

Evaluating hormone-related targets & risks associated with COVID-19

The evidence for hormone involvement in COVID-19 infection and treatment will be evaluated and discussed by endocrine experts in a dedicated COVID-19 session at [e-ECE 2020](#). The European Society of Endocrinology's annual meeting is going online 5-9 September 2020 and the [e-ECE 2020 programme](#) will feature cutting-edge science and the latest in clinical practice and patient care. This includes a new, dedicated COVID-19 session, where experts in the field will present, summarise and examine evidence for the role of the endocrine system and hormones in COVID-19 infection risk, disease severity and potential treatment.

The global COVID-19 pandemic has massively affected how we all live and work and has become the major focus of medical research, as the scientific and medical communities strive to understand it better, develop effective treatments and create a vaccine. This has led to a huge volume of studies being pushed out to the public domain, including some that have not been subject the usual rigorous, scrutiny of peer review. This has resulted in conflicting messages in the media and has contributed to mistrust of experts.

Although initially thought to be a respiratory, influenza-like condition, several studies have now implicated that the severity of COVID-19 infection is increased in people with cardiovascular disease, diabetes and obesity. This raises the possibility that the consequences of viral infection are being affected by the endocrine system. Additionally, severe illness is more common in men, further suggesting that sex, possibly male and female sex hormones, are affecting coronavirus infection. More recently the glucocorticoid, dexamethasone, has shown promise as a treatment in severely ill patients with COVID-19. All of these findings indicate a key role for the endocrine system in mediating infection, disease severity and as a possible therapeutic target.

In the dedicated COVID-19 session at 16:45 CET on 8 September, three experts will review the evidence for the endocrine system's role in SARS-COV-2 infection, and discuss how to mitigate these risks, with a view to better managing future cases and saving more lives.

- Daniel Drucker will discuss, 'Endocrine targets related to COVID infection'
- Julia Prado will discuss, 'Managing the cytokine storm'
- Matteo Rottoli will discuss, 'How strong is obesity as a risk factor for COVID-19 patients?'

These sessions aim to critically evaluate the role of the endocrine system and endocrinology in the COVID-19 pandemic, with expert debate and hopes of identifying new protective strategies and treatment options, to reduce the disease severity and risk of death in the future.

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Abstracts

CS1.1

Endocrine Targets related to COVID19 Infection

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SARS-CoV-2 infection produces greater morbidity and mortality in people with cardiovascular disease, diabetes, and obesity, raising the possibility that the consequences of viral infection are modulated directly and indirectly by the endocrine system. Hospitalization and severity of illness is more common in males, further suggesting that sex, possibly male and female sex hormones, modifies the host response to coronavirus infection. SARS-CoV-2 cellular infection requires ACE2, as well as associated proteases, including TMPRSS2. These molecules are widely expressed in cardiometabolic organs, and the gastrointestinal tract, and to a lesser extent, in the endocrine and exocrine pancreas. Notably, TMPRSS2 is regulated by sex steroids, and clinical trials are examining whether disruption of steroid control of TMPRSS2 expression might be therapeutically useful in SARS-CoV-2 infection. Viral infection may also modify the host susceptibility to autoimmune disease, through dysregulation of humoral and cellular immunity and cytokine expression. Although SARS-CoV-2 infection has not been associated with widespread endocrine dysfunction beyond that commonly seen with critical illness, case reports of automimmune endocrine disease, including type 1 diabetes, have been described. The use of dexamethasone in severely ill individuals with SARS-CoV-2 prompts evaluation of potential endocrine consequences ensuing from sustained high dose glucocorticoid administration. Herein I will review the endocrine consequences of SARS-CoV-2 infection, highlight key knowns and unknowns, and discuss principles for linking coronavirus infection to disorders of the endocrine system.

CS1.3

How strong is obesity as a risk factor for COVID-19 patients?

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Objective

Specific comorbidities and old age create a greater vulnerability to severe Coronavirus Disease 19 (COVID-19). While obesity seems to aggravate the course of disease, the actual impact of the body mass index (BMI) and the cut-off which increases illness severity are still under investigation. The aim of the study was to analyze whether the BMI represented a risk factor for respiratory failure, admission to the intensive care unit (ICU) and death.

Research Design and Methods

A retrospective cohort study of 482 consecutive COVID-19 patients hospitalised between March 1 and April 20, 2020. Logistic regression analysis and Cox proportion Hazard models including demographic characteristics and comorbidities were carried out to predict the endpoints within 30 days from the onset of symptoms.

Results

Of the 482 patients included in the study, 202 (41.9%) had a BMI < 25 kg/m², 176 (36.5%) had a BMI between 25 and 29.9 kg/m², and 104 (21.6%) were obese (BMI ≥ 30 kg/m²). In the group with obesity, 20 patients (4.1%) had a BMI ≥ 35 kg/m². A total of 18 patients (3.7%) had a BMI < 20 kg/m². Hypertension and type 2 diabetes were reported in 76 (72.8%) and 27 (26%) patients with a BMI ≥ 30 kg/m², respectively. Among patients with obesity, 54 (51.9%) experienced respiratory failure, 38 (36.4%) were admitted to the ICU, 26 (25%) required mechanical ventilation, and 31 (29.8%) died within 30 days from the onset of symptoms. At logistic regression analysis, a BMI between 30 and 34.9 kg/m² significantly increased the risk of respiratory failure (OR: 2.32; 95% CI: 1.31-4.09, p=0.004), and admission to the ICU (OR: 4.96; 95% CI: 2.53-9.74, p<0.001). A significantly higher risk of death was observed in patients with a BMI ≥ 35 kg/m² (OR: 12.1; 95% CI: 3.25-45.1, p<0.001).

Conclusions

Obesity is a strong, independent risk factor for respiratory failure, admission to the ICU and death among COVID-19 patients. Whereas a BMI ≥ 30 kg/m² identifies a population of patients at high risk for severe illness, a BMI ≥ 35 kg/m² dramatically increases the risk of death.

Notes for Editors

1. The live [COVID-19 Session](#) was held at 16:45 – 18:15 CET, on 8 September 2020, online during e-ECE 2020.
2. e-ECE 2020 was held online on the 5-9 September. Catch up on [ESE On-Demand](#).
3. The [European Society of Endocrinology](#) was created to promote research, education and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators, and by any other appropriate means.