THE ANATOLIAN JOURNAL OF CARDIOLOGY

Official journal of the TURKISH SOCIETY OF CARDIOLOGY

Rare Hypersensitivity Myocardial Reactions Following COVID-19 Vaccination: Hypersensitivity Myocardial Infarction (Kounis Syndrome) and Hypersensitivity Myocarditis

LETTER TO THE EDITOR

Previous epidemiological data have demonstrated that approximately 85% of vaccine anaphylaxis cases had a history of prior allergic disease and that women are at a greater risk than men.[1-3] In this concept, the published report in *Anatolian Journal of Cardiology*[4] concerning a 22-year-old woman with previous egg and tomato allergy and drug allergies to unknown medicines who developed acute myocardial infarction (AMI) of the Kounis type following the first dose of COVID-19 vaccine (BNT162b2, Pfizer-BioNTech) is very important. It raises important issues on Kounis hypersensitivity AMI, hypersensitivity myocarditis, and future measures in order to avoid and prevent these rare COVID-19 vaccine hypersensitivities.

Indeed, in only 9, so far, worldwide reports of AMI following COVID-19 vaccines, the authors have speculated on Kounis hypersensitivity-associated AMI despite the absence of atopic background. Specifically, Kounis syndrome-like AMI has occurred in 2 patients after the Moderna vaccine,[5,6] in an 86-year-old[7] and in a healthy 96-year-old[8] female following the first dose of Pfizer–BioNTech and Moderna vaccine, respectively, in a 62-year-old woman[9] after the first dose of AstraZeneca, in a 41-year-old woman[10] after the first dose of inactivated coronavirus vaccine (Sinovac Life Sciences, Beijing, China), in a healthy 63-year-old[11] and two, 46- and 48-year-old males[12] after the Covishield vaccine, respectively (similar to AstraZeneca that is manufactured in India). All of the above vaccines contain excipients such as polysorbate 80 (AstraZeneca and Covishield), polyethylene glycol, also known as macrogol or PEG (Pfizer-BioNTech and Moderna), and tromethamine, also known as trometamol (Moderna) that could potentially induce hypersensitivity reactions.

Myocarditis after the first dose of Pfizer–BioNTech vaccine has been reported in a 21-year-old man with a previous history of atopic asthma in childhood and pollen and pet allergy.[13] Moreover, in 1 fatal case from Korea,[14] in 2 patients from the United States,[15] and in 1 patient from Israel,[16] who demonstrated mRNA COVID-19 vaccination-induced-myocarditis, a myocardial biopsy revealed myocardial infiltration by eosinophils and other inflammatory cells. All of the above support the view that COVID-19 vaccine-associated myocarditis seems similar to hypersensitivity myocarditis[17] which is a subtype of eosinophilic myocarditis. Of these patients, 36.5% may have not peripheral eosinophilia and most patients respond well to drug removal or steroid administration.[18]

Creams, ointments, lotions, cosmetics, and dental materials also contain polysorbate and polyethylene glycol (PEG), as excipients, that are able to sensitize their users. It has been reported that 1-5.4% of the general population has been sensitized to cosmetics or dental materials.[19] Therefore, hypersensitivity-induced Kounis syndrome and hypersensitivity myocarditis could be induced by the above materials. This fact has forced researchers to suggest alternative and different[20] excipients in vaccine manufacturing if vaccine component-induced hypersensitivity is confirmed by further systematic future investigations.[1] Searching for agents that are able to reduce immunogenicity, improve stability, suppress oxidative damage, and prevent thrombotic and cardiovascular events is very important.

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Cite this article as: Kounis NG, Koniari I, Mplani V, et al. Rare hypersensitivity myocardial reactions following COVID-19 vaccination: hypersensitivity myocardial infarction (Kounis syndrome) and hypersensitivity myocarditis. Anatol J Cardiol 2022;26(3):245-246.

DOI:10.5152/AnatolJCardiol.2022.1573

COVID-19-free allergenic vaccines might prove more suitable and more beneficial without inducing these, indeed very rare, hypersensitivity Kounis syndrome and hypersensitivity myocarditis.

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