Myositis after SARS-CoV-2 vaccination occurs more frequently than assumed and is probably causally related

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Dear Editor,

We read with interest the article by Camargo-Coronel *et al*. reporting on a systematic review of patients with idiopathic, inflammatory myopathy developing after anti-SARS-CoV-2 vaccinations (1). Thirty-one patients from 21 studies were included; 61% of these patients were females (1). 11 patients were classified as amyopathic dermatomyositis, 9 as dermatomyositis (DM), 8 as polymyositis or immune-mediated, necrotizing myopathy (IMNM), and 3 did not meet the American College of Rheumatology/European League Against Rheumatism criteria for myositis (1). It was concluded that patients with SARS-CoV-2 vaccination-related inflammatory myopathies have a heterogeneous presentation with no specific features; therefore, a causal relationship between vaccination and the development of inflammatory myopathy remains uncertain (1). The study is excellent but has limitations that should be discussed.

The major limitation of the study is that the review is incomplete. Several cases of SARS-CoV-2 vaccination-related myositis were not included in the study.

One is that of a 37-year-old male who developed myocarditis, pulmonary hemorrhage, and extensive myositis with rhabdomyolysis after the first dose of the Biontech Pfizer vaccine (BPV) (2). The serum creatine-kinase rose to 93,046 U/L (2). The patient benefited from methyl-prednisolone plus intravenous immunoglobulins (IVIGs) (2).

Another case that was not considered is that of a 22-year-old female who developed anti-3-hydroxy-3-methylglutaryl-coenzyme A reductase IMNM 7 days after receiving the first BPV dose (3). The patient did not benefit from steroids, methotrexate, or IVIGs (3).

Another case that was not included is that of a 67-year-old female who developed focal myositis 2 days after the second BPV dose (4). The patient was successfully treated with methyl-prednisolone, IVIGs, methotrexate, and hydroxyl-chloroquine (4).

There was also no discussion of the case of a 71-year-old female with refractory IMNM 2 weeks after the second dose of the mRNA-1273 vaccine (5). Steroids were ineffective, which is why IVIGs and rituximab were added, but their effects were not reported (5).

In a study on 53 patients with DM, the SARS-CoV-2 vaccination was identified as the cause of DM in the 3 patients (6). This study also found that SARS-CoV-2 vaccinations can lead to flares of already existing DM (6).

Another limitation is that at least 16 of the included patients had no muscle biopsy performed or it was unavailable (1). In 12 of them, no electromyography data were available. In these patients, myositis was diagnosed exclusively on the presence of myositis-specific antibodies or myositis-associated antibodies (MAA) (1). In particular, MAA can be non-specific and occur in disorders other than myositis, such as systemic lupus erythematosus, Sjögren's syndrome, or idiopathic pulmonary fibrosis (7).

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We disagree that the heterogeneous clinical presentation argues against a causal relationship between vaccination and myositis (1). The immune response to SARS-CoV-2 vaccines can vary from patient to patient, which is why the clinical presentation of side effects can also vary. Nevertheless, vaccination is probably responsible for the adverse reaction.

Overall, the interesting review by Camargo-Coronel et al. has limitations that call into question the results and their interpretation. Addressing these issues would strengthen the conclusions and could improve the status of the study. The number of patients with SARS-CoV-2 vaccination-related myositis is higher than expected. Patients with symptoms and signs indicative of myositis after SARS-CoV-2 vaccination should immediately undergo myositis evaluation to avoid wasting time until appropriate treatment is started.

Contributions

JF, conception, organization, execution, writing of the first draft, review and critique of the manuscript; FS, AS, conception, organization, review and critique of the manuscript.

Conflict of interest

The authors declare no potential conflict of interest.

Ethics approval and consent to participate

The authors confirm that the approval of an institutional review board or patient consent was not required for this work. We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines. This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

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Availability of data and materials

Data and materials are available from the corresponding author upon request.

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