

CASE REPORT

A CASE OF POST COVID-19 SUBACUTE THYROIDITIS

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Abstract:

Subacute thyroiditis is an immune reaction of the thyroid gland that often follows an upper respiratory tract infection. It is an uncommon but usually a self-limiting inflammatory condition. The clinical presentation varies from person to person, but usually includes neck pain or discomfort and a painful diffuse goiter. There is at times a transient episode of hyperthyroidism followed by euthyroidism and sometimes hypothyroidism. We describe the case of a previously healthy 34-year-old female presenting with symptoms consistent with subacute thyroiditis. The patient had recently recovered from a mild episode of COVID-19 infection. Labs and imaging were consistent with the clinical diagnosis of subacute thyroiditis. The patient was provided symptomatic treatment with prednisone and propranolol and had an uneventful recovery.

Key words: Covid-19, Subacute thyroiditis, Thyroid tests, Propranolol, Prednisolone

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Introduction:

In December 2019, the WHO was notified about cases of pneumonia of unknown etiology originating in Wuhan, Hubei province, China.¹ The novel virus, named severe-acute-respiratory-syndrome-coronavirus-2 (SARS-CoV-2), was isolated on January 7, 2020.¹ The acute respiratory disease, renamed Coronavirus disease 2019 (COVID-19), was declared a pandemic by the WHO on March 11, 2020.²

The initial reported symptoms of COVID-19 in China were primarily respiratory. COVID-19 infection has a varied presentation from mild upper respiratory involvement to a more severe presentation, including acute respiratory distress syndrome, septic shock, and kidney failure. As of now, there have been a few cases that described the association between COVID-19 and thyroid gland involvement. We report a patient diagnosed with subacute thyroiditis after recovering from COVID-19 disease. The objective of the article is to create awareness regarding this novel entity and the association with thyroid dysfunction.

Case Presentation:

A previously healthy 34 years old female presented to the endocrine department of Dhaka Medical College Hospital with fever and odynophagia. She was positive for covid-19 infection confirmed by rt-PCR five weeks ago. At that time, she presented with 3 days history of fever and cough which was managed with a 10 - days course of antibiotics and antihistamine. She recovered without any complications. The patient was in her usual state of health one month before the current presentation when she experienced fever which was low grade, intermittent in nature. Few days later, she became restless and complaint of palpitation, sweating and loose stool. rt-PCR for covid-19 was repeated and came out negative. She was prescribed another course of antibiotics for 7 days and felt better. One week later, she complained of sore throat and pain with swallowing solid food, which gradually progressed to difficulty in swallowing for liquids and solid foods. Fever was intermittent in nature with a maximum temperature of 102°F. She

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only took paracetamol with minimal relief of symptoms. Later, she presented with palpitation and exertional shortness of breath, limiting her exercise and unintentional weight loss of 10 pounds. She denied any history of smoking, alcohol, and illicit drug abuse. The family history was negative for any malignancy or thyroid disorder.

On examination, the patient was febrile, temperature was 101°F with tachycardia at 130 beats/min, respiratory rate was 22/min, oxygen saturation was 98% at room air, and her blood pressure was 120/80 mm Hg. Her physical exam was notable for anterior neck tenderness and fine bilateral hand tremors. Her electrocardiography revealed sinus tachycardia with no evidence of atrial fibrillation. Investigations showed elevated erythrocyte sedimentation rate at 84 mm/hour which became 120 mm/hour 2 weeks later, C-reactive protein at 44 mg/l, free triiodothyronine (T3) levels were at 6.9 pmol/L (reference 2.8-9.5) but free

thyroxine (T4) level was elevated at 26.11 pmol/L (reference 9.5-25.5). Thyroid-stimulating hormone (TSH) was low at 0.04 mIU/L(0.3-5 mIU/L). Thyroid peroxidase antibody was negative (Table-I). Ultrasound of the neck showed an enlarged thyroid gland with heterogenous echotexture (Figure-1). Radio-iodine uptake was performed and showed low uptake 2% (reference 10-30%) in 24 hours. Diagnosis of post covid-19 subacute thyroiditis was made, and patient was discharged with oral methylprednisone (12 mg) and propranolol (20 mg) daily. The patient was followed at three days, and she remained symptomatic with exertional tachycardia and shortness of breath.

The patient was followed at weekly intervals, with continued improvement. Prednisolone was gradually tapered off over six weeks, and propranolol was discontinued. The patient remained asymptomatic at ten weeks follow up, and the thyroid function tests returned to normal.

Table I
TFTs at multiple time-points during the patient's illness

Laboratory Test	Normal Range	15/10/2021	24/10/2021	04/11/2021
TSH	0.3-5 mIU/L	0.12	0.04	0.33
ft4	21.3	28.2	26.11	1.24
ft3	6.7	7.1	6.9	2.53
ESR	0-10 mm / hr	120	84	51
Thyroid peroxidase antibody	< 60.00 U/mL	(Negative)		(Negative)
Radioiodine uptake test				2 hours- 8%(4-10%) 24 hours- 2%(10-30%)

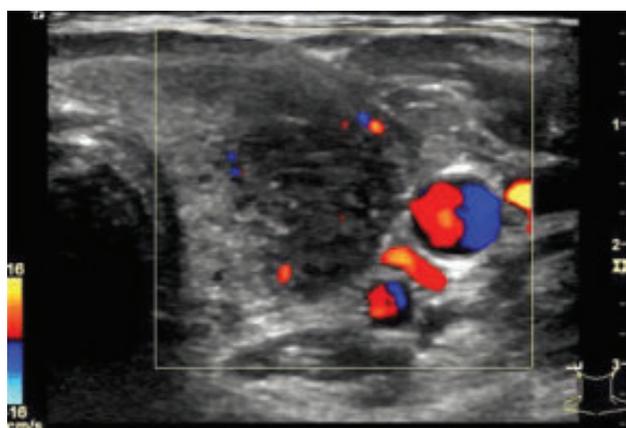


Fig.-1: *Ultrasound of the neck showed an enlarged thyroid gland with heterogenous echotexture. Both lobes had hypoechoic areas with ill-defined margins corresponding to the palpable hard regions. Colour flow Doppler showed reduced blood flow in both lobes. There were no definite nodules seen in the thyroid gland. A few cervical lymph nodes with normal morphology were seen.*

Discussions:

Subacute thyroiditis commonly affects females compared to males with a ratio of 4:1 and occurs usually at middle ages.^{3,4} The condition is recognized as self-limited inflammatory disorder of the thyroid gland that can manifest both during the active viral infection as well as within two to eight weeks of viral infection.⁵ The most commonly implicated viruses are coxsackievirus, mumps, measles, rubella, adenovirus, influenza, parvovirus B19.⁶ The novel coronavirus has lately been recognized with growing awareness of the complications.^{7,8} Thyrotoxicosis and covid-19 infection share symptoms including sore throat, fatigue, chills, anorexia, fever and weight loss. This common symptomatology can be easily confused for covid-19 symptoms.⁹ Therefore, a strong clinical suspicion is required to rule out both diseases simultaneously. In a usual clinical course, half of the patients experience transient symptoms of thyrotoxicosis followed by euthyroidism,

hypothyroidism, and normal thyroid function within three months.^{3,8}

In our literature search, in regards to the mechanism, we found that the inflammatory reaction to the virus activates the macrophages and cytotoxic T-cells, which then attack the viral damaged host tissues, followed by thyroid follicular cells, as they share the structural similarity.³ Muller et al. suggest that the affinity of SARS-CoV-2 to the thyroid gland is via the angiotensin-converting enzyme 2 (ACE2) receptors. This receptor is recognized as necessary for SARS-CoV-2 to invade human cells and is more prevalent in thyroid cells than lung cells.^{10,11} Hence, clinicians should be aware of the possibility of subacute thyroiditis in patients experiencing SARS-CoV-2 infection. Management of subacute thyroiditis is usually supportive and includes anti-inflammatory therapy with the nonsteroidal anti-inflammatory drug (NSAID) or prednisone. Symptomatic patients experiencing symptoms of hyperthyroidism such as palpitations, anxiety, or tremors may benefit from treatment with a beta-blocker such as propranolol/atenolol.¹³

Conclusion:

With the increasing prevalence of COVID-19, we are likely to see more cases of subacute thyroiditis in individuals who have, or have had, COVID-19. It is therefore important to consider this complication when a person who has previously been diagnosed with COVID-19 develops signs and symptoms of hyperthyroidism as well as fever and/or neck/throat pain. We as physicians should keep the possibility of subacute thyroiditis in mind when assessing patients and not confuse thyroiditis symptoms for pharyngitis or lethargy that are usually present during covid-19 infection, more importantly as most patients with covid-19 are asymptomatic. We recommend thyroid function tests in patients with new symptoms following initial improvement after covid-19.

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