DOI: 10.4274/gulhane.galenos.2023.27146
Gulhane Med J 2024;66:58-61

Post COVID-19 subacute thyroiditis-de Quervain: a case series

Merita Emini Sadiku[1], Izet Sadiku[2], Mimoza Ramadani Piraj[3]

[1]University of Prishtina Faculty of Medicine, University Clinical Center of Kosova, Clinic of Endocrinology, Endoclinic-Medical Laboratory, Prishtina, Kosova
[2]University Clinical Center of Kosova, Clinic of Infectious Diseases, Endoclinic-Medical Laboratory, Prishtina, Kosova
[3]University Clinical Center of Kosova, Clinic of Endocrinology, Prishtina, Kosova

Date submitted:
05.04.2023
Date accepted:
20.09.2023
Online publication date:
08.03.2024

Corresponding Author:
Izet Sadiku, M.D., University Clinical Center of Kosova, Clinic of Infectious Diseases, Endoclinic-Medical Laboratory, Prishtina, Kosova
+38344124029
izadoc@yahoo.com

ORCID:
orcid.org/0000-0002-8682-948X

Keywords: Subacute thyroiditis, COVID-19, pandemic, case series

ABSTRACT

The Coronavirus disease of 2019 (COVID-19) pandemic had a public impact on various dimensions, including multisystemic complications. One such complication is subacute thyroiditis (SAT), also called subacute granulomatous or de Quervain thyroiditis, in which the severe acute respiratory syndrome-Coronavirus-2 virus affects thyroid tissue. Here we report seven patients with SAT and positive for COVID-19 and real-time quantitative-polymerase chain reaction. Neck pain was the most common symptom, followed by headache, fatigue, lethargy, and fever. Ultrasound revealed typical findings of the SAT. Corticosteroid treatment resulted in a complete improvement of inflammatory parameters and normalization of thyroid hormone levels. Our findings highlight the importance of considering rare cases of SAT as a potential complication of COVID-19. This report can also help physicians from various disciplines to identify such complications and provide better care for COVID-19 patients.

Introduction

Subacute thyroiditis (SAT) is an isolated disease of viral origin, with possible pathogens including mumps virus, hepatitis B and C viruses, cytomegalovirus, enterovirus, and coxsackie viruses A and B (1). SAT is characterized by a three-phase clinical course of thyrotoxicosis, followed by euthyroidism and sometimes hypothyroidism (2). Clinically, SAT is associated with severe pain that is localized to the anterior part of the neck and may radiate up to the jaw or ears, tenderness of the thyroid gland upon palpation, and specific manifestations including fever, fatigue, asthenia, tremor, and sweating as thyrotoxicosis symptoms (3).

The Coronavirus disease of 2019 (COVID-19) pandemic was announced in Kosovo in March 2020. Multiorgan effects of the virus were shown on diabetes very early, while its consequences in other endocrine glands remained unclear until recently. However, shortly after May 2020, the first case of SAT after a COVID-19 record was reported, prompting further observation of its spread.

We investigated the clinical and laboratory characteristics and follow-up data of patients with SAT in COVID-19 patients in Kosovo.

Case Presentation

This patient series included 7 individuals diagnosed and treated with SAT. All patients were admitted to the Outpatient Clinic of Endocrinology of the University Clinical Center of Kosovo or the Endoclinic Policlinic between May 2020 and May 2021. Demographic, clinical, biochemical, and imaging records were available in the medical health records. We informed the patients about this case series presentation and obtained their informed consent.

Of the seven cases, six were women and the age range was 17 to 65 years. All but one were young and did not have comorbidities. One patient had undergone thyroid lobectomy a few years previously. Six individuals presented with neck pain, and one patient showed atypical symptoms such as fear and no neck pain. Headache, odynophagia, fatigue, laziness, fever, and signs of thyrotoxicosis (e.g., tachycardia, anxiety, and insomnia) were common. The time between the onset of SAT symptoms and diagnosis was 5 to 30 days after COVID-19. Six patients had confirmed past real-time quantitative-polymerase chain reaction positive COVID-19, whereas one patient was diagnosed through serological tests (IgM and IgG).

Biochemical tests showed increased levels of C-reactive protein (CRP), erythrocyte sedimentation rate, total and free fractions of thyroxine (FT4) and triiodothyronine (FT3), and reduced thyroid-stimulating hormone (TSH). The gland was soft but painful on palpation, as confirmed by ultrasound examination. Typical ultrasonography findings of SAT were identified, including heterogeneous parenchyma and central hypoechoic areas (Figure 1) and reduction of radioiodine uptake in SAT scintigraphy (Figure 2).

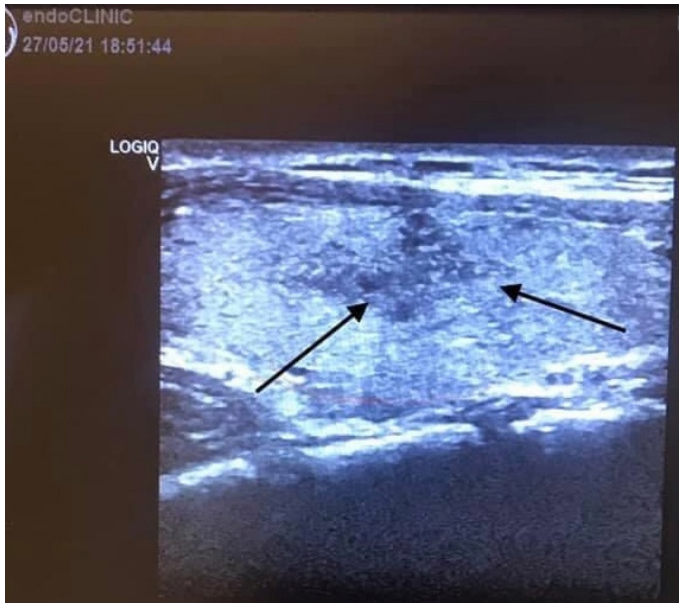

Figure 1. Ultrasound signs of SAT: longitudinal view of thyroid left lobe with hypoechoic field in the center (patient number 1 from Table 1)
SAT: Subacute thyroiditis

Almost all patients were treated with corticosteroids or non-steroidal anti-inflammatory drugs, leading to complete improvement of inflammatory parameters and normalization of thyroid hormones (Table 1). Vitamin D supplementation at a dosage of 2000-5000 IU/day was prescribed for most patients.

Discussion

In this study, we found that almost all patients with SAT after COVID-19 had a typical clinical presentation and responded well to corticosteroid treatment. Because large clinical studies with patients with SAT after COVID-19 have not been published, case reports or series and systematic reviews dominate the literature. The most plausible theory explaining direct cellular damage in thyroid tissues due to COVID-19 is that the Severe acute respiratory syndrome-Coronavirus-2 virus identifies angiotensin-converting enzyme-2 and TMPRSS2 mRNA receptors as cellular entrance receptors, and these receptors are expressed in follicular thyroid cells (4-6). Direct follicular cell damage can spread thyroid hormones into the plasma, explaining the thyrotoxic clinical features (e.g., tachycardia, anxiety, insomnia).

In terms of clinical, imaging, and laboratory features, SAT after COVID-19 is unlikely to differ from SAT of other viral origins (mumps, rubella, influenza, coxsackie, adenovirus, varicella-zoster virus, cytomegalovirus, Epstein-Barr virus, hepatitis E, and HIV) (7). SAT after COVID-19 also presents with classical clinical features of neck pain, anxiety, and thyrotoxicosis (high FT3 and FT4 and suppressed TSH) and typical ultrasound findings (8), as well as high inflammatory markers such as CRP, as shown in our cases.

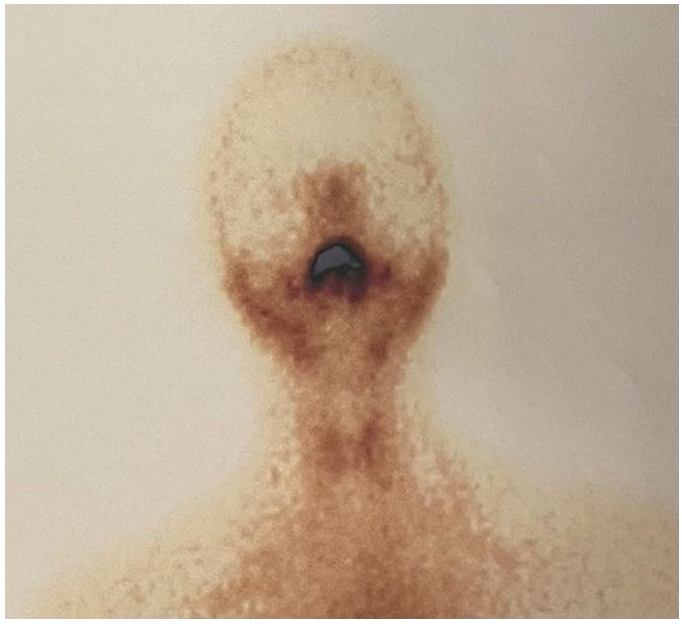

Figure 2. Reduction of radioiodine uptake in SAT scintigraphy (patient number 7 from Table 1)
SAT: Subacute thyroiditis

Table 1. Demographic, clinical, biochemical, imaging and treatment data in patients with SAT after COVID-19

Patients no-years/ gender	COVID-19 diagnosis	Time (days) onset of SAT after COVID-19	Pulses/ minute	Thyroid ultrasound/ imaging	Specific therapy	Before treatment thyroid hormones	Other analyses	After treatment thyroid hormones	Other analyses
1-65/M	RT-PCR	30	100	Heterogeneous parenchyma and central hypoechoic areas	Prednisone 25 mg/ day, indomethacin 150 mg/day, propranolol 80 mg/ day	T4 265 nmol/L FT3 3.48 pmol/L TSH 0.05 mIU/mL	CRP 104 mg/L ES 57 mm/h	FT4 14.75 pmol/L FT3 3.04 pmol/L TSH 0.6 mIU/mL	CRP 4.0 mg/L ES 13 mm/h
2-39/F	RT-PCR	30	120	Heterogeneous parenchyma	Prednisone 40 mg/ day, propranolol 80 mg/day	T4 237.5 nmol/L FT3 6.4 pmol/L TSH 0.05 mIU/mL	CRP 60 mg/L ES 80 mm/h	T4 136 nmol/L FT3 2.4 pmol/L TSH 1.0 mIU/mL	CRP 6.0 mg/L ES 30 mm/h
3-42/F	RT-PCR	5	110	Heterogeneous echo texture and central hypoechoic areas, enlarged thyroid	Prednisone 25 mg/ day, propranolol 40 mg/day	FT4 42 pmol/L FT3 7.2 pmol/L TSH 0.04 mIU/mL	CRP 70 mg/L ES 40 mm/h	FT4 15.7 pmol/L FT3 4.5 pmol/L TSH 0.97 mIU/mL	CRP 2 mg/L ES 15 mm/h
4-26/F	RT-PCR	7	90	Central hypoechoic areas	Indomethacin 150 mg/day	FT4 39 pmol/L FT3 8 pmol/L TSH 0.01 mIU/mL	CRP 90 mg/L ES 50 mm/h	FT4 18.1 pmol/L FT3 5.2 pmol/L TSH 1.2 mIU/mL	CRP 3 mg/L ES 12 mm/h
5-47/F	RT-PCR	14	125	Heterogeneous echo texture and central hypoechoic areas	Prednisone 25 mg/ day, propranolol 40 mg/day	FT4 41 pmol/L FT3 7.5 pmol/L TSH 0.09 mIU/mL	CRP 100 mg/L	FT4 14.2 pmol/L FT3 4.1 pmol/L TSH 0.97 mIU/mL	CRP 4 mg/L
6-17/F	IgM and IgG SARS-CoV-2	30	105	Heterogeneous echo texture	Indomethacin 150 mg/day	FT4 28 pmol/L FT3 7 pmol/L TSH 0.1 mIU/mL	CRP 88 mg/L ES 55 mm/h	FT4 19.51 pmol/L FT3 4.29 pmol/L TSH 1.5 mIU/mL	CRP 5 mg/L
7-42/F	RT-PCR	7	100	Hypoechoic areas	Prednisone 40 mg/ day, propranolol 20 mg/day	FT4 30 pmol/L FT3 7.1 pmol/L TSH 0.02 mIU/mL	CRP 60 mg/L	FT4 12.8 pmol/L FT3 1.4 pmol/L TSH 2.6 mIU/mL	CRP 4 mg/L ES 10 mm/h

This table describes the data related to the time of onset of the SAT, which varied from 5-30 days after the COVID-19 infection, followed by the clinical and imaging data at admission as well as the laboratory data at the beginning and after the treatment, which apparently show the improvement of inflammatory parameters and thyroid hormones.
RT-PCR: Real-time quantitative-polymerase chain reaction, M: Male, F: Female, COVID-19: Coronavirus disease-2019, SARS-CoV-2: Severe acute respiratory syndrome-Coronavirus-2, SAT: Subacute thyroiditis, CRP: C-reactive protein, ES: Erythrocyte sedimentation, FT4: Thyroxine, FT3: Triiodothyronine, TSH: Thyroid-stimulating hormone

Similar to other etiologies, the treatment of SAT after COVID-19 includes short-term corticosteroids, beta-adrenergic receptor blockers, and analgesics (9). On the other hand, in most cases, corticosteroids with a lower average dose of 25-30 mg/day have been used compared with SAT of other viral origins. Increased predisposition to systemic infections, impaired immune responses, or even the development of autoimmune diseases due to vitamin D insufficiency have been reported (10). Nevertheless, more studies on the benefits and prognostic role of vitamin D supplements in COVID-19 are warranted (11).

Our series included more women than men; no patient required hospitalization or developed hypothyroidism, and all patients showed mild COVID-19. Similar results were reported in a study that compared patients with mild or severe COVID-19 pneumonia. None of the hospitalized patients with mild pneumonia had hypothyroidism, whereas 3.2% of those with severe pneumonia did have hypothyroidism (12).

The presentation of such cases is crucial for physicians of different specialties to identify potential complications of COVID-19, especially rare cases such as SAT that may be overlooked during routine clinical practice. Recognition of this clinical entity is important because timely treatment can lead to a complete return to normal thyroid function. However, it is essential to investigate the possibility of hypothyroidism at a later stage. Adequate follow-up after recovery from COVID-19 is necessary because SAT, except in the early phase, may be found even several months after the initial infection.

Conclusion

Our findings contribute to the growing body of evidence on the impact of COVID-19 on the endocrine system and can help physicians identify and manage potential complications such as SAT.

Ethics

Informed Consent: We informed the patients about this case series presentation and obtained their informed consent.

Authorship Contributions

Surgical and Medical Practices - Concept - Design - Data Collection or Processing - Analysis or Interpretation - Literature Search - Writing: M.E.S., I.S., M.R.P.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Yasuji I. Subacute thyroiditis in a patient with juvenile idiopathic arthritis undergoing etanercept treatment: a case report and review of the literature. Modern Rheumatology. 2013;23:397-400.
2. Campos-Barrera E, Alvarez-Cisneros T, Davalos-Fuentes M. Subacute Thyroiditis Associated with COVID-19. Case Rep Endocrinol. 2020;2020:8891539.
3. Alfadda AA, Sallam RM, Elawad GE, Aldhukair H, Alyahya MM. Subacute thyroiditis: clinical presentation and long term outcome. Int J Endocrinol. 2014;2014:794943.
4. Li MY, Li L, Zhang Y, Wang XS. Expression of the SARS-CoV-2 cell receptor gene ACE2 in a wide variety of human tissues. Infect Dis Poverty. 2020;9:45.
5. Lisco G, De Tullio A, Jirillo E, et al. Thyroid and COVID-19: a review on pathophysiological, clinical and organizational aspects. J Endocrinol Invest. 2021;44:1801-1814.
6. Lazartigues E, Qadir MMF, Mauvais-Jarvis F. Endocrine Significance of SARS-CoV-2's Reliance on ACE2. Endocrinology. 2020;161:bqaa108.
7. Desailloud R, Hober D. Viruses and thyroiditis: an update. Virol J. 2009;6:5.
8. Aemaz Ur Rehman M, Farooq H, Ali MM, Ebaad Ur Rehman M, Dar QA, Hussain A. The Association of Subacute Thyroiditis with COVID-19: a Systematic Review. SN Compr Clin Med. 2021;3:1515-1527.
9. Brancatella A, Ricci D, Cappellani D, et al. Is Subacute Thyroiditis an Underestimated Manifestation of SARS-CoV-2 Infection? Insights From a Case Series. J Clin Endocrinol Metab. 2020;105:dgaa537.
10. Bouillon R, Marcocci C, Carmeliet G, et al. Skeletal and Extraskeletal Actions of Vitamin D: Current Evidence and Outstanding Questions. Endocr Rev. 2019;40:1109-1151.
11. Mitchell F. Vitamin-D and COVID-19: do deficient risk a poorer outcome? Lancet Diabetes Endocrinol. 2020;8:570.
12. Güven M, Gültekin H. The prognostic impact of thyroid disorders on the clinical severity of COVID-19: Results of single-centre pandemic hospital. Int J Clin Pract. 2021;75:e14129.