

Subacute Thyroiditis Following COVID-19 Vaccination

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Abstract

Subacute thyroiditis (SAT) is an inflammatory thyroid disease of post-viral origin; linked with many viruses such as SARS-COVID-2. The objective of this work is to report a case of SAT associated with COVID-19 vaccination, in a healthy patient with no history of previous COVID-19 or upper respiratory tract infection.

Title: Subacute Thyroiditis Following COVID-19 Vaccination

Short running title: Subacute Thyroiditis and COVID-19 Vaccine

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Subacute Thyroiditis Following COVID-19 Vaccination

To the editor,

Subacute thyroiditis (SAT), also known as De Quervain's thyroiditis, is a self-limited inflammatory thyroid disorder presenting with radiating neck pain, fever and a cluster of symptoms resulting from the thyrotoxicosis caused by destruction of follicular epithelium and loss of follicular integrity. Upper respiratory tract viral infections antecede most SAT cases; supporting a post-viral inflammatory response origin. Many viruses, such as influenza, adenovirus, and Coxsackie virus have been identified as responsible pathogens¹⁻⁴. With the COVID-19 pandemic taking the world by storm, there have been a few case reports on SAT following severe acute respiratory syndrome coronavirus 2 (SARSCOV-2) infection¹⁻². To our knowledge, SAT has not yet been reported as a result of COVID-19 vaccination in an otherwise healthy individual, regardless of the vaccine type. We hereby describe a COVID-19 vaccine-related case of subacute thyroiditis.

A 34-yr-old woman, with negative history of previous proven or suspicious COVID-19 infection, received her first dose of COVAXIN (The Bharat Biotech COVID-19 Vaccine) on April 3rd 2021, with onset of expected symptoms, mainly fatigue, myalgia and mild fever about 12 hours post-injection, gradually resolving over the next 72 hours. During the 5th-7th day post vaccination, she experienced gradual onset of intermittent mild fever, palpitation and radiating anterior neck pain, which she initially thought of as extended post-vaccination symptoms. She consulted an internal medicine specialist due to persistence of symptoms, 11 days post-vaccination. At physical examination, the thyroid gland was tender to touch and mildly enlarged, with no palpable thyroid nodule. The patient had no history of prior thyroid disorder or any type of high iodine exposure. She was referred for 99mTechnetium-pertechnetate thyroid scintigraphy on the same day, demonstrating global, moderate to severely decreased radiotracer uptake of the thyroid gland and increased background activity; compatible with subacute thyroiditis (Fig.1). The subsequently performed ultrasound examination revealed heterogeneity and decreased vascularity of the thyroid gland. The simultaneously acquired laboratory data portrayed thyrotoxicosis with suppressed thyrotropin (TSH) and elevated free thyroxine (FT4), free triiodothyronine (FT3) levels. Erythrocyte sedimentation rate and C-reactive protein levels were high and borderline upper limit of normal, respectively (Table 1). Subacute thyroiditis was confirmed; however, the patient had no history upper respiratory tract infection or otherwise viral infection symptoms during the past 3 months (except for the previously-described post-vaccination symptoms), she had no history of recent travel during the past couple of months and followed the social distancing rules vigorously, having had no close or unprotected contact with any known or suspected SARSCOV-2-positive case. Her concurrent chest CT scan indicated that her lungs were clear with no sign of any current or prior sequels of COVID-19 infection or other causes of pneumonia. Therefore, it is logical to assume that in this case, SAT developed following the inflammatory response to COVAXIN. As expected, the patient showed satisfactory response to oral prednisolone treatment.

Having been associated with various strains of viruses, SAT is recognized to have a viral, or to be more specific, post-viral inflammatory response, origin¹⁻⁴. To this date, a few cases have been reported of SAT developing after influenza and H1N1 vaccination in healthy individuals with no history of prior viral upper respiratory tract infection, suggesting that attenuated/inactivated viral vaccines may rarely trigger SAT onset as well^{3, 4}. The ongoing COVID-19 pandemic has urged countries all over the world to eagerly pursue national vaccination programs, with multiple pharmaceutical companies vigilantly developing, testing and modifying new vaccines every day⁵. While there have been a few reports on COVID-19-associated SAT^{1, 2}, no similar observation has been reported so far for COVID-19 vaccines, regardless of vaccine type. The chronological events of our case suggest that COVID-19 vaccination, in this case first dose of COVAXIN administration, may be held accountable for SAT. The fact that SAT is generally an underdiagnosed/misdiagnosed condition becomes more pronounced in vaccine-related cases, since, as in our case, patients are more prone to attribute SAT symptoms to expected flu-like post-vaccination symptoms^{3, 4}. It is not yet clear whether the type of COVID-19 vaccine, in case of COVAXIN being an inactivated whole-virion vaccine⁵, affects the chances of SAT development or not. Nonetheless, we believe physicians should be alerted about the possible association between SAT and COVID-19 vaccination, which even if extremely rare, may translate to significant numbers

considering the large vaccinated population. Given that patients frequently experience flu-like symptoms after COVID-19 vaccination, informing them well about the expected nature and duration of symptoms, advising them to consult their physician if experiencing anterior neck pain, extended fever or palpitation would prevent missing cases of vaccine-related SAT, thereby, facilitating in time diagnosis and treatment.

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Tables:

Table 1. Laboratory Results

Measure	Patient	Reference Range
TSH (IU/L)	0.05	0.36-6.3
T4 (µg/dL)	20.9	4.4-11.7
T3 (ng/mL)	2.7	0.55-1.9
WBC (10 ³ /mm ³)	8.3	4-9
Neut (%)	72	-
Lymph (%)	25	-
ESR	60	4-9
CRP (mg/L)	9.8	Adult < 10

Figure legends:

Figure 1. Thyroid scintigraphy. 10 minutes after IV injection of 111 MBq 99mTc-pertechnetate, static acquisition of neck was performed in anterior and anterior oblique views, by a dual head Siemens gamma camera with a low-energy high-resolution parallel-hole (LEHR-PAR) collimator (magnification 1; matrix 256 × 256, frame 100 Kc). Study reveals global, moderate to severe decreased thyroid radiotracer uptake accompanied by high background activity, compatible with subacute thyroiditis.

