

## PRESS RELEASE

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*Press release – European Congress of Endocrinology 2022 Abstract RC11.1: Impact of COVID-19 disease on thyroid function: longitudinal study.*

### **Effects of COVID-19 contamination on the thyroid gland are still present after one year, study finds**

Severe COVID-19 disease affects thyroid function through a variety of mechanisms according to a new study from **Dr. Ilaria Muller and colleagues from the University of Milan, Italy**. The study followed patients with thyroid dysfunction correlated to COVID-19 disease for one year, to better characterise such thyroid involvement and to follow its evolution over time. During moderate-to-severe COVID-19 disease the occurrence of thyroiditis (inflammation of the thyroid gland) plays an important role in thyroid dysfunction, in addition to other well-known mechanisms mainly acting on the hypothalamus-pituitary-thyroid axis. The hormone imbalance is usually mild but increases in severe cases of COVID-19. Their study will be presented during the 24th [European Congress of Endocrinology](#) on 23 May 2022 in Milan, Italy.

The thyroid function is crucial to the human body's metabolism, growth, and development. By continuously releasing a stable amount of thyroid hormones into the bloodstream, it aids in the regulation of numerous body functions. The thyroid gland generates extra hormones when the body needs more energy in particular situations, such as when it is growing, cold, or pregnant.

The study looked at more than 100 patients admitted to hospital with severe COVID-19, analysing their thyroid stimulating hormone (TSH) and other indicators. Thyroiditis occurred frequently in the COVID-19 patient population and the thyroid function, as well as inflammatory indicators, returned to normal in nearly all instances shortly after the end of their COVID-19 illness. However, after 12 months thyroiditis regions remained visible at thyroid ultrasound in half of the individuals, even if reduced in size. The thyroid uptake of technetium or iodine, an indicator of thyroid function, was still reduced in four out of six individuals at nine months, although it had mostly recovered after 12 months. The long-term clinical consequences, if any, are unknown.

#### European Society of Endocrinology

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"There is a clear link between thyroid dysfunction and COVID-19 disease", said Dr. Muller. "Knowing that thyroid hormones correlate with the disease severity is important, and the fact that the thyroid gland seems directly involved in SARS-CoV-2 (COVID-19) viral infection needs to be taken into account."

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### Notes for Editors

1. The presentation "**Impact of COVID-19 disease on thyroid function: longitudinal study.**" will be presented on Saturday 21 May at 12:00 CEST.
2. ECE 2022 will be held in Milan on the 21-24 May 2022. You can access more information about the congress [here](#).
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.

### About the European Society of Endocrinology

The European Society of Endocrinology (ESE) provides a platform to develop and share leading research and best knowledge in endocrine science and medicine. By uniting and representing every part of the endocrine community, we are best placed to improve the lives of patients. Through the 54 National Societies involved with the ESE Council of Affiliated Societies (ECAS) ESE represents a community of over 20,000 European endocrinologists. We inform policy makers on health decisions at the highest level through advocacy efforts across Europe.

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## **Abstract**

### **RC11.1**

#### **Impact of COVID-19 disease on thyroid function: longitudinal study.**

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**BACKGROUND:** The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic disease (COVID-19) affects thyroid function with different mechanisms: non-thyroidal illness syndrome (NTIS), direct infection of thyroid gland and cytokine storm. We provided the first description of painless atypical thyroiditis coexisting with NTIS in patients hospitalised for moderate-to-severe COVID-19 disease. We aimed to: 1) correlate thyroid dysfunction with COVID-19 disease severity; 2) follow the evolution of thyroid function over time.

**METHODS:** Baseline (at hospital admittance) and longitudinal study of patients hospitalised for moderate-to-severe COVID-19 disease, without known history of thyroid dysfunction, assessing serum thyroid function and autoantibodies, inflammatory markers and thyroid ultrasound scan (US). Patients showing at US focal hypoechoic areas suggestive for thyroiditis (thyroiditis-areas) also underwent thyroid <sup>99m</sup>Tc or I<sup>123</sup> uptake scan.

**RESULTS:** 183 COVID-19 patients were studied baseline, of whom 63 (34%) were already on steroid treatment before hospital admission, thus were not considered for TSH analysis. Decreased serum TSH positively correlated with albumin (p=0.02) and lymphocyte count (p<0.01) but not with C-reactive-protein (p=0.12) and interleukin-6 (p=0.10); TSH also progressively and inversely correlated to the need of oxygen support (p=0.02). Serum FT3 correlated positively with albumin (P<0.01) and inversely with D-dimer (p=0.02). Baseline thyroid US scan showed thyroiditis-areas in 18/65 (28%) patients, associated with reduced thyroid uptake at <sup>99m</sup>Tc/I<sup>123</sup> scintigraphy in 14/17 (82%) cases. Thyroiditis-areas were more frequent among patients with baseline low TSH (6/10, 60%) compared with those with normal TSH (10/40, 25%, p=0.034). The patients with thyroiditis-areas also had higher baseline FT4 (p=0.018) and IL-6 (p=0.016) compared with those with

normal thyroid US. Follow-up analysis was conducted in 75/183 (41%) patients; thyroid function and inflammatory markers normalized at all time-points in nearly all cases and no increase of thyroid autoantibodies positivity was observed. The thyroiditis-areas, even if often reduced in size, were still present after 6 and 12 months in 13/15 (87%) and 6/12 (50%) patients, respectively. After 9 months the thyroid uptake at  $^{99m}\text{Tc}/^{123}\text{I}$  scintigraphy was still reduced in 4/6 (67%) patients, even if partially recovered (mean +28%) compared with baseline.

**CONCLUSIONS:** Thyroid dysfunction during moderate-to-severe COVID-19 disease is mild and transient, and thyroid hormones correlate with disease severity. Thyroiditis-areas at US occur frequently and may persist after one year, even if reduced in size; long-term consequences are unknown. The association of thyroiditis-areas with low TSH and high FT4 and IL-6 serum concentrations support the hypothesis of direct thyroid gland involvement in SARS-CoV-2 infection.