Anaphylactic Reaction to Chlorhexidine After Plantar Fasciitis Injection

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Introduction

The use of substances for wound disinfection dates back to ancient civilizations, however, their use was predicated more on tradition than scientific fact. Modern day antiseptic use was made possible by Louis Pasteur's research on germ theory which then inspired Joseph Lister to use carbolic acid and phenol as an antiseptic in surgical procedures.[1] Lister's pioneering work significantly reduced surgical site infections and marked the birth of modern antiseptic surgery. Afterwards we saw the development of various antiseptic solutions and techniques, including the use of iodine, hydrogen peroxide, and chlorine compounds which ultimately led to a wide range of antiseptic agents, including alcohol-based hand sanitizers, povidone-iodine, chlorhexidine, and more.

Chlorhexidine was initially developed in the 1950s by researchers at Imperial Chemical Industries (ICI) in the United Kingdom. It was quickly recognized for its effectiveness in reducing the risk of surgical site infections and other healthcare-associated infections.[2] Chloraprep, the combination of chlorhexidine gluconate and isopropyl alcohol, was developed as an antiseptic solution for skin preparation in the 1990s and eventually received approval from the U.S. Food and Drug Administration (FDA) in 2000. Since then, chlorohexidine with alcohol has become widely adopted in healthcare facilities around the world as a preoperative skin preparation solution.[2] However, despite its superior antimicrobial properties, chlorhexidine is a potentially allergenic substance. The following is a case of life-threatening anaphylactic shock due to chlorhexidine in a patient occurring after an injection.

Case

We performed a chart review and patient interview. A 48-year-old male presented to his podiatrist's clinic for a therapeutic injection into his foot to manage plantar fasciitis. The patient had no known allergies to medications or topical agents and had no history of adverse reactions during previous medical procedures. Prior to injection, chlorohexidine with alcohol was used at the injection site as part of routine preparation. A mixture containing triamcinolone, Lidocaine and Marcaine was then injected. A few minutes after the injection, the patient experienced an abrupt onset of severe symptoms, including diaphoresis, acute dyspnea, chest tightness, and altered mental status. The medical team immediately called for an emergency response, and he was subsequentially transferred to a nearby hospital where he required intubation and circulatory support with intravenous fluids, epinephrine, corticosteroids, and antihistamines resulting in the patient's stabilization. He was later discharged well.

Afterwards, the patient followed up with an allergist and had negative skin tests, negative drug challenges and undetectable specific IgE to triamcinolone, lidocaine and bupivacaine. The testing facility at New Orleans VA Medical Center was unable to test chlorohexidine specific IgE, but given the lack of response to the other drugs and no other materials used, it was deduced that chlorhexidine was the likely culprit. The patient has subsequently had injections with triamcinolone, lidocaine, and bupivacaine without issue. Chlorhexidine has been avoided.

Discussion

Anaphylactic reactions to chlorhexidine are rare, and their true incidence is unknown. The first case of anaphylaxis to chlorhexidine was reported in 1984 in Japan.[3] Although anaphylaxis is rare, allergy to chlorhexidine is relatively common as seen in areas that test for it. Allergic reactions to chlorhexidine are often preceded by milder reactions such as localized or generalized urticaria. Such incidents were not found in this patient but may have been overlooked. Undervaluation of previous chlorhexidine reactions increases the risk of a possibly fatal outcome for the patient after re-exposure in future medical-surgical procedures.[4,5]

While chlorhexidine is probably the best disinfectant available and the benefits are unquestionable, it is important to be aware of its allergenic potential and to use it only when necessary. Given the potential risk, it is imperative that healthcare providers question patients regarding allergies specifically to cleaning solutions, such as chlorhexidine, in addition to medications. It is also imperative to only use chlorhexidine only when needed to limit allergic sensitization.[5]

References

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