

Position paper: COVID-19 and endocrinology

Call to address the interactions between COVID-19 and hormones and the understudied endocrine and metabolic consequences of the virus in EU policy

COVID-19 has inflicted large-scale change and challenges across all sectors and states. For the healthcare sector, the crisis has led to disruptions in diagnoses, delays in surgeries, therapeutic changes, the transition to virtual consultations, and even avoidance of medical consultation in fear of transmission, while staff and resource shortages have been felt around the world. In parallel, we must not neglect the structural factors and underlying conditions that render populations vulnerable and exacerbate healthcare crises such as the COVID-19 pandemic. We must address these factors to help with the medium and longer-term management of the pandemic, and to ward off future ones.

The links between endocrine and metabolic conditions and the different stages of COVID-19

Endocrine-related conditions impact COVID-19 outcomes. The hormone system is the key regulator of maintenance of body weight, energy expenditure and energy (food) intake. Emerging research¹ based on rapid expert consensus shows the relationship between COVID-19 and several endocrine and metabolic diseases.

When it comes to **preventing** the severe outcomes of COVID-19, there is evidence that people suffering from hormone conditions, such as diabetes, obesity, autoimmune thyroid disease, adrenal insufficiency and Cushing's syndrome, face an increased risk of and/or from infection. Vitamin D² deficiency renders populations more vulnerable to infection and increases potential lung injuries.³ In addition, recent studies⁴ show that "certain underlying conditions associated with exposures to Endocrine Disrupting Chemicals (EDCs) are exacerbating the effects of COVID-19 in vulnerable populations".

Furthermore, **treatment** of COVID-19 is considerably more complicated for patients with underlying endocrine-related diseases. Obesity, diabetes, and other chronic diseases mean COVID-19 patients are more likely to suffer with severe symptoms, enter intensive care units, as well as have an increased risk of death.

Long-term quality of life following COVID-19 can also be impacted. Endocrine systems could suffer in the long term from the impact of COVID-19, because the hormone system is the key regulator of maintenance of body weight, energy expenditure and energy (food) intake. COVID-19 is associated

¹ <https://eje.bioscientifica.com/page/covid19-collection>

² a hormone ingested and/or produced after sun-exposure that helps to control the concentration of calcium in the blood and is vital for the development of strong bones. It also plays an important part in protecting the immune system.

³ Lecture given by Dr. Anna Formenti in the context of ESE Talks, 28/05/2020

⁴ Endocrine Disrupting Chemicals and COVID-19 www.healthandenvironment.org/webinars

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with anorexia, dysgeusia, dysfunction of gastrointestinal absorption and severe weight loss, mostly from muscle mass. to transmission fears. Long-term quality of life is a particularly worrying concern for the millions of patients in Europe suffering from thyroid-related disorders⁵, as well as those suffering from endocrine cancers. The current COVID-19 pandemic has transformed every aspect of endocrine/neuroendocrine cancer care, for which diagnosis and clinical management are challenging. Their unique needs that require a multidisciplinary approach, while each discipline is uniquely affected by the COVID-19 pandemic.

Endocrinology must be at the heart of EU policy

EU4Health is a very promising umbrella strategy for the next years. As this paper has outlined, this strategy needs a strong endocrine and metabolic element to achieve its objectives. ESE calls on the European institutions and EU Member States undertake the below actions without delay, with the aim to improve treatment and long-term health outcomes after the crisis is over by using the valuable experience gained during these challenging times:

- We call for **an urgent increase in research funding for the relationship between COVID-19 and hormones and metabolic factors** and the long-term health consequences of COVID-19 on endocrine and metabolic diseases,
- There also needs to be a coordinated effort for **global surveillance of cases and outcomes monitoring**,
- We also call for the development of new and effective models of **patient management**,
- Finally, **increased collaboration** is required between countries, policy makers and other stakeholder groups such as patient groups, other societies and pharmaceutical companies with endocrine/metabolic portfolios and digital solutions. In the presence of rapidly changing data available on the effect of COVID-19, sharing collective experiences from multiple countries at different stages of the COVID-19 pandemic seems essential.

About ESE

The European Society of Endocrinology is at the centre of Europe's endocrine community. It is our vision to shape the future of endocrinology to improve science, knowledge and health. It is our mission to advance endocrinology. We unite, support and represent our specialty, promoting collaboration and best practice, and enable our community to develop and share the best knowledge in endocrine science and medicine.

⁵ ENDOCRINOLOGY IN THE TIME OF COVID-19: Management of hyperthyroidism and hypothyroidism.

Boelaert K, Visser WE, Taylor PN, Moran C, Léger J, Persani L. Eur J Endocrinol. 2020 Jul;183(1):G33-G39. doi: 10.1530/EJE-20-0445. PMID: 32438340

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The ESE policy and advocacy task force supports with expert advice towards different areas where hormones and metabolism play a role – this includes, apart from addressing the impact of COVID-19, the prevention of prevalent diseases like obesity and diabetes, addressing the health inequalities in the care of rare diseases, developing better approaches towards cancer care and addressing the ubiquitous presence of endocrine disrupting chemicals and their consequences.

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ANNEX: Current research and gaps + available resources

Research is still in its early stages and there are many gaps. Of notable importance are the interactions between Covid-19 and diabetes/obesity because of their high prevalence in and cost to society. Patient involvement to address all gaps is crucial. Some important research questions include:

Metabolic disease	What is needed to better 'protect' obese people from the impact of COVID-19? How does stress affect patients with diabetes and obesity?
	What longer term metabolic consequences can we expect from COVID-19?
	Are there any lung alterations produced by metabolic diseases that may impact COVID-19 outcomes? ⁶
	What is leading to the potentially higher rates of autoimmune thyroid diseases emerging due to Covid-19, and how can treatment be optimised? ⁷
	To what extent are patients using glucocorticoids impacted by COVID-19? ⁸
Vitamin D	What are the links between Vitamin D deficiency and COVID-19 morbidity and mortality rates?
Pharmacological research	What are the consequences of the use of certain pharmaceuticals – not just on COVID-19 but on the endocrine system?
Cancer	
Rare diseases	How can we address the needs for rare disease populations, building on the ESE and ENDO-ERN launch initiative to collect data on patients with rare endocrine conditions and COVID-19, including in specific patients with adrenal insufficiency and patients with Cushing's syndrome?
Endocrine Disrupting Chemicals	What are the interlinkages between EDCs and COVID-19 or other diseases?
Long-term effects on hormones	What are the long-term consequences of having had COVID-19 on hormones and what would be the best treatment(s)?

⁶ [The Diabetic Lung: An easy target for SARS-CoV-2?](#) Caruso I, Giorgino F. Diabetes Metab Res Rev. 2020 May 19:e3346. doi:

⁷ <https://www.thyroid.org/covid-19/coronavirus-frequently-asked-questions/>

⁸ Meijer OC, Pereira AM. Three Percent Annually on Systemic Glucocorticoids: Facts, Worries and Perspectives. Eur J of Endocrinology, December 2019

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Available resources:

ESE has been engaged in developing resources to support clinicians throughout the COVID-19 period:

- ✓ 'COVID-19 and endocrine diseases – a statement from the European Society of Endocrinology' (23 March 2020).
 - ✓ Including the ESE decalogue for endocrinologists in the COVID-19 pandemic
 - ✓ COVID 19 statement from the ESE President
- ✓ ESE webinar series ESE Talks: Endocrine Conditions in the COVID-19 Era (7 May 2020).
- ✓ *European Journal of Endocrinology* (EJE) free review series: 'Endocrinology in the time of COVID-19' (21 April 2020). (already included above)
- ✓ ESE and ENDO-ERN launch initiative to collect data on patients with rare endocrine conditions and COVID-19 (24 April 2020).
- ✓ ESE RD committee and EndoERN project on Covid 19

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