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LETTER

SARS-COV-2 as a trigger for autoimmune disease: report of two cases of Graves' disease after COVID-19

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To the Editor

Since the outbreak of the SARS-CoV-2 pandemic, there have been many reports of autoimmune diseases triggered by or related to COVID-19 such as Guillain–Barre's syndrome, autoimmune haemolytic anaemia, autoimmune thrombotic thrombocytopenic purpura or autoimmune thrombocytopenic purpura. Regarding thyroid disease, there have been three case reports of subacute thyroiditis [1–3] but, as far as we know, there have been no reports about autoimmune hyperthyroidism.

We hereby describe two cases of autoimmune hyperthyroidism (Graves' disease) occurring after SARS-CoV-2 infection.

A 60-year-old woman with a previous diagnosis of Graves' disease at the age of 23 years, treated with thiamazole and who had been in remission since the age of 25 years with a normal thyroid function on the last check-up (September 2019). She presented to the primary care center with dyspnoea and chest pain in April 16th, 2020. A naso-pharyngeal swab test for SARS-CoV-2 was negative but lung ultrasound showed an interstitial pattern compatible with COVID-19 pneumonia and both IgM and IgG against SARS-CoV-2 were positive 4 days later. After clinical improvement, she presented to the emergency room on May 25th, 2020, with palpitations, nervousness and fatigue. Thyroid function was assessed, showing suppressed TSH (< 0.01 mIU/mL, normal range 0.3–5), normal free thyroxine (FT4 16 pmol/L, normal range 9–19) and elevated free triiodothyronine (FT3 7.93 pmol/L, normal range 2.63–5.7). Upon physical examination, no goiter was found and she referred no cervical pain. TSH receptor antibodies were positive (2.13 IU/L, normal range < 1.75) and thyroperoxidase and thyroglobulin antibodies were also positive (1343 IU/mL, normal range < 100; 199 IU/mL, normal range < 138; respectively). Thyroid iodine uptake was increased to 30% and 45.7% at 2 and 24 h after administration of 100 µCi of iodine (I131).

A 53-year-old woman experienced dyspnoea and fever starting on March 17th, 2020. A naso-pharyngeal swab test for SARS-CoV-2 was negative but chest X-ray showed bilateral interstitial pneumonia compatible with COVID-19. She did not require hospitalisation and was treated symptomatically. No iodine-containing drugs were given. Infection by SARS-CoV-2 was later confirmed by positive IgG on April 20th, 2020. Due to persisting asthenia and onset of tremor and palpitations, thyroid function was assessed on May 21st, 2020, showing suppressed serum TSH (< 0.01 mIU/mL) with increased serum-free thyroxine (FT4 36.5 pmol/L). Physical examination revealed a non-tender goiter. TSH receptor antibodies were positive (6.07 IU/L), as well as thyroperoxidase and thyroglobulin antibodies (3239 IU/mL and 1617 IU/mL, respectively). Iodine-uptake was increased to 61 and 62% at 2 and 24 h respectively.

Therapy with thiamazole and propranolol was started to both patients with improvement of symptoms and thyroid function.

Clinical presentation, increased thyroid uptake and positive TSH receptor antibodies are compatible with a diagnosis of Graves' disease (autoimmune hyperthyroidism). Both cases of hyperthyroidism were diagnosed 1 and 2 months after the clinical onset of COVID-19.

In conclusion, we report two cases of Graves' disease after COVID-19, one with a previous history of Graves' disease in remission for more than 30 years, and another with no previous known thyroid disease. Of course, with Graves' disease being the most frequent cause of hyperthyroidism, especially in middle-aged women, the association might be

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casual. However, the increasing number of publications on autoimmune diseases related to COVID-19 suggests that SARS-CoV-2 could act as a trigger of latent or new-onset autoimmunity. Physicians and especially endocrinologists should be aware of possible connections between SARS-CoV-2 and thyroid dysfunction, both subacute thyroiditis [1–3] and Graves' disease, which should be investigated by future prospective studies.

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Compliance with ethical standards

Conflict of interest All authors declare that they have no conflicts of interest.

Ethical approval All procedures performed during this retrospective study were in accordance with the ethical standards of institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The ethical committee approval is not required for case reports.

Informed consent Signed consent was obtained from both patients. Data were anonymized.

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