American College of Allergy, Asthma, and Immunology Guidance on Emergency Department Laboratory Evaluation of Allergic Reactions to mRNA COVID-19 Vaccines

Anaphylaxis to vaccines is rare with the incidence estimated at 1.31 in 1 million doses given. Multiple reports of severe allergic reactions, including anaphylaxis, to the Vaccine Adverse Event Reporting System (VAERS) have occurred since the FDA emergency use authorization of the Pfizer-BioNTech COVID-19 vaccine on Dec. 11, 2020, and the Moderna vaccine on Dec. 18, 2020. Early safety monitoring of the Pfizer-BioNTech product suggest an incidence of anaphylaxis at 11.1 cases per million vaccine doses. The CDC has released interim guidance on the assessment; diagnosis (including lab tests); and management of anaphylaxis following COVID-19 vaccination. The ACAAI Anaphylaxis Committee recommends the following guidance to Emergency Departments related to laboratory evaluation of allergic reactions to COVID-19 vaccines.

The CDC has recommended obtaining serum tryptase and Soluble Complement 5b-9 (SC5b-9) in individuals who have experienced a possible severe allergic reaction to a COVID-19 vaccine after medically stabilizing a patient. Emergency Departments can consult their healthcare facility laboratory to determine their site-specific practice for processing samples for tryptase and SC5b-9 tests. The CDC has identified the following commercial laboratories that do these tests.

Lab	Time to Obtain	Storage	Commercial Laboratories
Tryptase	**1-5 hours**	**Ambient to Frozen**	**ARUP Laboratories** **Labcorp** **Quest Diagnostics**
SC5b-9	**<2 hours**	**-70 degrees C**	**National Jewish Advanced Diagnostic Laboratories** **Quest Diagnostics**
• **The ACAAI does not endorse a specific laboratory**			

Serum Tryptase

Serum tryptase is a marker of mast cell degranulation and can be useful for confirming the diagnosis of anaphylaxis. Tryptase levels peak 60 to 90 minutes after the onset of symptoms and remain elevated for at least 5 hours. Emergency management of the patient should not be based on serum tryptase levels. While results are not rapidly available, serum tryptase levels could aid at follow-up in the diagnosis of anaphylaxis.

SC5b-9

SC5b-9 is a measurement of the terminal pathway activation in the complement system. Non-allergic hypersensitivity reactions involving the complement system activation have been proposed in PEGylated liposomes. Limited data suggest SC5b-9 is elevated rapidly after onset of a hypersensitivity reaction and remains elevated up to 2 hours or longer. Please note that once a specimen is obtained (lavender top, EDTA tube), it should be centrifuged within 30 minutes and the plasma transferred to a clean tube. SC5b-9 degrades rapidly and therefore should be frozen at -70 degrees Celsius or placed on dry ice for transport.

Laboratory Result Follow Up
Consultation with a board-certified allergist-immunologist within 1-2 weeks after a vaccination associated severe allergic reaction and prior to an additional vaccine dose is recommended. A board-certified allergist-immunologist can help healthcare providers further evaluate potential factors that might have contributed to the development of the allergic reaction and assess the appropriateness of a future COVID-19 vaccine doses in these patients.

References

CDC: Lab Tests to Collect Shortly After Severe Allergic Reaction/Anaphylaxis Following COVID-19 Vaccination

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