The SARS-CoV-2 coronavirus is the cause of the COVID-19 pandemic. Entry of the virus into host cells, most destructively lung cells, requires two host cell surface proteins, ACE2 and TMPRSS2, downregulation of which is thus a potential therapeutic approach for COVID-19. Both of these cell surface proteins are steroid regulated: TMPRSS2 is a well-characterised androgen-regulated target in prostate cancer. Analysis of sequencing data shows co-expression of the androgen receptor (AR) and TMPRSS2 in key human lung cell types that are targeted by SARS- CoV-2. We show that treatment with antiandrogens such as enzalutamide (a well-tolerated drug widely used in advanced prostate cancer) significantly reduces TMPRSS2 levels in human lung cells and in vivo in mouse lung. We demonstrate that AR binding in the region of the TMPRSS2 gene differs between lung and prostate, identifying distinct regulatory regions. Together, the data and evidence presented supports clinical trials to assess the efficacy of antiandrogens as a treatment option for COVID-19.

Adipose Tissue, Appetite, and Obesity
THE RELATIONSHIP BETWEEN COVID-19 AND ENDOCRINOLOGY

Early Follow-up of Atypical Thyroiditis Induced by SARS-CoV-2

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Background: In Spring 2020 the severe acute respiratory syndrome coronavirus 2 pandemic disease (Covid-19) badly affected Northern Italy. We have described for the first time the occurrence of thyrotoxicosis due to atypical subacute thyroiditis in 15% of patients hospitalised for Covid-19 pneumonia, compared with only 1% among patients hospitalised in the same wards during Spring 2019, thus before the Covid-19 pandemic. The whole group of Covid-19 patients also had median serum TSH concentrations significantly lower compared with the control group. The atypical thyroiditis induced by Covid-19 is not associated with neck pain, affects more men than women and especially those severely ill, thus coexists with non-thyroidal illness syndrome. Subacute thyroiditis is classically followed by subsequent occurrence of permanent thyroid dysfunction and autoimmunity, thus we have started a systematic follow-up program of these patients.
Methods: Longitudinal follow-up study of survived Covid-19 patients without previous known history of thyroid disorders and/or medications, assessing serum thyroid function and autoantibodies, C reactive protein (CRP), full blood count (FBC) and thyroid ultrasound (US) every 3 months. Patients showing baseline (at hospitalisation for Covid-19) thyroid dysfunction and/or focal hypoechoic areas suggestive for subacute thyroiditis at US performed 3 months post-infection, also underwent thyroid ^{99m}Tc or I^{123}uptake.
Results: To date, 53 patients have been included in the follow-up study. At 3 months post-infection, all of them presented with increased median (IQR) serum TSH concentrations compared with baseline: 1.3 (0.9–2.0) mIU/L versus 0.9 (0.5–1.8) mIU/L (p=0.0001). Similarly, serum concentrations of free-thyroxine, free-triiodothyronine, CRP and FBC had normalised compared with baseline. All patients had negative autoantibodies to TSH receptor; autoantibodies to thyroglobulin and to thyroid peroxidase were positive in 6/53 (11%) and 5/53 (9%) of patients, respectively. The thyroid US showed the presence of focal hypoechoic areas of thyroiditis in 16/51 (32%) patients, with thyroid uptake normal in 6/16 (37%), focally reduced in 8/16 (50%) and diffusely reduced in 2/16 (12%).
Conclusions: At 3 months after Covid-19 disease all patients had a normalised thyroid function, however imaging findings suggestive for subacute thyroiditis were still present in about one third of cases. The thyroid dysfunction induced by Covid-19 seems not mediated by autoimmunity. It is important to continue to follow these patients since they might develop thyroid dysfunction during the following months.

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Obesity Is Associated With Intensive Care Use and Duration of ICU Stay but Not Mortality Among 3246 Patients Hospitalized With COVID-19

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Obesity is associated with increased severity of viral illnesses, but its impact on outcomes in severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is yet to be elucidated. We sought to determine the association of obesity and other clinical factors with outcomes among patients hospitalized for severe coronavirus disease (COVID-19). This study included patients hospitalized between March 1, 2020 and September 17, 2020 in a 5-hospital health care system in Northeast United States, who had a positive RT-PCR assay of nasopharyngeal swabs for SARS-CoV-2 performed during hospitalization. Body mass index (BMI) was calculated using admission weight and height, and the WHO classification was used to define obesity. Both bivariate and multivariate logistic regression analyses were performed to determine the association of obesity and other clinical parameters with mortality (defined as in-hospital death or transition to hospice care) and intensive care use (defined by transfer to intensive care unit [ICU]). Multivariate model was adjusted for demographics and 8 pertinent comorbidities. Among 3246 patients hospitalized with COVID-19, median age was 65 years (interquartile range, 51–78), 49.9% were female, 30.5% overweight, and 43.2% had obesity (20.8%,

12.1%, and 10.4% with class I, II, and III obesity, respectively). A total of 542 (16.7%) patients died or received hospice care, and 811 (25.0%) required ICU care. In unadjusted analyses, patients with obesity had lower mortality compared with normal weight adults (13.0% vs. 23.1%) but a higher risk of ICU care (26.5% vs. 22.5%) and longer duration of ICU stays (9.5±10.6 vs. 6.6±8.5 [days]; all p-values <0.05). Obesity was associated with a higher incidence of hypoxic respiratory failure requiring invasive (17.8% vs. 9.3%) and noninvasive (22.7% vs. 14.0%) ventilatory support. In multivariate analysis, older age, male sex, and diabetes were significantly associated with both mortality and ICU care. In contrast, obesity was not associated with a significantly higher mortality (adjusted odds ratio [OR] 1.14; 95% CI, 0.91–1.43) but was associated with a higher risk of ICU care (OR 1.27; 95% CI 1.07–1.51 for all obesity and OR 2.07; 95% CI 1.51–2.82 for class III obesity compared with normal weight). The association of underweight with mortality (OR 1.56; 95% CI 0.93 - 2.60) and ICU care (OR 1.20; 95% CI, 0.71–1.99) was not statistically significant. This retrospective study of hospitalized patients suggests that obesity is associated with intensive care use and longer duration of ICU stay but not with mortality due to COVID-19. These findings underscore the vulnerability of individuals with obesity during the current pandemic.

Adipose Tissue, Appetite, and Obesity

THE RELATIONSHIP BETWEEN COVID-19 AND ENDOCRINOLOGY

Risk of Complications in Children With Type 1 Diabetes and Covid-19

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Background: There is some data available in adults which suggests that Type 1 diabetes may be associated with higher risk with Covid-19 (1). Limited data has been available in pediatric Type 1 diabetes with Covid-19. **Methods:** We used TriNetX, with a large COVID-19 database, collecting real-time electronic medical records data. We compared children (0–18 years) who were diagnosed with Covid-19 with and without Type 1 diabetes. This database collected information from 54 health care organizations. **Results:** Mortality rate in children with Covid-19 and Type 1 diabetes was 0.618% (10/1618). Mortality rate in children with Covid-19 without Type 1 diabetes was 0.102% (257/251517). Relative risk of mortality for children with Covid-19 and Type 1 diabetes was 6.05 with a p value of < 0.0001. Endotracheal intubation rate in children with Covid-19 and Type 1 diabetes was 0.618% (10/1618). Endotracheal intubation rate in children with Covid-19 without Type 1 diabetes was 0.071% (178/251517). Relative risk of endotracheal intubation for children with Covid-19 and Type 1 diabetes was 8.73 with a p value of < 0.0001. Pneumonia rate in children with Covid-19 and Type 1 diabetes was 0.804% (13/1618). Pneumonia rate in children with Covid-19 without Type 1 diabetes was 0.562% (1414/251517). Relative risk of pneumonia for children with Covid-19 and Type 1 diabetes was 1.43 with a p value of < 0.1959. Septic shock rate in children with Covid-19 and Type 1 diabetes was 1.05% (17/1618). Septic shock rate in children with Covid-19 without Type 1 diabetes was 0.293% (737/251517). Relative risk of septic shock for children with Covid-19 and Type 1 diabetes was 3.59 with a p value of < 0.00001. Conclusion: Mortality rate, endotracheal and septic shock were increased in children with Type 1 diabetes and Covid-19 versus children with Covid-19 and no Type 1 diabetes. Further studies with larger sample size are needed to study complication rate of Covid-19 and Type 1 diabetes.
References 1) Associations of type 1 and type 2 diabetes with COVID-19-related mortality in England: a whole-population study. Lancet Diabetes Endocrinol 2020 Oct;8(10):813–822. doi: 10.1016/S2213-8587(20)30272-2. Epub 2020 Aug 13.

Adipose Tissue, Appetite, and Obesity

WHAT'S NEW IN WEIGHT MANAGEMENT THROUGH THE LIFESPAN?

Dextroamphetamine Treatment for Children With Hypothalamic Obesity

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Introduction: Hypothalamic obesity (HO) in children can be either genetic or acquired, as a result of a suprasellar tumor or its treatment. HO, resulting from hyperphagia and/or a decreased resting energy expenditure (REE), may have devastating consequences for the child and its family. Currently, no effective drug treatment is yet available for HO. Amphetamines – commonly used in children with attention-deficit/hyperactivity disorder – are known for their stimulant effect on REE and inhibitory effect on appetite. We here present our experiences of dextroamphetamine treatment in children and adolescents with acquired or genetic HO. **Methods:** A retrospective cohort evaluation was performed of patients (n = 18) treated with dextroamphetamine at 2 endocrine pediatric clinics. Off-label use of dextroamphetamine was initiated in patients with progressive therapy resistant acquired HO (n = 13) and in patients with genetic obesity (n = 5). Initial treatment dosing was once or twice daily 5mg. This dose was weekly increased with 5 mg/day depending on the patient' wellbeing and the presence of side effects, to a maximum of 0.5 mg/kg/day. Anthropometrics and REE at start and during follow-up, changes in (hyperphagic) behavior, and side effects were assessed.
Results: At start of treatment, mean age was 12.8 years ± 3.4 [range 7.1–17.9] and mean REE was 69.5%± 18.5 (n = 15). At follow-up, mean treatment duration was 18.3 months ± 14.7. Ten out of eighteen children (55.6%) showed clinically relevant weight loss. In 10/13 patients with acquired HO,