Anaphylactic Reaction Following Receipt of COVID-19 Vaccines: Report of Two Cases

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To the Editor,

Though rare, anaphylactic reactions may occur after vaccine injection. Therefore, it is necessary to equip every vaccination location with trained healthcare personnel and resuscitative equipment to manage probable anaphylaxis. Since there is limited knowledge on adverse reactions of novel COVID-19 vaccine, here we report two cases of anaphylactic reaction after injection of Sputnik-V and Oxford-AstraZeneca COVID-19 vaccines (Detailed presentation on**Supplementary File**). In

A 54-year-old woman was referred to receive the second dose of Sputnik-V vaccine. She denied a history of allergy, angioedema, and anaphylactic reactions, and no severe reactions to childhood vaccines occurred. Immediately after vaccination, a significant injection site bleeding was started. One minute after injection, the patient suddenly developed dizziness, facial angioedema, flushing, severe compressive chest pain, dyspnea, and fear of death. Due to the patient's signs and symptoms, and intravenous (IV) fluid therapy and 100 mg hydrocortisone were initiated. The patient's condition improved in hours, and the symptoms were relieved within two days. However, after 3 weeks, she is suffering from the new onset nasal rhinorrhea and itching.

A 25-year-old man was referred to receive the first dose of AstraZeneca vaccine. He had no history of underlying medical disorders and hypersensitivity reactions. Childhood vaccination was done without any adverse reaction. He underwent the intramuscular (IM) injection of AstraZeneca vaccine. Almost seven hours after vaccination, the patient gradually developed progressive cyanosis and swelling of all fingers of both hands, fever, chills, fatigue, headache, and shortness of breath. Gradually, the patient's clinical condition deteriorated. His elbows and legs became cyanotic, and he developed coldness and numbness of the upper limbs **(Figure 1)** . Due to the patient's symptoms and signs, anaphylactic shock was considered, and treatment with normal saline and 100 mg hydrocortisone was started. Gradually, the patient's cyanosis resolved, and he was discharged.

Anaphylactic shocks are rare, but life-threatening events may occur after receiving vaccines. Individuals may develop anaphylactic reactions within a few seconds or several hours after vaccine injection[1]. Our first case developed anaphylactic symptoms within one minute after receiving the COVID-19 vaccine, while the second one's symptoms were revealed after seven hours. Moreover, both cases had no history of previous allergic or anaphylactic reactions. Therefore, it is necessary to follow-up individuals who undergo vaccine injection during at least the first hours of vaccination.

Injection of the vaccine was performed with 2cc syringe without aspiration, and unusual bleeding was observed without any bleeding disorder. Therefore, IV administration of the vaccine may cause an early anaphylactic reaction in the first case. Recommendations vary on aspiration before vaccine injection [2]. However, this procedure is not currently recommended for COVID-19 vaccines[3].

Diagnosis of anaphylactic shock is based on the patient's clinical signs and symptoms. Prompt treatment should be initiated as soon as the anaphylactic shock is considered. Injection of IM epinephrine and IV fluids is recommended as the first-line treatment for patients with anaphylactic shock [1]. After epinephrine administration, IV hydrocortisone should be injected. However, our patients were treated with hydrocortisone as the first-line drug for the emergency treatment of anaphylaxis. An anaphylactic reaction could be life-threatening, and any delay in treatment may increase the risk of patient mortality [1]. Therefore, healthcare providers should be trained to treat anaphylactic events accurately, and required equipment should be available.

Newly-made COVID-19 vaccines are currently authorized for emergency use in many countries. Because of being novel, vaccine adverse events are not fully known [4]. Surveillance programs are necessary to monitor for complications. This challenge is notable in developing countries where infrastructure has some shortcomings. Hence, evidence for adverse events may have some drawbacks for vaccines administrated in developing countries.

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Figure 1. Cyanosis and swelling of hands 8 hours after receiving AstraZeneca Vaccine. Cyanosis may be a cardiac-related symptom of anaphylaxis.

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Ethical Consideration

After a full explanation of the letter's purpose, informed consents were obtained from the patients. Patient confidentiality was concerned during data gathering and publication.

Authors' contributions

All authors met the authorship contribution criteria based on the international committee of medical journal editors' recommendations.

Ali Safavi Naini: Conceptualization, Project administration

Seyed Amir Ahmad Safavi-Naini: Software, Data gathering, Writing - Original Draft

Zohreh Tajabadi: Writing - Original Draft, Data gathering