotal US was performed during the first visit, which showed multiple calcifications within the left testis. Serum tumoral markers were increased. A new CT scan showed a dimensional doubling of retroperitoneal masses. BOT was therefore hypothesized. Retroperitoneal biopsy confirmed the diagnosis of metastatic embryonal testicular carcinoma. The patient underwent first-line chemotherapy (BEP protocol, 3 cycles). Post-treatment 18F-FDG-PET confirmed hypermetabolic activity in the left para-aortic site lesion and showed an unexpected additional uptake in the right, healthy testis. Tumoral markers were negative and a new testicular US showed no focal lesions on both testicles. RPLMN was therefore performed. A new 18F-FDG PET confirmed a diffuse right testicular uptake. Again, no intratesticular mass was visible at US. Considering the non-concordance of the two diagnostic tests, in the suspicion of a false positive in testicular uptake, due to testicular cellular hyperactivity, we decided to temporarily suppress pituitary-gonadal axis with injectable testosterone undecanoate. After 3 dose every 6-8 weeks, a new 18F-FDG PET showed no areas of pathological uptake.
Conclusions
In this difficult case the suppression of pituitary-gonadal axis avoided unnecessary bilateral orchiectomy in our patient, creating food for thought on whether orchiectomy is actually necessary in these conditions.

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R13

Case Report, ePoster
Severe hyponatremia in a case of ovarian hyperstimulationSyndrome
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Background
Ovarian Hyperstimulation Syndrome(OHSS) complicates up to a third of assisted reproduction cycles. Severe hyponatremia is a rare complication of OHSS. We report a case of severe hyponatremia to highlight the challenges in management.
Case Report
31 year-old female presented with breathlessness, abdominal pain, increased abdominal girth and hyponatremia (sodium 122 mmol/l) eight days following embryo transfer after ovulation induction with gonadotropins. On examination she had moderate dehydration, reduced bi-basal air entry and ascites. She received 1 litre 0.9% normal saline (NS) and 1litre Hartman's solution. Repeat investigations showed sodium 121 mmol/l, plasma osmolality 263mOsm/kg, urine osmolality 431mOsm/kg, urine sodium < 20mEq/l, random Cortisol 607nmol/l, TSH 8.19mU/l and free T4 21.3pmol/l, indicative of hypovolemic hyponatremia and subclinical hypothyroidism. Chest x-ray showed bilateral moderate pleural effusions. She was started on Levothyroxine. She had 3litres NS and 2units of human albumin solution over 48hours. She had ascitic drainage (6 litres). Hyponatremia worsened with repeat sodium 117 mmol/l. She was given 300 mls 1.8% hypertonic saline and repeat sodium was 114 mmol/l. With no improvement, she was given a trial of Tolvaptan 15 mg for two days. Sodium increased to 128 mmol/l and Tolvaptan was stopped. Weight, abdominal girth, and fluid balance were monitored closely. HCG testing confirmed pregnancy. Two days after discharge she was re-admitted with ascites and underwent paracentesis. She had euvolemic hyponatremia (sodium 132 mmol/l) which improved spontaneously.
Conclusion
Severe OHSS can present with severe hyponatremia due to increased vascular permeability and loss of fluid into the third space. Intravenous fluid replacement is essential to address the acute need for volume expansion. In case of refractory hyponatremia despite aggressive fluid resuscitation, treatment with hypertonic saline or Tolvaptan should be considered.

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Thyroid

T01

Case Report, ePoster
Hypothyroidism and COVID-19 case report
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Background
COVID-19 is the pandemic of the new millennium. COVID-19 patients with comorbidities including hypothyroidism could develop a life-threatening situation. We would like to introduce the clinical manifestations of hypothyroidism that can aggravate COVID-19.
Case Presentation
A 78-yo woman was admitted to Heratsi University hospital with general weakness and shortness of breath. She had a history of Hypertension and Paroxysmal atrial tachycardia. Examination revealed BMI = 31.2kg/m^2, Ps = 54bpm, BP = 190/110mmHg, T = 36.60C, SpO2 60 % (O2-),90% (O2 +). An ECG showed sinus bradycardia, complete RBBB. An Echocardiography showed severely concentric hypertrophy. EF40-45%. Pericardial effusion without tamponade. SARS COV-2PCR test positive. Chest CT showed bilateral pneumonia with a typical viral etiology, lesions up to 40%, right hydrothorax, expressed hydropericardium. Deviated lab results: Red blood cells (1012/l) -3.58 (N 4.20-6.20), Hemoglobin (g/l)-96 (N 120-170), Leucocytes (109/l)-3.67 (N 4.0-10.0), ESR (mm/hr)-51 (N 2-15), Total protein (g/l)-61.7 (N 65-85), T. Cholesterol (mmol/l)-6.02 (N < 5.2), CRP (mg/dL)-3.795 (N < 0.5), LDH (mmol/l)-399.5 (N 120-240), Prothrombin time (s)-16.2 (N 12-16), Fibrinogen (g/l) -4.67 (N 2-4), TSH (mlU/ml)-73.19 (N 0.27-4.2), FT4 (pg/ml)-0.946 (N 10-24), Anti-TPO (mm/ml)-386.5 (N < 35).
Diagnosis
Autoimmune thyroiditis. Hypothyroidism, manifestation. Sars-cov-2.
Treatment given
Levothyroxine 12.5 mkg (2days), 25 mkg (3days), 37.5 mkg (7days), then 50 mkg, Ramipril, Furosemide, Hydrochlorothiazide, Amlodipine, Spironolactone, Heparin, Famotidine, Remdesivir, Infusion therapy. The patient improved on treatment.
Conclusion
Serous effusions have been thought to be not very frequent complications of hypothyroidism. In our case, pleural and pericardial effusions because of undiagnosed and untreated hypothyroidism caused desaturation and aggravated COVID-19.

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T02

Original Research, ePoster
Selenium can decrease TPO Antibodies giving rise to Hashimoto thyroiditis remission chance
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Introduction
Hashimoto thyroiditis is the prominent face in thyroid diseases, and it is considered as an autoimmune disorder, in which the immune system develops antibodies against thyroid peroxidase enzyme which has a role in thyroid hormone production. No treatment for hashimoto thyroiditis itself, only patients with low thyroid hormone with high TSH levels require treatment with thyroxin. It is known that about 25 genes converting data regarding selenoproteins are present in the human chromosomes, in which providing many functions to the human body. Thyroid gland has selenium content more than all other organs in the human body, which indicate a great value of selenium in thyroid metabolic processes(Also thyroid cells have considerable content of selenoproteins like deiodinase isozymes type 1 and 2. Selenium nutritional supplement by a dose of 200 mg daily for hashimoto thyroiditis patients to evaluate if it can decrease TPO antibodies and can improve thyroid function. Design: Randomized, controlled trial, 6 month trial.
Materials and methods
100 patients with hashimoto thyroiditis disease were randomized into 2 parallel groups, had been monitored in a private clinic, number 50 each group, with 35 females and 15 males after the written consent of all patients. The first group was on eltroxin therapy and they received selenium nutritional supplement 200μg per day. The second group was only on eltroxin therapy.
Results
The results show a statistically significant decrease of TPO antibodies after 6 months of treatment with selenium and eltroxin. With *P*-value <0.0001 with 45 patients exhibited a significant reduction of anti-TPO antibodies and non-significant change in anti TPO antibodies level in the control group with *P*-value 0.9897 with only 3 patients exhibited a significant reduction of anti-TPO antibodies. The results also show a statistically significant decrease in TSH level in group 1 after treatment with eltroxin and selenium for 6 months with a *P*-value <0.0001. And also significant change in TSH levels in the control group with *P*-value <0.0001.
Conclusion
Selenium can improve thyroid gland function and may lead to hashimoto disease remission.

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T03

Case Report, ePoster
A case of Hashimoto thyroiditis and membranoproliferative glomerulonephritis

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Background
Hashimoto thyroiditis is the most common autoimmune disease, with a marked prevalence in women. Occasionally, it may be associated with renal disease. Most described renal lesion in patients with autoimmune thyroiditis is membranous glomerulonephritis.
Case
A 32 years old Caucasian man consulted the endocrinologist with a 4 months history of progressive fatigue, headache, arthralgia, dryness of skin and increased weight of approximately 10 kg during the preceding year. Medical history was remarkable for autoimmune thyroiditis and non-treated subclinical hypothyroidism. Laboratory analysis showed severe hypothyroidism: TSH 83.98, free T4 0.48 ng/dl, positive anti-thyroid peroxidase antibodies (897 UI/ml), and hyperlipidemia: total cholesterol 8.92 mmol/l, Ldl-cholesterol 6.99 mmol/l, triglycerides 2.15 mmol/l, hypoproteinemia: total proteins 59.8 g/l, an increased Erythrocyte Sedimentation Rate (26 mm/h) and a normal creatinine level (105 μmol/l). Urinalysis showed nephrotic range proteinuria (5 g/l) and microhematuria: 2-3 blood cells/high power field. Additional serological investigations excluded a systemic disease. Therefore a renal biopsy was performed which revealed type 2 membranoproliferative glomerulonephritis (MPGN). Oral prednisone at 60 mg daily (with gradual decrease thereafter), an angiotensin-converting enzyme (Ramipril 5 mg/day) and thyroid replacement therapy (1.6 mg/kg/day) have been initiated. Following treatment the patient improved significantly both clinically and biochemically.
Conclusion
MPGN in association with autoimmune thyroiditis is a rare but severe condition. Our patient had an unusually prolonged and severe loss of thyroid function. Thyroid hormones have an important role in the maintenance of normal renal architecture and function. Renal disease secondary to hypothyroidism may be in part reversible, and it should be considered during the diagnostic evaluation of patients with hypothyroidism.

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T04

Original Research, Oral presentation
Management of Hyperthyroidism in Pregnancy: A single center experience

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Background
Overt hyperthyroidism can have a negative impact on pregnancy's outcome, if not correctly treated. Furthermore anti thyroid treatment are burned by possible side effects.
Objectives
We describe the experience of our center in the management of endogenous hyperthyroidism in pregnancy. evaluating the effects of the disease and treatments on fetal and maternal health.
Methods
We observed 36 pregnancies (4 twins and 1 triplet, 42 fetuses in total). 31 women had active hyperthyroidism, 5 had a history of Graves' disease (GD). All patients with a history of GD were on LT4. We excluded women who hadn't ended their pregnancy at the closure of the study. Clinical and biochemical data on maternal and newborn status were collected . According to the etiology of the hyperthyroidism, pregnancies were divided into: GD (17), multinodular toxic goiter (MNG) (4), gestational hyperthyroidism (GH) (10). We also wanted to evaluate the effect of a personal history of GD (HGD) (5).
Results
Hypertension occurred in 6 out of 30 pregnancies (4 GD, 2 GH). Pre-eclampsia complicated 2 pregnancies (1 GB, 1 IG). Placental abruption occurred in one patient affected by GD. No cases of cardiac insufficiency occurred. Pre-term delivery occurred in 16.6% of pregnancy (3 GD, 1 GH, 1 HGD).Only 3.3% of pregnancy were complicate by intrauterine growth restriction (1 GH), and only 6.29 had a lower birthweight (1 GH, 1 GD). 4 newborns were affected by fetal goiter (3GD, 1 HGD). 5 newborns were affected by hyperthyroidism (3 GD, 2 HGD). A natural fetal abortion occurred at the 16th week of gestation in a GD patient. Patients on thioamides did not developed any drug related side effect.
Conclusion
A careful management of hyperthyroidism can reduce the risk of complications. We confirmed that hypertension is more common in hyperthyroid patients than euthyroid. Our data showed that some complications are related to hyperthyroidism while others depend on the etiology of hyperthyroidism.

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T05

Case Report, Oral presentation
An unusual case of a solitary adrenal metastasis of thyroid carcinoma

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Backgroud
Distant metastases from papillary thyroid cancer (PTC) are infrequent and associated with poor prognosis. Adrenal metastatic lesions in this setting are rare, generally associated with lung and skeletal metastases. There have been few reported cases of isolated adrenal metastases from thyroid carcinoma. Here we report a patient with a PTC who developed a large and solitary adrenal metastasis.
Case Presentation
A 68-year-old men was submitted in 2015 to total thyroidectomy and left cervical lymphadenectomy due to a 48mm left thyroid nodule with a cytological diagnosis of PTC. The pathology revealed a classic and follicular variant of PTC with extensive angioinvasion and cervical lymph node metastases. He was submitted to treatment with 100mCi of radioactive iodine (RAI). Due to recurrent lymph node disease, in 2017 he underwent a right cervical lymph node dissection, followed by a second RAI treatment (100mCi). The whole-body scan performed 2 days after this treatment did

not show any anomalous uptake. In 2018 a third surgery with left cervical lymph node dissection was performed. After that he showed no evidence of disease, with an undetectable level of thyroglobulin (Tg) and negative anti-thyroglobulin antibodies. Six years after the diagnosis (2021) the serum Tg increased from undetectable to 1758 ng/ml. A PET/TC-18FDG showed a single anomalous uptake at the left adrenal gland (SUVmax of 15.4). A left adrenalectomy was then performed, revealing an adrenal metastasis (100x80x50mm) of poorly differentiated thyroid carcinoma, with solid and insular pattern. One month after surgery, Tg level dropped to 24 ng/ml. The patient is scheduled for a third RAI treatment.
Conclusions
This patient represents a very rare case of an initially well differentiated thyroid carcinoma with a single distant metastasis in the adrenal gland which had a poorly differentiated pattern. This reinforce the importance of long-term surveillance with serum Tg levels.

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T06

Case Report, ePoster
Ectopic Cushing's syndrome due to advanced medullary thyroid cancer: a case report

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Background
Cushing's syndrome (CS) in medullary thyroid cancer (MTC) is rare with less than 60 cases reported. Less than 1% of MTC develop ectopic ACTH-dependent CS and this correlated with metastasis at diagnosis and poor prognosis.
Case presentation
A 32-year-old male was referred to our department for suspected CS. Initial evaluation showed hypokalemia(2.4 mmol/l) and severe ACTH-dependent CS (Cortisol h8:678ng/ml; ACTH:249pg/ml; urinary free cortisol:13827mg/24h, night salivary cortisol:16.7mg/dl; cortisol after 1 mg-dexamethasone:750ng/ml). Both 8 mg-dex suppression test and CRH stimulation were indicative of ectopic CS. Thyroid ultrasound was suspicious for cancer with cervical lymph nodes metastasis. MTC was confirmed by citology, calcitonin >20.000pg/ml and CEA 3054.2ng/ml. Urinary metanephrines and germline RET analysis were normal. Gallium-68 PET/CT revealed metastases in bone, lungs and liver. The patient developed worsening hypokalemia, despite I.V. KCl 120mEq/day and canrenone 200 mg bid, and severe psychiatric symptoms that required urgent bilateral adrenalectomy. Intraoperative liver biopsy showed localization of MTC with ACTH expression at immunohistochemistry. After surgery the patient started cortisol and fludrocortisone therapy and had a rapid recovery. He later underwent total thyroidectomy with bilateral cervical node dissection. Histology confirmed multifocal MTC with infiltration of the left laryngeal recurrent nerve (pT4aN1b). Systemic therapy with lanreotide 120 mg/28 days and vandetanib 300 mg/day was initiated. At 6 months, CT scan showed stable disease. The patient is in good clinical conditions and is continuing treatment.
Conclusion
This case underlines the effectiveness of emergency bilateral adrenalectomy for management of severe hypercortisolism. Improvement in patient conditions allowed initiation of therapy for MTC. Considering the severe evolution of MTC with ectopic CS, we preferred systemic treatment for this young patient.

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T07

Case Report, ePoster
Thyrotoxic storm and Hypercalcemia: A Graves' complication

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Introduction
Graves' disease is associated with mild hypercalcemia in about 1/5th of cases. T3, through its nuclear receptor activates osteoclasts resulting in accelerated bone turnover. Although mild hypercalcemia is common in Graves' disease, symptomatic hypercalcemia is rare. We describe a case who presented with thyrotoxic storm and hypercalcemia.
Case report
52-year-old lady presented with thyrotoxic symptoms of weight loss, dysphagia for 2 weeks. She had noticed painless neck swelling 3 months ago. She was a hypertensive, was on amlodipine. On examination, she had tachycardia (150/min), elevated blood pressure of 170/100 mm of Hg, fine finger tremors, a goitre measuring 12x6cm. She had a hoarse voice and was anxious. She had paraparesis of both legs. Other systemic examination was normal. Burch-Wartofsky score was 45 indicating thyroid storm. She was admitted in intensive care unit, investigations revealed suppressed TSH-0.015IU/ml, elevated free T4 >90pmol/l, free T3 >53.77pmol/l and TSH receptor antibody >40IU/l. At presentation, her serum corrected calcium level was 3.24 mmol/l (2.13-2.63), phosphorous-0.71 mmol/l, 25(OH) vitamin D was 91.4ng/ml, low PTH of 15pg/ml. Renal and liver functions, serum protein electrophoresis were normal. MRI of the spine revealed intervertebral disc prolapse at the level of L4-L5. She was started on propylthiouracil, propranolol, dexamethasone. Adequate hydration with 0.45% normal saline was done. Serum calcium, phosphorous and free T4 levels were monitored regularly. Her calcium levels gradually improved and on discharge, after 4 weeks her calcium was normalized (2.55 mmol/l). Free T4 at the time of discharge was 9pmol/l. On follow up, her thyroid functions and calcium were normal.
Conclusion
Hypercalcemia is rare in Graves' disease and might be overlooked. In case of thyrotoxic storm, it is important to assess calcium level. High-normal vitamin D level may act as a risk factor for hypercalcemia in Graves' disease.

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T08

Case Report, ePoster
Antibody Interference in Thyroid Assays: a case report

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Background
Endogenous and exogenous factors may cause biochemical interferences with thyroid function immunoassays. Interference can be caused by many mechanisms including heterophilic antibodies, drugs and rheumatoid factors. Moreover, assay-specific interference has been described, such as antithyroid hormone antibodies resulting in falsely elevated or lowered concentrations depending on the assay.
Case Presentation
We describe a case of a 38-years old man who came to our attention showing FT3: 76.9pmol/l; FT4: 27.64pmol/l: TSH: 5mUI/ml. Anti-thyroid antibodies were positive. The patient resulted affected by inappropriate secretion of TSH (IST). He had no clinical evidence of hyperthyroidism or hypothyroidism. The thyroid ultrasonography was normal. He had no personal or familiar history of thyroid disease and did not take medication. The differential diagnosis includes: thyroid hormone resistance, TSH-secreting pituitary adenoma. However, this condition can also be caused by medications or analytical problems due to interfering antibodies. Thus, before performing further tests, we repeated thyroid assay and fT3, fT4 and TSH were normal, confirming the suspicion of an interference in the first results. In fact, the first laboratory used a competitive electrochemiluminescence immunoassay with ruthenium complex-labeled antibody (Roche Cobas), while our laboratory employed a competitive chemiluminescence immunoassay with acridinium ester-labeled antibody (Siemens ADVIA Centaur).
Conclusions
The possible presence of antiruthenium antibodies can falsely elevate fT4 and fT3, in rare cases even of TSH. These erroneous results potentially lead to unnecessary, expensive and possibly harmful investigations and treatment. Therefore, it is mandatory to consider the relationship between fT3, fT4, TSH levels and clinical background and discrepancies should be evaluated repeating

thyroid assay using a different immunoassay, especially in patients with an autoimmune disorder.

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T09

Case Report, ePoster

Unmasking the pseudo-myaesthenic imposter

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Background
Myasthenia gravis and thyroid disease can sometimes create diagnostic confusion because the two may have similar clinical features and may also co-exist in the same individual.
Case
A 68 years male, was seen in the Neurology clinic with drooping of his left eyelid, first noticed 8 months prior, worse in the evenings. There were no other complaints. He had history of type2 diabetes, and Graves' disease. On examination, he appeared to have ptosis of his left eyelid; eye movements and visual field examination being normal. There was fatigable diplopia on sustained upward gaze. Fundoscopy was normal. The remaining neurological examination was unremarkable, except for slight fatigue in shoulder abduction and neck flexion. Reflexes were symmetrical but suppressed distally. The symptoms seemed consistent with myasthenia gravis. He was commenced on Pyridostigmine which made him feel significantly better. However, routine blood tests, Myasthenia antibodies, and nerve conduction tests done to elucidate the diagnosis were normal on two occasions. This was against the initial picture of myasthenia gravis. On subsequent review he had developed proptosis in the right eye that was almost certainly secondary to Graves' disease. It was challenging now to determine whether he had ptosis on the left side, or just proptosis on the right. He did not have any fatigable diplopia or ptosis on sustained upward gaze this time, nor limb fatigue. MRI head showed features of thyroid eye disease and normal optic nerves.
Conclusion
Thus, what he was noticing over the past year was progressive right eye proptosis rather than ptosis in the left. He was referred to the Endocrine clinic and is now on Carbimazole and awaiting Ophthalmology review.

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T10

Original Research, Oral presentation

Mutational profile of a series of sporadic medullary thyroid carcinoma patients with metastatic - persistent disease

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Background
Tyrosine Kinase Inhibitors show great promise in the management of metastatic Medullary Thyroid Carcinoma.Somatic mutations are considered to play a major role in the response/resistance to therapies.RET-somatic mutations are present in 45-75% of sporadic MTCs while RAS are rarer.
Objectives
The aim of this study is to investigate the mutational profile of 18 spMTC pts, with metastatic/biochemical persistent disease and to look into possible associations with the response to TKIs treatment.
Methods
37/191 spMTC pts,presented with biochemical persistent or metastatic disease.In 18/37pts, FFPEs were obtained. DNA was extracted & NGS libraries were constructed for the sequencing. Data analysis,including alignment to the hg19 human reference genome and variant calling,was performed using the Torrent Suite Software(ThermoFisher).
Results
11/18pts(61.1%) harboured a RET somatic mutation(RET-pos),(Variant Allele Frequency:19.17-42.39%), while 5/11 carried also Variants of Uncertain Significance. The majority of our mutated spMTCs harboured the RET-M918T mutation (8/11,72.72%); in 3 pts the following RET mutations were detected: C634A, C630A, V804M. Coexistence of (a) RET-M918T & MTOR (b) RET-V804M & TP53 mutation with presentation of brain metastases, was detected in 2 patients. 5 pts (3/5 RET-pos) presented with biochemical persistent disease while distant metastases were present in 13 (8/13 RET-pos). 9 pts (5/9 RET-pos & 4/9 without mutation) are under TKIs treatment (Vandetanib $n=6$,Cabozatinib,Lenvatinib, Selpercatinib). Out of 9pts under TKIs, 4/5 harbouring the RET-M918T & 2/4 without mutation, show partial response. 3 pts developed resistance to Vandetanib; one with the "gatekeeper" RET-V804M and two without mutation.
Conclusions
The frequency of RET somatic mutations found in our cohort is consistent with literature.Tumor molecular profiling can provide crucial information regarding disease progression and response to targeted therapies in metastatic MTC patients.

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T11

Case Report, ePoster

Safety profile of Lenvatinib treatment in a mildly symptomatic Covid19 patient

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Background
Lenvatinib is an oral chemotherapy for metastatic radioiodine-refractory differentiated thyroid cancer (RRDTC) which significantly improves progression free survival (PFS). It has been proved that higher rates of dose interruption or reduction of Lenvatinib have a negative impact on PFS. Patients with active cancer, such as RRDTC, have an increased risk of contracting Severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) and developing complications, especially in case of lung involvement. It is necessary to evaluate a safe continuation of anti-cancer treatment during infections and intercurrent illness.
Case Presentation
A 74-year-old male patient was treated with Lenvatinib (18 mg/day) for advanced RRDTC (recurrence in the thyroid bed and multiple lung metastases) since March 2019. He showed partial response to treatment, with a progressive reduction of metastases. In September 2020, the patient tested positive for SARS-CoV2. After a few days, he developed mild symptoms (cough, diarrhea and asthenia). We decided not to discontinue Lenvatinib treatment and to monitorate vital signs in telemedicine daily. After 21 days, the patient tested negative for SARSCoV2 and he experienced no severe respiratory, gastrointestinal or hematologic complications.
Conclusions
Patients with cancer usually have comorbidities, with an increased risk for COVID-19 morbidity and mortality. Continuing Lenvatinib should be favoured, if possible according to the clinical setting. Careful monitoring of both COVID19 symptoms and anticancer adverse events are important for assessing treatment continuation. As data is limited, this report is an important indicator of the safety of continuing Lenvatinib treatment during the SarsCov2 infection and could be more widely generalized for other oncologic patients with COVID19. Studies with larger samples and longer follow up are required to determine the safety of continuing anti-cancer treatment during COVID19.

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T12

Case Report, ePoster

Febrile Neutropenia due to methimazole: a case report

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Background
Agranulocytosis is rare and may develop in 0.2–0.5% patients using antithyroid drug therapy (ATD). We report on a patient who developed febrile neutropenia two weeks after starting treatment with methimazole.

Case Report
A 74-year-old female, with no relevant medical history, was diagnosed with Graves disease and treated with methimazole (30 mg/day). Three weeks after starting therapy she presented to the emergency department with complaints of fever, fatigue and odinophagia since the past 5 days. Her vital signs were: arterial blood pressure 95/46mmHg; pulse, 120 beats/min and temperature 39.1°C. She had multiple painful cervical adenopathies and erythematous plaques on elbows and knees. Admission laboratory results revealed hemoglobin 11.4 g/dl, white count 0.4×10^9/l, 11 neutrophils (2.8%), platelets count 116×10^9/l and C reactive protein (CRP) 26.5 mg/dl. Renal and hepatic function were normal. Serologies, blood and urine cultures were negative. The patient was hospitalized with the diagnosis of febrile neutropenia and methimazole was suspended. Filgrastim, beta-blocker, antifungal and antibiotics (piperacilina-tazobactam and vancomicin) were prescribed. Agranulocytosis resolved within 4 days. Total thyroidectomy was done and Lugol's solution was used in the preoperative management. Previous to surgey thyroid laboratory results showed TSH 0,009 μUI/ml FT3 2,72 pmol/l and FT4 9,81pmol/l. There were no surgery complications. Nowadays the patient has no symptoms.
Conclusion
Febrile Neutropenia due to methimazole is rare but potencially fatal so to inform the patient of the symptoms of this complication is fundamental. All patients receiving ATDs should be advised to seek immediate medical attention for signs of infection, including fever and sore throat.

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Obesity, Metabolism & Miscellaneous Endocrinology

O01

Original Research, ePoster
What dietary patterns contribute to obesity in children and adolescents aged 3-17 years in china: A systematic review
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Objectives
The aim is to systematically review the evidence among the eligible primary studies in which the relationship between dietary patterns and risk of obesity/overweight in children and/or adolescents aged 3-17 years in China was assessed.
Methods
Bibliographic databases such as Medline (Ovid), were searched. Medical Subject Headings (MeSH) terms, synonyms or alternative terminologies, acronyms were included. The quality of included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for cross-sectional studies and the Newcastle-Ottawa Scale (NOS) for retrospective cohort studies. The adjusted ORs compared the highest quartile with the lowest quartile of Chinese traditional dietary pattern and western pattern were pooled in forest plots to visualise results.
Results
Among 7 studies included for final analysis, four indicate that greater adherence to a western dietary pattern was significantly positively associated with obesity in children/adolescents aged 3-17 years in China after adjustment of confounding factors. The magnitude of effect varied from study to study: the odds ratios and 95% CIs ranged from (Q4 vs Q1) OR = 1.49, 95% CI: 1.21,1.84 to (Q4 vs Q1) OR = 3.10, 95% CI:1.52, 6.32. This positive association is demonstrated in the animal foods, fats, and condiments dominated pattern in a borderline trend (Q4 vs Q1) OR = 5.88, 95% CI 1.39, 24.80). One study suggested that greater adherence to the Chinese traditional dietary pattern was significantly associated with a lower risk of obesity (Q4 vs Q1) OR = 0.19, 95% CI: 0.09, 0.40.
Conclusion
Given the balance of evidence, this systematic review demonstrates that western dietary patterns characterised by high fat, low dietary fibre, were associated with a higher risk in obesity/overweight in children and adolescents aged 3-17 years in China. Fruits and vegetables dominated dietary patterns were associated with a lower risk of obesity in children and adolescents aged 3-17 years.

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O02

Original Research, ePoster
A systematic review and meta-analysis of postoperative complications and outcomes in OAGB (one anastomosis gastric bypass) vs. RYGB (Roux-en-Y gastric bypass)
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Objectives
To report outcomes comparing RYGB (Roux-en-Y gastric bypass) and OAGB (one anastomosis gastric bypass) on patients with obesity. To further investigate the efficacy of OAGB, given that there is significant interest in OAGB as it has reported reduced operating time, better weight loss and increased remission of obesity-related comorbidities. However, there are concerns over potentially serious postoperative complications causing limited uptake.
Methods
We searched OVID Medline, EMBASE and the Cochrane Library databases from inception to November 23, 2020 for studies comparing OAGB and RYGB. The primary outcomes extracted were excess weight loss, remission rate of comorbidities and postoperative complications/adverse effects. For risk of bias assessment, ROBINS-I (Risk Of Bias In Non-randomized Studies of Interventions) and Cochrane Collaboration's tool were used for cohort study and randomized controlled trials (RCTs) respectively. The current review has been submitted to PROSPERO (ID: CRD42021233284).
Results
We identified 4 RCTs and 34 cohort studies for meta-analysis, with a total number of 126,248 patients. The risk of bias was low for 8 cohort studies and 3 RCTs, moderate for 13 cohort studies, and serious for 13 cohort studies and 1 RCT.
Conclusions
As part of this ongoing systematic review and meta-analysis, we have identified a large number of studies to answer our clinical question and better inform patient care.

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O03

Original Research, ePoster
The estimated glucose disposal rate as a potential biomarker for non-alcoholic fatty liver disease and cardiovascular disease in type 1 diabetes
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Background
Patients with type 1 diabetes (T1D) have an increased risk of cardiovascular disease (CVD), despite insulin therapy. Insulin resistance is strongly associated with non-alcoholic fatty liver disease (NAFLD) and CVD. The euglycemic clamp, the gold standard to assess insulin resistance in T1D, is unsuited for clinical practice. The estimated glucose disposal rate (eGDR) is increasingly used as an alternative in T1D, but its role as a NAFLD or CVD predictor is unexplored.
Methods
T1D subjects were screened for steatosis with ultrasound (US), Fatty Liver Index (FLI) and controlled attenuation parameter (CAP). CVD was defined based on documented events.
Results
CVD was present in 34 out of 355 subjects. Divided into tertiles (<5.39, 5.39–7.79, >7.79), 36.6% expressed low eGDR; 32.7% intermediate eGDR and 30.7% high eGDR. The eGDR is inversely associated with insulin resistance. There was moderate correlation between eGDR and FLI (r 0.68, $P<0.001$) and weak correlation with US (r 0.33, $P<0.001$) and CAP (r 0.50, $P<0.001$). In the low eGDR group (=insulin resistant group) was not only steatosis (38.5% vs. 11.2% (intermediate eGDR) and 12.8% (high eGDR)), but also composite CVD (18.5% vs. 6.0% and 2.8%) significantly more present ($P<0.001$ for both). Low eGDR (OR: 4.2 [2.2–8.2], $P<0.001$), but not BMI or dyslipidaemia was independently associated with US-defined NAFLD. Low eGDR was also independently associated with FLI-determined NAFLD (OR: 5.5 [1.7–17.6], $P=0.004$) together with BMI (OR: 1.6 [1.4–1.9], $P<0.001$). Low eGDR (OR: 8.0 [2.3–27.4], $P=0.001$) and NAFLD (OR: 2.7 [1.2–6.1], $P=0.022$ (US-defined), OR: 2.9 [1.4–6.0], $P=0.005$ (FLI-defined)) were independently associated with CVD, but presence of metabolic syndrome, dyslipidaemia and BMI were not.
Conclusions
Insulin resistance is prevalent in T1D. eGDR correlates with the presence of NAFLD. Both eGDR and NAFLD correlate with major cardiovascular adverse events.

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O04

Original Research, Oral presentation

Unleashing the crosstalk between prostate cancer and obesity: miR-107 as a novel personalized diagnostic and therapeutic tool

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Background
Prostate cancer (PCa) is one of the most common causes of cancer-related deaths in men worldwide. Early detection of PCa faces severe limitations as PSA displays poor-specificity. Therefore, new diagnostic and therapeutic alternatives are urgently needed.
Objectives
This work was aimed to investigate the miRNA landscape in PCa and explore their putative diagnostic/therapeutic utility.
Methods
The miRNome of plasma samples from healthy ($n=18$) and PCa patients ($n=19$) was initially determined using an Affymetrix-miRNA array. The main changes were validated in an independent cohort ($n=380$) by qPCR. Additionally, in silico and in vitro assays in normal prostate and PCa cell lines were performed.
Results
The results revealed that the level of 104 miRNAs were significantly altered ($p<0.01$) in plasma samples from PCa patients compared with controls. Of note, 6 of these miRNAs exhibited a ROC curve capable to perfectly distinguish between control and PCa patients (AUC = 1). The validation using an independent cohort demonstrated that miR-107 was the most profoundly altered miRNA in PCa (AUC = 0.75). Interestingly, miR-107 outperformed the ability of PSA to distinguish between control and PCa patients, as well as between non-significant (Gleason-Score = 6) and significant (Gleason-Score $\geq$ 7) PCa patients, being its expression correlated with relevant clinical parameters (PSA and testosterone levels, tumor volume). All these comparisons were even stronger in obesity patients (BMI > 30). miR-107 levels were also dysregulated in PCa tissues (compared to non-tumor tissues) and in PCa cells (compared to non-tumor cells). Finally, overexpression of miR-107 reduced tumor parameters and altered the expression of FASN/CPT2 (implicated in lipid metabolism) and SRRM1/SRSF2/TIA1 (involved in splicing process) in PCa cells.
Conclusions
Altogether, these results indicate that miR-107 could represent a new diagnostic/therapeutic tool in PCa, especially under obesity condition.

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O05

Original Research, Oral presentation

In1-ghrelin as a key element in the pathophysiological association between obesity and prostate cancer

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Background
Prostate cancer (PCa) diagnosis is based on the serum levels of prostatic specific antigen (PSA), which might be influenced by many clinical conditions, including obesity. In addition, the diagnostic capability of PSA test dramatically drops when considering patients with PSA levels lower than 10ng/mL (i.e. "grey-zone"). Therefore, the identification of more reliable non-invasive diagnostic biomarkers for PCa is a critical unmet clinical need. In this scenario, the potential diagnostic capacity of urine In1-ghrelin, a splicing variant derived from ghrelin gene with an oncogenic role in PCa, has not been explored yet, neither its potential relation with adverse metabolic conditions.
Objectives
To assess the putative relation of urine In1-ghrelin levels with metabolic-related pathological conditions (e.g. obesity, diabetes, BMI, insulin or glucose levels), and to define its potential clinical value for PCa patients with PSA in the grey-zone.
Methods
Urine In1-ghrelin levels were determined by RIA in a metabolically well-characterized cohort of patients with PSA in the grey-zone ($n=600$).
Results
In1-ghrelin levels were strongly correlated with those of key obesity-related parameters, including BMI, diabetes, glucose and insulin among others. Moreover, high In1-ghrelin levels were associated with increased PCa-risk and linked to PCa aggressiveness parameters (e.g. tumor stage and perineural invasion). Remarkably, a multivariate model consisting of key clinical and metabolic variables, including In1-ghrelin levels, showed high specificity/sensitivity to diagnose PCa (AUC = 0.740).
Conclusion
Our results indicate the association of urine In1-ghrelin levels with obesity-related factors and PCa-risk/aggressiveness. Additionally, this study poses the potential for urine In1-ghrelin levels as a useful clinical diagnostic/prognostic biomarker of PCa in patients with PSA in the grey-zone.

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O06

Original Research, ePoster

Somatostatin and ghrelin systems characterization reveals a central role in chronic liver disease

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Background
Hormonal signalling plays a key role in the progression of non-alcoholic fatty liver disease (NAFLD) to hepatocellular carcinoma (HCC). However, the role of somatostatin (SST), cortistatin (CORT), neuronostatin (NST) and ghrelin systems in NAFLD-HCC progression has not been elucidated.
Objectives
To characterize the role of SST/CORT/NST and ghrelin systems in chronic liver disease and evaluate its clinical potential.
Methods
The expression of the SST/CORT/NST/ghrelin system components was analysed in retrospective cohorts [cohort 1 ($n=93$) and cohort 2 ($n=58$), HCC vs. adjacent; cirrhosis ($n=39$), and healthy livers ($n=5$)], in liver-derived cell lines (HepG2, Hep3b, SNU-387), in mouse models of NAFLD/non-alcoholic steatohepatitis (NASH)/cirrhosis and on in silico HCC cohorts (mRNA/protein). Proliferation after treatment with SST/CORT/NST and ghrelin (natural and synthetic peptides) was evaluated in cell lines and human liver primary cultures.
Results
Chronic liver disease is characterized by a progressive overexpression of SST and GPR107 (the NST receptor), the downregulation of SSTR1 and the stage-dependent alteration of CORT, SSTR2, GOAT-enzyme and GHSR1b from cirrhosis to HCC. Animal models of NAFLD/NASH exhibited SSTR3 and

GRP107 overexpression and SSTR1, SSTR2 and ghrelin downregulation. GPR107 overexpression was validated in silico and correlated with aggressiveness (survival, tumor diameter, proliferation markers). In vitro assays revealed a receptor pattern-dependent decrease in proliferation of cell lines and primary cultures in response to SST, CORT, NST and SST analogues.
Conclusions
This study demonstrates an alteration of the SST/CORT/NST/ghrelin systems in human, animal, and cellular models of chronic liver disease, and suggest a potential prognostic/therapeutic role of some components, including SST-analogues and GPR107 in liver pathologies.

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O07

Original Research, ePoster
Dietary patterns as risk factor for arterial stiffness and carotid atherosclerosis in menopause

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Background
Apart from traditional cardiovascular-risk factors and fluctuating sex hormone levels, environmental and lifestyle factors might also contribute to the heightened cardiovascular risk after menopause.
Objective
To explore whether nutritional factors are associated with subclinical vessel disease in postmenopausal women.
Methods
This cross-sectional study recruited 310 apparently healthy postmenopausal women, attending a University Menopause Clinic. A validated food frequency questionnaire and the MedDietScore were used to evaluate the dietary habits. Anthropometric/biochemical indices including the Triglyceride-glucose index (TyG-Index), body fat distribution [triceps skinfold (TSF), mid-upper arm circumference (MUAC)] and physical activity were evaluated. Carotid-femoral pulse wave velocity (PWV), carotid and femoral-artery intima-media thickness (IMT) and atheromatous plaques presence were assessed.
Results
Dietary intake associated with indices of subclinical atherosclerosis. Nut intake was associated with combined-carotid IMT (b-coefficient = -0.091; $p = 0.03$). Non-refined cereals intake associated with carotid-bulb IMT (b-coefficient = -0.105; $P = 0.02$) after adjusting for age, physical activity, lipids, systolic blood pressure, smoking and daily energy intake. Arterial stiffness associated with tea intake (b-coefficient = -0.371; $P = 0.03$) as well as dairy product consumption (b-coefficient = -0.943; $P = 0.02$). Increased red meat intake associated with TyG-index (b-coefficient = 1.348; $P = 0.01$). Dietary patterns including higher amounts of tea, alcohol, nuts, non-refined cereals and a high MedDietScore associated with lower MUAC and TSF values. Results remained consistent after further adjustment for the TyG-index.
Conclusions
Nutritional habits are associated with metabolic and vascular indices suggesting a relation with cardiovascular risk in menopause regardless of traditional cardiovascular-risk factors, total energy intake or physical activity.

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O08

Original Research, Oral presentation
Additive antitumor effect of metformin and simvastatin combination in glioblastoma: evidence for a potential drug repurposing

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Background
Glioblastomas (GBMs) remain the deadliest human brain tumors, with a poor prognosis despite years of research. Currently, standard therapeutic strategies to treat GBM are not efficient, and the overall survival is ~14 months. Thus, the identification of new therapeutic tools to battle GBMs is crucial. In this sense, many metabolic drugs (e.g., metformin (MF) and simvastatin (SVT)) have emerged as putative antitumor agents for certain endocrine-related cancers, demonstrating antitumor effects.
Objectives
We aimed to evaluate the putative in vivo association between MF and/or SVT treatment and key clinical parameters in GBM patients, and the direct effects of MF, SVT, and their combination, on key functional endpoints and associated signaling mechanisms in GBM.
Methods
An exploratory/observational retrospective patient cohort with GBM ($n = 61$) was analyzed. Human GBM cell lines and patient-derived GBM cells were used to measure a set of key functional parameters and signaling pathways in response to MF, SVT, and their combination.
Results
MF/SVT combination showed an association to longer overall survival in GBM patients. Moreover, MF and SVT exerted strong antitumor actions in terms of proliferation, migration, tumorsphere, VEGF secretion, and apoptosis in vitro. Remarkably, their combination further decreased these parameters. These combined actions were mediated through the modulation of key oncogenic signaling pathways (AKT/JAK-STAT/NFkB/TGFβ pathways). Interestingly, an enrichment analysis uncovered an activation of the TGFβ pathway together with the AKT inactivation after combination treatment, which might be strongly linked with induction of senescence-associated secretory phenotype and a senescence state transition.
Conclusion
Therefore, given the demonstrated clinical safety of MF and SVT, and their antitumor effects observed in GBM, our results suggest a potential therapeutic role for these drugs, especially their combination, in GBMs.

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O09

Original Research, ePoster
Characterization and oncogenic role of the somatostatin receptor splicing variant SST5TMD4 in human high-grade astrocytomas

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Background
Gliomas are the most common primary brain tumor, being astrocytomas a subset of malignant gliomas graded on a scale of I to IV. Grade-IV astrocytomas (glioblastoma multiforme; GBM) are the most malignant and aggressive type. Current standard treatments are ineffective, being their average postoperative survival of 12-16 months. Therefore, there is a clear need for the identification of novel therapeutic targets to treat this pathology. In this context, the truncated variant of the somatostatin receptor 5, sst5TMD4, is overexpressed and associated with increased aggressiveness in several endocrine-related tumors. However, the presence, functional role and molecular mechanisms of sst5TMD4 in astrocytomas have not been yet explored.
Objectives & Methods
To comprehensively analyse the expression of sst5TMD4 and its pathophysiological role in astrocytomas using human GBM samples and human GBM cell lines (U-87 MG and U-118 MG).
Results
sst5TMD4 variant was significantly overexpressed in astrocytomas ($n = 63$)

compared to healthy-control brain tissues ($n=15$). Remarkably, overexpression of sst5TMD4 increased, whereas its silencing decreased, the proliferation rate and migration capacity of GBM cells *in vitro*. Our data also indicated that the modulation of the expression of sst5TMD4 in GBM cells altered key signaling pathways associated with tumor aggressiveness and progression such as the AKT pathway. Moreover, the silencing of sst5TMD4 sensitized GBM cells to the treatment with somatostatin analog pasireotide.

Conclusion

Our results demonstrate that the sst5TMD4 splicing variant is overexpressed in astrocytomas and associated with enhanced malignancy, supporting its possible utility as a tool to develop new molecular biomarkers and drug therapies for GBMs.

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O10

Original Research, ePoster

Use of pre-lecture Concise Medical Information Cines (CoMICs) to enhance learning in medical school

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Objectives

Pre-clinical medical education is mainly delivered in didactic large-group lectures, where complex new terminology and concepts are introduced. Mounting evidence suggests that pre-class activities introducing new material can increase student performance. Concise Medical Information Cines (CoMICs) compresses information on various diseases into 5-minute videos. This study assessed the effectiveness of CoMICs as a pre-lecture resource to enhance learning and motivation to attend lectures.

Methods

Two CoMICs (Cushing's syndrome and adrenal insufficiency) in line with the on-going curriculum were created and reviewed by experts. All first year University of Birmingham medical students were invited to participate in the study. Students who opted in were provided access to the CoMICs a week prior to the lecture. Changes in self-perceived knowledge and reception of the CoMICs were assessed with pre- and post-lecture questionnaires. Differences between the two groups—those who watched the CoMICs before the lecture, and those who did not—were compared using the Wilcoxon Signed-rank test ($p<0.05$).

Results

In total, 88 students completed the questionnaires. A larger improvement in knowledge was seen in students who watched the pre-lecture videos on both topics ($p<0.0001$). 82.4% of students ($n=28/34$) enjoyed watching the CoMICs and stated that they will watch the CoMICs to prepare for exams.

Conclusions

CoMICs proved to be an effective pre-lecture resource for pre-clinical medical students further enhancing knowledge acquisition and interest in the subject, as compared to lectures alone.

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O11

Original Research, ePoster

Simulation via Instant Messaging – Birmingham Advance (SIMBA): First steps towards standardising online simulation-based learning in clinical endocrinology

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Background

The COVID-19 pandemic restricted face-to-face teaching leading to increased use of virtual learning platforms. Launched in 2019, Simulation via Instant Messaging – Birmingham Advance (SIMBA) delivers simulation-based learning to increase clinicians' confidence in managing various clinical scenarios.

Objective

To explore SIMBA's effectiveness to sustain medical education in endocrinology during the pandemic.

Methods

We included five sessions on different subspecialties in endocrinology (adrenal, thyroid, pituitary, diabetes, and metabolic bone) conducted from May 2020 to February 2021. We analysed participants' pre- and post-simulation surveys studying change in confidence on simulated case post-session and proportion change in core competencies recommended by the Accreditation Council for Graduate Medical Education (Patient Care, Knowledge, Communication Skills, Professionalism, Practice-Based Learning, Systems-Based Practice).

Results

239 participants were included in analysis. Participants' approach to simulated cases significantly improved following SIMBA: [overall ($n=239$) ($p<0.001$); adrenal ($n=33$) ($p<0.001$), thyroid ($n=37$) ($p<0.001$), pituitary 2.0 ($n=79$) ($p<0.001$), diabetes 2.0 ($n=46$) ($p<0.001$), metabolic bone ($n=44$) ($p<0.001$)]. SIMBA improved participants' clinical competencies in patient care [57.3% ($n=137/239$)], professionalism [33.9% ($n=81/239$)], patient management [86.2% ($n=206/239$)], systems-based practice [46.0% ($n=110/239$)], practice-based learning [71.5% ($n=171/239$)], and communication skills [23.0% ($n=55/239$)].

Conclusions

SIMBA effectively helped to maintain continuing medical education during the pandemic through improving clinicians' confidence in their approach to various endocrine conditions. Further studies are recommended to study the impact and change amongst participants from across countries to study the regional differences to help standardise and bring in uniformity in endocrine training.

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O12

Original Research, ePoster

Tier 3 weight management: patient comorbidities and clinical outcomes

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Objectives
The Tier 3 Weight Management (WM) service is a comprehensive pathway for people with a Body Mass Index (BMI) >40 or >35 with complications. This study aimed to describe the clinical characteristics and outcomes in patients referred to the WM service in Birmingham and Solihull (BSol).
Methods
This was a retrospective health service evaluation of adults consecutively referred to the BSol WM service from March 2017 to April 2018. Data was extracted from electronic health records of patients at baseline and at 12 months. Data was analysed using PrismV6 and presented as mean (SD) or median (IQR) depending on data distribution.
Results
421 referrals (71.7% female; mean age 42 years (12.72) were received. Referral weight was 128.55 kg (131-146.825); BMI 45.6 (41.75-51.1). Common co-morbidities identified were: mental health diagnosis 67.6%, hypertension 32%, obstructive sleep apnoea 32%, type 2 diabetes 29.3%, hyperlipidaemia 14.7% and hypothyroidism 9.74%. 14% females had polycystic ovary syndrome. 61.3% were taking antidepressants 320 patients attended the 1st appointment and 110 completed 12-months follow up implying a 65.6% dropout rate. 61 patients lost weight from baseline, 4 patients remained at the same weight while 45 patients gained weight. The median % weight loss was -4.08 (-6.43 to -2.32). 37.7% of patients lost >5% body weight and 13.1% lost >10% of body weight. 72 patients were referred for bariatric surgery after 12 months regardless of weight loss.
Conclusions
Most patients achieved significant weight loss but a notable proportion did not lose weight or had weight gain. The high drop-out is typical of WM services in the UK. 65% of patients who completed the service were referred for surgery. The remainder either achieved their weight loss goals, were not interested or had contraindications for bariatric surgery. The high proportion of mental health disorders and comorbidities in this group is important in designing future services.
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O13

Original Research, ePoster
Assessment of knowledge, attitudes and practices towards Endocrine Disrupting Chemicals (EDCs) among medical students of Punjab
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Background
An endocrine disruptor is an exogenous chemical or mixture of chemicals that interfere with any aspect of hormone action. It can interfere with the body's endocrine system and produce adverse cardiovascular, neurological, developmental, reproductive, and metabolic effects in humans. This study aims to evaluate the knowledge, attitude, and practices (KAP) of the medical students regarding the exposure, usage, and long-term harmful effects of Endocrine Disrupting Chemicals (EDCs) in everyday products.
Methods
A self-administered questionnaire was distributed among medical students of Punjab state between January and April 2021 via Google Forms after a thorough literature search and expert input from healthcare specialists. Responses collected were used for analysis anonymously to ascertain students' knowledge, exposure, and usage of EDCs using 1-5 Likert scale. Associations were examined using Chi-square and crosstabs analysis using IBM SPSS Statistics v26.0.
Results
Out of 403 respondents, the majority identified as male (56.3%) and fourth-year students (31.3%). The majority of students (84.9%) either felt extremely unknowledgeable or unknowledgeable about EDCs and were unaware (65.5%) of their concentration in everyday products and their effect on the synthesis, secretion, and elimination of natural hormones. The majority of them (75.2%) reported usage of plastic cans, plastic bottles, and/or cosmetics daily which contains Bisphenol A, Phthalates, and other EDCs of which they were unaware.
Conclusions
Our findings indicate that student KAP regarding EDCs and their impact on biological systems require improvement. Considering the nocuous health effects linked to EDCs, multifaceted and multidisciplinary approaches regarding minimising their usage are required. Further large-scale studies, educational curriculum changes, and awareness drives may help to increase literacy towards EDCs and steer future policy development.
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