

Subacute thyroiditis: New entity?

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ABSTRACT

In 2021, the scientific community was marked by the introduction of vaccine against COVID-19. This is major step in overcoming the pandemic, but it does not mean that several side effects or precautions are not related to the immunization; however, the current level of statistical evidence concerning potential negative effects is low, as logically expected at this point. We aim to introduce a female case who was confirmed with subacute thyroiditis after COVID-19 vaccination. Prompt recognition of subacute thyroiditis avoids unnecessary investigations, hospitalizations or even exposure to antibiotics as seen in this case. Early intervention with anti-inflammatory medication releases the symptoms. The association with vaccine against COVID-19 might be incidental or not; more evidence is needed but as far as we might think nowadays, the connection is possible, thus the importance of specific awareness.

Keywords: thyroid, thyroiditis, virus, vaccine, subacute thyroiditis, inflammation, COVID-19, coronavirus, vaccination, immunization

INTRODUCTION

In 2021, the scientific community was marked by the introduction of vaccine against COVID-19 (1,2,3). This is major step in overcoming the pandemic, but it does not mean that several side effects or precautions are not related to the immunization; however, the current level of statistical evidence is low, as logically expected at this point (5,6,7). It has been suggested, but not clearly proven, that immunization against COVID-19 might induce Guillain-Barré syndrome, hepatitis/acute hepatic failure, worsening of some immune-mediated neurological, skin and cardiac conditions etc. (8,9,10).

AIM

We aim to introduce a female case who was confirmed with subacute thyroiditis after COVID-19 vaccination.

METHOD

This is case presentation. The patient agreed to anonymously introduce the data below.

CASE PRESENTATION

Admission

This is a 54 years old non-smoking female, coming from non-endemic area, who was admitted for the following clinical picture (since last 2-3 weeks): dry cough, odynophagia, fever (maximum 39.4 degrees Celsius). She does not have a relevant medical history, neither a family medical history.

Recent medical history

Her recent medical history was the following: at first she was treated at home with antibiotics (doxycycline), then she was hospitalized at the Infectious

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Diseases Service where she received treatment with meropenem and azithromycin without clinical response. The investigations that were performed, including computed tomography of the thorax and abdomen, and blood cultures did not detect any cause of the symptoms. In the meantime, she was tested several times for SARS-CoV-2 PCR and found negative. Then, following an otorhinolaryngology (ORL) consultation, a subacute thyroiditis was suspected and referred to endocrinology. 3 weeks before the first symptoms, the patient had the second dose of vaccine against COVID-19 (Pfizer) (Table 1).

TABLE 1. Timing of vaccination, symptoms and medical evaluations until subacute thyroiditis diagnosis was established

Timing	Event
23.09.2021	Pfizer dose 1-no severe adverse reaction
14.10.2021	Pfizer dose 2-no adverse reactions
5-8.11.2021	dry cough, odynophagia
7-8.11.2021	Fever (maximum 38.6 degrees Celsius); initially treatment with doxycycline for 5 days with no improvement
8-20.11.2021	Worsening of odynophagia
22-25.11.2021	Hospitalization at the Infectious Diseases Service; treatment with meropenem and azithromycin without clinical response
25.11.2021	ORL consultation: suspicion of subacute thyroiditis
26.11.2021	Hospitalized (as emergency) at Endocrinology Department: confirmation of subacute thyroiditis

TABLE 2. The biochemistry panel of a 54-year-old female confirmed with subacute thyroiditis

Parameter	Value- 26.11.2021	Value- 29.11.2021	Normal ranges	Units
Uric acid	3.2		2.6-6	mg/dl
ALT (Alanine aminotransferase)	9	12.3	0-31	U/l
AST (Aspartat aminotransferase)	14	10.8	0-32	U/l
Conjugated bilirubin	0.13		0-0.5	mg/dl
Total bilirubin	0.3		0.2-1.2	mg/dl
Ionic serum calcium	4.58		3.9-4.9	mg/dl
Total serum calcium	9.6		8.4-10.2	mg/dl
Total cholesterol	109		0-200	mg/dl
Alkaline phosphatase		131	38-105	U/l
Serum phosphorus	3.8		2.3-4.7	mg/dl
Fasting glycaemia	103	74.4	70-105	mg/dl
HDL-cholesterol	18		40-60	mg/dl
LDL-cholesterol	69		60-160	mg/dl
Potassium	4.3		3.5-5.1	mmol/l
Magnesium	2.7		1.6-2.55	mg/dl
Sodium	141		136-145	mmol/l
Total proteins	6.2		6.4-8.3	g/dl
Triglycerides	105		0-149	mg/dl
Urea	29		15-50	mg/dl
Creatinine	0.5		0.5-1.2	mg/dl
CRP (C reactive protein)	7.368	1.229	0-0.5	mg/dl
ESR (erythrocyte sedimentation rate)	105	77.4	1-25	mm/1-h
Fibrinogen	823	624	200-500	mg/dl

Endocrine evaluation

Clinical examination showed a small goiter, with inhomogeneous consistence, associating local spontaneous pain and at palpation, and also pain when swallow; no signs of hyperthyroidism. Biochemistry panel showed a typical inflammatory picture (Table 2).

Thyroid assays confirmed thyrotoxicosis, but also a component of autoimmune thyroiditis (Table 3). Morning plasma cortisol was 9.75 µg/dl (normal ranges between 4.82 and 19.5 µg/dl).

TABLE 3. The endocrine panel of an adult female with subacute thyroiditis

Parameter	Value	Normal ranges	Units
TSH (thyroid stimulating hormone)	0.0081	0.5-4.5	µUI/ml
FT4 (free levothyroxine)	22.84	9-19	pmol/l
T3 (triiodothyronine)	116.4	80-200	ng/dl
ATPO (anti-thyroperoxidase antibodies)	4.99	0-5.61	UI/ml
ATG (anti-thyroglobulin antibodies)	203.6	0-115	UI/ml
TRAB (thyroid stimulating antibody)	0.8	0-1.75	UI/l

Thyroid ultrasound showed hypoechoic, intense inhomogeneous structure, with slightly increased vascularity, and no lymph nodes involvement.

Therapy

The antibiotics were stopped. Corticotherapy was introduced: prednisone 25 mg/day, 14 days followed by 20 mg/day, 14 days, then 15 mg/day, 14 days, followed by 10 mg/day, 14 days, then 5 mg/day, 14 days, and then 5 mg every other day for 14 days. Periodic check-up is required.

DISCUSSIONS

We introduce a typical case of subacute thyroiditis without relevant short term and long term prior medical history. On admission at endocrinology, the clinical picture was highly suggestive for the disease, as well as increased inflammatory markers in addition to confirmation of thyrotoxicosis (which was not clinically relevant). But, until the condition was recognized, essential thyroid evaluation was not performed (10,11). Routine TSH and thyroid ultrasound are imperative under these circumstances (during pandemic as well) (12,13). Interestingly, the patient had a complex panel of investigations and she was offered multiple regimes of antibiotics before the actual diagnostic amid pandemic (fever of unknown cause).

Another important aspect which is probably the clue of the case is represented by the close relationship between clinical onset and vaccination against COVID-19. In 2021, a few papers addressed the issue of developing subacute thyroiditis after immunization against coronavirus (14-27). Females are prone to the condition, as generally known; in cases with-

out typical clinical picture, fine needle aspiration-based cytological examination might help, but it is not routinely indicated (28,29,30). A prior thyroid condition or syndromic circumstance does not increase the risk (31,32).

Another particular aspect of the case was the co-detection of positive anti-thyroid antibodies. Generally, a person diagnosed with an autoimmune thyroid condition associates a higher risk of another endocrine or non-endocrine autoimmune conditions, but not necessarily of subacute thyroiditis (33,34,35). Limited data are published so far on potential link between vaccination against COVID-19 and thyroid issues which do not limit the indication of immunization according to doses and booster doses that are recommended for general population (36). On the other hand, we already know that the coronavirus infection itself causes subacute thyroiditis (37-50).

CONCLUSIONS

Prompt recognition of subacute thyroiditis avoids unnecessary investigations, hospitalizations or even exposure to antibiotics as seen in this case. Early intervention with anti-inflammatory medication releases the symptoms. The association with vaccine against COVID-19 might be incidental or not; more evidence is needed but as far as we may think nowadays, the connection is possible, thus the importance of specific awareness.

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