

Commentary: registered adverse events following COVID-19 immunization in Serbia

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Through the course of the two-year-long fight against the COVID-19 disease on the global scale, it has become clear that immunization is the key factor for prevention and suppression of SARS-CoV-2 infection^{1,2}. Unfortunately, along with the pandemic, a so-called *Infodemia* has spread worldwide, fueling distrust in the safety of COVID-19 vaccines among the general populace. Taking low vaccination rates in many countries into consideration, anti-vaccination movements appear to have had a significant influence on creation of negative attitudes towards COVID-19 immunization. The main culprit is the abundance of misinformation spread widely via social networking sites³⁻⁵. Therefore, now more than ever, should pharmacovigilance be the crucial and most reliable source of all drug safety information, for patients, healthcare professionals and the general public equally. Unfortunately, the situation in Serbia follows the global trend. Despite the exceptional efforts of the Serbian Agency for Medicines and Medicinal Products (*ALIMS*) to provide all necessary information on the safety of available vaccines against the COVID-19 disease, the overall response to vaccination is still unsatisfactory. To help mitigate the negative effects of misleading information, the aim of this commentary is to share available data on adverse events following immunization (*AEFI*) related to COVID-19 vaccination in Serbia. These AEFIs are registered by the National Pharmacovigilance Centre of Serbia in *ALIMS*.

Striving to reach collective immunity as quickly and efficiently as possible, the health authorities of Serbia were among the first in the world to start a mass vaccination against COVID-19 in January 2021, about a year after

the first case of SARS-CoV-2 infection was registered in China⁶. Currently, four preparations different in form and effectiveness⁷ are approved for use in Serbia: *Comirnaty*[®], made by *Pfizer – BioNTech* (Germany/USA), *Vero Cell*[®], made by *Sinopharm* (China), *Sputnik V*[®], made by *NCEM Gamaleya* (Russia), and *Covishield/Vaxzevria*[®], made by *Oxford – AstraZeneca* (The United Kingdom/Sweden). Reports of AEFIs potentially caused by COVID-19 vaccines have been monitored by *ALIMS* and the Institute of Public Health of Serbia “Dr Milan Jovanović Batut” from the very beginning. From December 24 2020 to June 28 2021, a total of 1.017 cases of COVID-19 vaccines-related AEFIs were reported to *ALIMS*. Out of the total number of reported cases, healthcare professionals reported 589, patients 300, and pharmaceutical companies forwarded 128 reports. A detailed brand-related presentation of the number of reported AEFIs to COVID-19 vaccines is given in Table I.

The majority of observed AEFIs is expected and related to local reactions on the vaccine administration site. Such events include pain, swelling and redness, followed by systemic reactions such as fever, muscle pain, joint pain, tremor, weakness, headache and nausea. Among the reported cases, there were more reports of AEFIs in females, most commonly for individuals aged 45 to 64. All reported reactions ended in a few days, spontaneously or with the use of antipyretics or analgesics. These data refer to all four vaccines that are currently in use in the Republic of Serbia.

By May 25, 2021, the Institute of Public Health of Serbia “Dr Milan Jovanovic Batut” submitted to *ALIMS* nine *Conclusions of the Expert*

Table 1. The total number of brand-related AEFIs on COVID-19 vaccines in Serbia[†].

Brand	Manufacturer	AEFIs
Comirnaty [®]	Pfizer/BioNTech, Deutschland/USA	368
Vero Cell [®] , inactivated	Sinopharm, China	326
Sputnik V [®]	NCEM Gamaleya, Russia	175
Covishield/Vaxzevria [®]	Oxford/Astra Zeneca, UK/Sweden	148 [‡]
In total:		1017

[†]From December 24 2020 to June 28 2021. [‡]Covishield[®]: 145

Team on the established severe AEFIs related to COVID-19 vaccines. These include lymphadenitis with reactive phlebitis, suprafascial hematoma, anaphylactoid reaction, urticaria, tongue-tingling, lip-tingling, feeling of discomfort in the area of larynx and Guillain-Barre syndrome (GBS) after administration of Pfizer-BioNTech COVID-19 vaccine (Comirnaty[®]). Furthermore, two cases of allergic reaction after administration of Sinopharm COVID-19 vaccine (Vero Cell[®], inactivated), one case of allergic reaction after administration of Oxford/Astra Zeneca COVID-19 vaccine (Covishield[®]), as well as one case of fever, paresthesia and dysesthesia after administration of Gam-COVID-Vac vaccine (Sputnik V[®]), component I were registered. In one reported case of phlebitis and thrombophlebitis one month after the first dose of the Covishield[®] vaccine, the *National Expert Team* could neither confirm nor rule out a cause-and-effect relationship with the immunization.

To conclude, the publicly available information of AEFI reports related to COVID-19 immunization is an extremely important tool in the battle against the anti-vaccination movements worldwide, including Serbia. Any drug approval is based on potential risk-benefit balance assessment, and no medicine, including vaccines, can be claimed to be completely safe⁸. The experiences from many countries in the world indicate that nowadays more than 90% of COVID-19 patients hospitalized in the intensive care units are not vaccinated. This claim is also supported by the results of several clinical studies⁹⁻¹¹. In the absence of effective medicines to treat the COVID-19 disease, immunization remains the only effective and highly safe public health intervention to prevent the spread of SARS-CoV-2 infection.

Conflict of interest

The Authors declare that they have no conflict of interests.

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