


## LETTER TO EDITOR

# Reply to ‘Letter to the Editor: Acute hypersensitivity myocardial infarction (Kounis syndrome) and hypersensitivity myocarditis following COVID-19 vaccine vaccination’

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We thank Professor Kounis *et al.* for the comments and insight in response to our recent article, Acute Myocardial Infarction and Myocarditis following COVID-19 vaccination.

Following the introduction of the coronavirus disease 2019 (COVID-19) vaccine, many articles have highlighted the observation of vaccine-induced myocarditis and acute myocardial infarction (AMI). Our review revealed that vaccine-induced myocarditis more commonly affects younger males, whereas vaccine-related AMI affects an older population.<sup>1,2</sup>

There have been several hypothesis suggesting mechanisms underlying these vaccine-related cardiac events.<sup>3</sup> As Professor Kounis highlighted, the pathogenesis of these cardiac events is poorly understood due to the lack of histological testing and evidence. While case studies on histological evidence obtained from patients with myocarditis seem to suggest hypersensitivity reaction,<sup>4–6</sup> the cause of post-vaccination AMI is less straightforward. Current hypotheses include autoimmune response against platelets, autoimmune heparin-induced thrombocytopenia,<sup>7,8</sup> vaccination stress, polymorbid vaccination stress and Kounis syndrome.<sup>9–11</sup>

The authors also suggested to consider vaccine excipients as possible allergenic triggers.<sup>12,13</sup> It would be unfortunate to exclude patients from vaccination amid a global pandemic in view of safety reasons towards vaccine excipients. Clinically, it is difficult to determine whether the allergic reaction is towards the vaccine or the vaccine excipient. Amid the global pandemic, we believe it would be prudent to examine all

ingredients included in the production of the COVID-19 vaccine, rather than prematurely attribute the COVID-19 vaccine as the sole causality for vaccine-related cardiac events. From a public health perspective, we support Prof. Kounis’s suggestion of making COVID-19 safer with the use of less immunogenic materials.

*Funding.* None declared.

*Conflict of interest.* None declared.

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Submitted: 5 January 2022

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