Red Rash, Rigors and 'Rthritis – An Unusual Inflammatory Reaction to a Shingrix Vaccination

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Background

Serum sickness is a type III immune complex-mediated hypersensitivity reaction where antigen-antibody complexes are deposited in tissues triggering an inflammatory response via activation of the complement cascade. Typically serum sickness begins one to two weeks after exposure to the responsible agent. Rheumatoid arthritis is an autoimmune disease of unclear etiology, with its pathogenesis linked to a hyper-reactive innate immune system, a genetically predisposed adaptive immune system, and environmental factors. Common environmental triggers include smoking, infection, and occasionally, vaccination. This case report describes a rare presentation of both of these entities caused by the Shingrix Vaccine.

Methods

A literature review was conducted of cases of vaccination related serum sickness and rheumatoid arthritis. This particular patient's presentation, disease progression, and ultimate clinical outcomes are presented for review and discussion.

Results

The patient presented with severe bilateral symmetrical polyarthritis, myalgia, persistent fever, and diffuse rash. She was admitted and treated with a course of prednisone. Photographs of the patient and relevant investigations are presented. She had rapid improvement of her arthritis, rash, and biochemical markers. However, her inflammatory arthritis became worse on lower doses of prednisone, and she was reassessed on numerous occasions over the following months. The prolonged course was not in keeping with serum sickness, and therefore her clinical diagnosis was changed to seronegative rheumatoid arthritis. She was started on methotrexate.

Discussion

The immunogenic or adjuvant components of vaccines have the potential to induce autoimmunity through mechanisms such as molecular mimicry, epitope spreading, bystander activation and polyclonal activation. We believe that the Shingrix zoster vaccine or its components induced a pathogenic immune response through similar mechanisms in this patient, which initiated an inflammatory arthritis.

This presentation likely represents one of the first documented cases of Shingrix zoster vaccine induced seronegative rheumatoid arthritis. The lack of pre-existing symptoms prior to presentation makes it less likely that the patient had an undiagnosed inflammatory arthritis or connective tissue disease that predated her initial vaccination.

This case responded well to treatment with prednisone followed by DMARDS. Future cases could be treated similarly.