First-Infusion Rituximab-Induced Adverse Reactions in Relapsing-Remitting Multiple Sclerosis: A Case Report with Casuality Assessment

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Abstract

Rituximab is widely used in relapsing-remitting multiple sclerosis (RRMS) due to its effectiveness in B-cell depletion and disease control. However, infusion-related reactions remain a major concern, particularly during the first administration. This case report describes a 26-year-old unmarried female patient who developed chills, erythematous rash, and throat pain within 30–45 minutes of her first Rituximab infusion. Immediate management included temporary discontinuation of infusion, administration of antihistamines and supportive care. The patient recovered completely, and the infusion was successfully resumed at a slower rate without further complications. This case emphasizes the importance of early recognition, appropriate management, and continuous monitoring during monoclonal antibody therapy to ensure patient safety.

Keywords

Rituximab; RRMS; Infusion Reaction; Adverse Drug Reaction; Case Report; Pharmacovigilance

Introduction

Multiple sclerosis is a chronic immune-mediated demyelinating disorder of the central nervous system [1]. The relapsing-remitting form is the most common type, characterized by episodic neurological dysfunction [2]. B cells play a critical role in disease pathogenesis through antigen presentation and cytokine release [3]. Rituximab, an anti-CD20 monoclonal antibody, has shown effectiveness in reducing disease progression [1]. However, infusion-related reactions are frequently observed during initial administration due to cytokine release mechanisms [4]. These reactions can range from mild symptoms such as chills and rash to severe hypersensitivity reactions [5]. Proper premedication and monitoring strategies are essential to minimize risks and ensure safe therapy [6].

Case Presentation

A 26-year-old unmarried female weighing 73 kg presented with a 2-year history of RRMS. She had no history of drug allergies or comorbid conditions. Neurological examination confirmed mild disability with an EDSS score of 2.5. MRI findings revealed periventricular demyelinating plaques consistent with MS. Baseline laboratory investigations, including complete blood count, liver function tests, and renal function tests, were within normal limits [7]. The patient was previously treated with interferon beta but showed an inadequate response, leading to the decision to initiate Rituximab therapy.

Therapeutic Intervention

The patient was administered Rituximab 500 mg intravenously. Premedication included hydrocortisone, pheniramine, and paracetamol to reduce infusion-related reactions. The infusion was initiated at a controlled rate under strict monitoring. Despite premedication, the patient developed symptoms within 30–45 minutes of infusion initiation [6].

Adverse Drug Reaction and Management

The patient developed chills, erythematous rash over upper limbs, throat discomfort, and mild tachycardia. No hypotension or respiratory distress was observed. The infusion was immediately stopped, and supportive treatment including antihistamines and intravenous fluids was administered. Symptoms resolved within 30 minutes. The infusion was restarted at a slower rate and completed without recurrence of symptoms [5]. The reaction was categorized as a moderate infusion-related reaction.

Causality Assessment

Causality was assessed using WHO-UMC criteria and Naranjo algorithm. The reaction was categorized as 'probable' with a Naranjo score of 5 [8]. Severity assessment using Hartwig scale indicated a moderate level reaction. The absence of alternative causes and positive response to drug withdrawal supported the causality assessment.

Discussion

Infusion-related reactions are common with monoclonal antibodies like Rituximab, especially during first exposure [4]. These reactions are primarily mediated by cytokine release resulting from rapid B-cell lysis [3]. Studies indicate that approximately 30–40% of patients experience such reactions during initial infusion [5]. Although premedication reduces severity, it does not completely prevent reactions [6]. Compared to Rituximab, newer agents such as Ocrelizumab have lower immunogenicity but still pose a risk [2]. Early detection, temporary discontinuation, and symptomatic management are effective strategies. The involvement of pharmacists and healthcare professionals plays a critical role in monitoring and reporting adverse drug reactions [9].

Conclusion

Rituximab-induced infusion reactions are predictable and manageable with appropriate precautions. Early identification and prompt intervention are essential to prevent complications. This case highlights the importance of structured monitoring and pharmacovigilance practices. The active involvement of pharmacists and healthcare teams ensures improved patient safety and optimal therapeutic outcomes [10].

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