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CASE REPORT

Rhabdomyolysis after recombinant zoster vaccination: a rare adverse reaction

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ABSTRACT

We present a case report describing a potential rare adverse reaction of the recombinant zoster vaccination. This patient is a 60-year-old female who was admitted for severe rhabdomyolysis after receiving the vaccine. The patient's symptoms and CPK improved with aggressive hydration over several days. The patient did not have any known or reported common risk factors for rhabdomyolysis and the Naranjo Score was used to determine the likelihood of an adverse drug reaction. This is a relevant case to discuss in order to make physicians aware of a possible rare and lethal adverse effect due to a common vaccination.

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1. Introduction

Herpes zoster, or shingles, is a frequent late sequela of varicella infection causing a painful rash. To prevent this outcome, the shingles vaccination has been recommended for older adults in the USA since 2006 in the form of an attenuated vaccine. In 2017, a new recombinant vaccine was approved, even for patients who had already received the attenuated version. It is recommended for adults above 50 years and reduces the risk of shingles by about 90% [1]. The vaccine is commonly known to cause mild, rather than severe, side effects such as injection site pain and erythema, headache, and nausea [1]. Rhabdomyolysis is classified as acute muscle injury that causes a release of electrolytes, myoglobin, and enzymes such as creatine phosphokinase (CPK) into circulation. It typically presents as muscle soreness, fatigue and may lead to kidney injury. We present a rare case of a patient developing rhabdomyolysis after administration of the recombinant zoster vaccination.

2. Case presentation

This patient is a 60-year-old female with a past medical history of hypertension and thalassemia minor who was admitted to the hospital for severe rhabdomyolysis. The patient was administered a recombinant zoster vaccination in her left deltoid, did not have any immediate adverse effects, but called reporting flu-like symptoms the next day. Six days after administration, the patient presented in distress, complaining of severe myalgias in the shoulders and legs, palpitations, and dark colored urine. She denied dysuria, frequency, urgency, and was afebrile. Urinalysis revealed 3+ blood and 2+ protein. Laboratory studies showed a CPK level >23,000 (iU)/L with significantly elevated aspartate aminotransferase (AST) and alanine aminotransferase (ALT) of 1265 U/L and 747 U/L, respectively.

Thyroid stimulating hormone, Lyme disease titers, antinuclear antibody (ANA), rheumatoid factor, viral panel, blood cultures, and further immunologic workup were unremarkable. The patient denied any previous history of rhabdomyolysis, recent trauma, immobilization, statin use, toxic exposure, and new medications. The patient's symptoms, CPK, and AST/ALT improved over the next several days with aggressive hydration and she was discharged in stable condition. At one month follow up, the patient reported complete resolution of myalgias and denied any recurrence of symptoms. The second dose of the recombinant vaccine was not administered.

3. Discussion

Commonly reported adverse reactions to recombinant zoster vaccination include fever (23.6%), injection site pain (22.5%), injection site erythema (20.1%), and myalgias (12.1%) [2]. However, overt rhabdomyolysis is very rare as a search of the US (FAERS), European (Eudura Vigilance), and Canadian (Canada Vigilance) adverse event reporting systems yielded only one result reported by a physician. These findings are similar to the previous attenuated generation of the zoster vaccination which had a comparable side effect profile and one reported case of rhabdomyolysis in the FAERS database [3]. While there are numerous established etiologies for developing rhabdomyolysis, they can be generally separated into traumatic and nontraumatic causes. Traumatic etiologies are more common, of which

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crush injuries and immobilization are most frequent, accounting [4]. Sepsis, surgeries, metabolic myopathies, autoimmune disorders, and toxins are additional factors that account for the majority of remaining cases [4]. In addition, there have been limited reports of vaccine-induced rhabdomyolysis with unclear mechanisms among published cases to date, including influenza and tetanus vaccinations [5,6].

In this patient, there was no evidence of the common precipitating factors of rhabdomyolysis. While it may be difficult to definitively establish a direct relationship between a specific exposure and an adverse outcome, methods exist to determine its likelihood. For example, the Naranjo Score is a causality assessment tool which has been validated to determine the likelihood of an adverse drug reaction. Depending upon the cumulative score of 10 questions, a possible adverse reaction is classified as definite, probable, possible, or doubtful. For this patient, positive findings include the following: the adverse event appeared after the drug was given, the adverse event improved after the drug was discontinued, alternative causes were ruled out, and objective evidence of the adverse event was available. These results yield a Naranjo Score of six, characterizing rhabdomyolysis in this case as a probable adverse reaction [7].

Although the exact mechanism of this reaction is not known, we believe an exaggerated immune response to be most likely. Such a potential process has been previously described as Autoimmune/Inflammatory Syndrome Induced by Adjuvants (ASIA). This spectrum of immune-mediated diseases are believed to be caused by exposure to external factors including vaccine ingredients and can lead to inflammatory sequela such as rhabdomyolysis [8,9]. Limitations of this presentation may include that the diagnosis of rhabdomyolysis was made primarily through laboratory and clinical parameters. Given the patient's response to treatment and resolution of symptoms, a confirmatory test such as muscle biopsy was not performed. In addition, the association between rhabdomyolysis and the vaccination is largely based upon the patient's history and exclusion of other common precipitating factors such as trauma or immobilization.

Considering the possible lethal complications of rhabdomyolysis and the widespread use of the recombinant zoster vaccine, this potential serious outcome must be acknowledged and symptoms not ignored. Perhaps, patients with a recent history of risk factors such as trauma should delay in being vaccinated. At the least, patients reporting significant myalgias after administration should be tested for rhabdomyolysis.

Disclosure statement

The authors have no conflicts of interest or sources of funding to report.

Informed consent

Verbal consent was obtained from patient for publication of the case details.

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