

Covid-induced thyroiditis

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Abstract

Thyroiditis is one of the manifestations of novel Covid-19 virus. Thyroid function test (TFTs) shows typical features of hyperthyroidism. Inflammatory markers and thyroid scan give clue to the diagnosis. This report is about a 39-year-old female who presented with signs and symptoms of thyrotoxicosis along with pain in the neck, odynophagia, and intermittent fever after recovering from Covid-19 a few weeks back. She had no significant history of past medical or endocrine disease. TFTs revealed high T3 and T4 and low TSH. Thyroid scan revealed decrease uptake and ESR was 115. She was started on NSAID, steroids, and beta blocker. Four weeks later, she reverted with the resolution of symptoms and normal TFTs.

Keywords: Covid-19, thyroiditis.

DOI: 10.47391/JPMA.4974

Submission completion date: 07-10-2021

Acceptance date: 04-06-2022

Introduction

By the end of 2019, cases of acute severe respiratory distress secondary to unknown aetiology leading to death were reported from Wuhan, China. A month later SARS-COV-2 was isolated from the same cases in Hubei, China and ultimately Covid-19 pandemic was declared.^{1,2}

As the pandemic held its ground a variety of manifestations were reported across the globe ranging from mild respiratory tract infection in majority of the cases to septic shock and multi-organ failure in minority. Till date, very few cases related to the effect of Covid-19 on thyroid gland have been described. Here, we report about a female patient who was diagnosed to have post Covid subacute thyroiditis, with the aim to create awareness regarding the possible association between Covid-19 infection and thyroid dysfunction.

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Case Presentation

A 39-year-old female with no previous comorbidity presented to the OPD at Hayatabad Medical Complex, Peshawar, in July 2020, with the complaints of pain and swelling in the front of the neck along with odynophagia, and mild intermittent fever for two weeks. A month earlier, she was diagnosed with Covid-19 on the basis of PCR, that was done following symptoms of fever, generalised body aches and dry cough for several days. She had a positive contact history with Covid positive patients in the family. She was managed conservatively with five-day course of Azithromycin and symptomatic treatment along with isolation at home. She reported complete symptomatic recovery within a week and was PCR negative after two weeks.

Two weeks after recovery, she began to notice gradual worsening of neck pain anteriorly with radiation to the jaw and associated odynophagia along with mild swelling. This was also associated with mild, intermittent fever with rigors and chills that would be relieved with Acetaminophen. On examination, the patient was febrile with temperature of 100°F, tachycardic with pulse rate of 110, respiratory rate was 22 and saturation of 96%. She had fine bilateral tremors in hands along with hyperreflexia. Thyroid examination showed mild symmetrical swelling that was very tender to touch.

Baseline investigations showed raised inflammatory markers with ESR of 115mm/ hr, CRP 48mg/l, and S. FERRITIN of 740ng/ml. TFTs were suggestive of thyrotoxicosis with an undetectable TSH <0.04μIU/ml, T4 2.66ng/dl, and T3 1.8 ng/ml. Anti TPO and Anti-Tg were negative. CBC and other metabolic profile were normal. Thyroid scan showed generalised decrease uptake. On the basis of these investigations, she was diagnosed to have subacute thyroiditis and was started on NSAIDS along with B. Blocker (Inderal) and was asked to come for regular follow-up, i.e. weekly for initial two weeks and then after two weeks.

On outpatient follow-up, she reported symptoms resolution at one week and was completely asymptomatic after two weeks of treatment. TFTs done after two weeks showed improvement, and after one month they returned to normal baseline. Treatment was continued for four weeks with gradual tapering of

Table: Biochemical profile of the patient at diagnosis and follow up.

Measure	Pre-treatment	2 Weeks Post-Treatment	4 Weeks Post
TSH (0.27 - 2.4 μ IU/ml)	<0.04	0.16	2.46
Free T4 (0.89 - 1.76ng/dl)	2.66	1.96	1.4
Free T3 (0.6 - 1.6ng/ml)	1.8	1.5	1.2
ESR (01 - 15 mm/hr)	115	60	08
CRP (0.3 - 1.0mg/dl)	48	10	0.6
TLC(4000-11000/mm3)	10,600	-	5920
HB (12 - 16 g/dl)	11.4	-	13.3
PLATELETS (150,000-450,000/mm3)	289,000	-	175,000
ANTI-TPO (<5.61IU/ml)	<1	-	-
ANTI-TG (<4.11IU/ml)	1.24	-	-

TSH (Thyroid Stimulating Hormone), ESR (Erythrocyte Sedimentation Rate), CRP (C-Reactive Protein), TLC (Total Leucocyte Count), Hb (Haemoglobin), Anti-TPO (Anti Thyroid Peroxidase Antibodies), Anti-TG (Anti Thyroglobulin).

medication after two weeks and was stopped at four weeks.

Informed consent was taken from the patient for publishing her case report.

Discussion

Subacute thyroiditis (SAT) aka de Quervain's is characterised by self-limiting inflammation of the thyroid gland, caused or followed by viral illnesses like influenza, measles, adenovirus, mumps, Coxsackie Virus, and HIV.³ Recently, association between novel Corona virus and subacute thyroiditis has been recognised with growing awareness.^{4,5} Clinical features of SAT include pain and tenderness over the thyroid gland accompanied by fever and malaise. Three distinct phases of the disease are seen during its self-limiting course, thyrotoxic, hypothyroid, and recovery phase usually over the span of weeks to months.⁶

SAT is mainly diagnosed on the basis of clinical judgement supported by lab investigations and imaging. Laboratory findings include high ESR, low TSH, high T3 and T4, with absent or low titer of circulating antibody, i.e. Anti TPO and Anti Tg⁶ and Thyroid scan will show low uptake. Non-steroidal anti-inflammatory agents (NSAIDs) are used as first line of treatment while steroids are reserved for severe or resistant cases.⁶ Patients who experience severe sympathetic manifestations may be given beta blockers.

Multiple studies are available now to support association between SAT and Covid-19.^{4,5} Brocatelle et al reported thyroiditis in an 18-year-old young female two weeks post Covid-19 infection whose symptoms resolved over seven days and thyroid functions returned to normal in 40 days.⁴

It is important to note that subacute thyroiditis and Covid-19 share some of the symptoms such as fever, sore throat, and weight loss, etc., which might lead to confusion. In order to distinguish, a high index of clinical suspicion is required.

The mechanism by which this virus affects the thyroid gland is not known. Chong et al revealed that the virus causes inflammation of the tissue which leads to infiltration of inflammatory cells like macrophages and T cells leading to the damage of the host tissue and follicular cells in the thyroid gland which have similarities in their structure.⁷ Multiple studies have noted that SARS COV-2 stimulate inflammatory response in affected host which might lead to cell death by apoptosis via various viral proteins.^{8,9} In SARS COV-2 patients, inflammation of affected tissue is the main culprit as an inflammatory infiltrate has been noted in many tissues including thyroid. With growing knowledge about the disease, it is now known that the presence of ACE-2 receptors on human cells is required for invading and expression of SARS COV-2 virus. These receptors are found in abundance in the lungs and thyroid gland as suggested by Muller et al.¹⁰

Clinical features and laboratory investigations of our patient were suggestive of thyrotoxicosis, while imaging studies were suggestive of subacute thyroiditis which was later confirmed from the different phases and TFTs returning to normal over the time. Covid-19 diagnosis was made on the basis of PCR prior to the onset of thyrotoxic symptoms. Other differentials were ruled out. The rapid resolution of symptoms after the introduction of anti-inflammatory agents further reinforced our suspicion. With growing knowledge about the disease and its late manifestations of Covid-19, this case of SAT is reported due to the underlying SARS COV-2. As Covid-19 is affecting people throughout the world, the possibility is that millions of people are likely to have SAT due to Covid-19.

Conclusion

This case emphasizes the importance of considering extrapulmonary complications of the Covid-19. Covid induced thyroiditis should be considered if there are suggestive symptoms and signs. As in our case, it usually responds well to anti-inflammatory medications.

Acknowledgement: The author would like to thank Dr Sabeen zia of IRNUM (Institute of radiology and nuclear medicine) Peshawar, for helping in literature review and

Dr. Adnan Rehman for assistance in drafting.

Disclaimer: None.

Conflict of Interest: None.

Funding Disclosure: None.

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