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Cutaneous adverse effects of the available COVID-19 vaccines



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Abstract Vaccination has played a crucial role in the improvement of global health. Some of the world's deadliest diseases, like smallpox and rinderpest, have been eradicated with the help of vaccines, and many others have been restrained. The appearance of the strain of coronavirus disease 2019 (COVID-19) severe acute respiratory syndrome coronavirus 2 and its impact on global health have made the development of effective and safe vaccines crucial for this new lethal disease. So far, there are three main types of COVID-19 vaccines in use around the world: messenger RNA-based vaccines, adenoviral vector vaccines, and inactivated whole-virus vaccines. Some of them have passed through phase 3 of safety and efficacy trials and are widely used for prophylaxis of COVID-19 infection. A plethora of cutaneous adverse events have been reported, most of them mild or moderate injection-site reactions. Some rare delayed inflammatory reactions such as "COVID arm" have also been reported, posing questions on their pathophysiology and clinical importance. Some rare serious adverse events, such as vaccine-induced prothrombotic immune thrombocytopenia and anaphylaxis, have been described raising great concerns on the safety of some widely spread vaccines. More data need to be collected with further and more detailed analysis. The overall risk of such severe adverse reactions remains extremely low, and the benefits of the existing vaccines in combating the widespread threat of COVID-19 continue to outweigh the risk of their side effects.

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Introduction

Vaccination has played a crucial role in the improvement of global health.¹ Smallpox, a deadly infectious disease, has been eradicated by vaccines. At the same time, there are worries about possible reactions to vaccines. The frequency of reported vaccine-induced adverse events is low and ranges between 4.8 to 83.0 per 100 000 doses of the most

commonly used vaccines. The exact number of genuine allergic reactions to the usual vaccines is not determined, but the estimations vary between one per 500,000 to one per 1 million doses for most vaccines. When the vaccines contain gelatin or egg proteins as in those for influenza, measles, mumps, and rubella virus, rabies, and yellow fever, the serious allergic reactions might be more common, but still, the life-threatening cases of anaphylaxis remain rare (roughly 1 per 1.5 million doses).²

The appearance of the strain of COVID-19 severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its impact on global health have made the development of ef-

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