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Case Report: Hypersensitivity Reaction Induced by Amoxiclin/Potassium Clavulanate

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HUMAN

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ABSTRACT

The case report discusses the use of Amoxicillin/Potassium Clavulanate, a combination antibiotic, for treating bacterial infections. It emphasizes hypersensitivity reactions to the medication and the importance of monitoring and providing supportive therapy. The necessity of performing a test dose before prescribing any antibiotic to prevent adverse reactions is highlighted. The report includes a patient who experienced a hypersensitivity reaction to Amoxicillin/Potassium Clavulanate 500mg/125mg, necessitating immediate discontinuation of the medication and supportive therapy. The patient began recovering after the intervention. This report underscores the importance of vigilance in prescribing antibiotics to prevent adverse reactions.

INTRODUCTION

Amoxicillin/Potassium clavulanate is a combination antibiotic medication used for the treatment of a number of bacterial infections. [1,2,3,4] It consists of amoxicillin, a penicillin-type antibiotic, and potassium clavulanate, a beta-lactamase inhibitor. [1,2,3]Amoxicillin is a broad-spectrum β-lactam antimicrobial originally derived from penicillin. It is a bactericidal agent that targets and kills bacteria by inhibiting the biosynthesis of the peptidoglycan layer of the bacterial cell wall, which interrupts the construction of the cell wall and ultimately leads to the destruction, or lysis, of the bacteria. Clavulanic acid is a beta-lactamase inhibitor often used in conjunction with amoxicillin to broaden its spectrum and combat resistance. It has little to no antimicrobial activity of its own and instead works by preventing bacterial destruction of beta-lactams. Over the years, certain bacteria have evolved to develop resistance to standard β-lactam antimicrobials through the production of enzymes called β-lactamases. These enzymes target and hydrolyze the β-lactam ring, which is necessary for penicillin-like antimicrobials to work. Clavulanic acid prevents this degradation by binding and deactivating the β-lactamase, thus restoring the antimicrobial effects of amoxicillin. Amoxicillin-Clavulanate is largely safe and well-tolerated in the general population, with the vast majority of adverse effects being only mild gastrointestinal symptoms. According to a study conducted by Jourdan A, Sangha B et al., the prevalence of hypersensitivity to antibiotics in an inpatient setting was 8.88%, while that in outpatient setting was found to be 11.2%.

The single most common complaint is diarrhea, but others include nausea, vomiting, loose stools, and abdominal discomfort. Dermatologic effects are less common and generally related to hypersensitivity reactions. These reactions can present anywhere on the spectrum of disease, ranging from simple pruritus or urticaria to severe and life-threatening manifestations, such as anaphylaxis, Steven-Johnson syndrome, or toxic epidermal necrosis. Patients taking amoxicillin-clavulanate require monitoring at the beginning of therapy for signs of hypersensitivity and throughout the course for signs of secondary infection, such as *C. difficile* colitis or candidiasis.

The objective of the report is to highlight the importance of recognizing and managing hypersensitivity reactions to Amoxicillin/Potassium Clavulanate, emphasizing the need for test dosing and vigilant monitoring to prevent adverse reactions, as demonstrated by a patient case.

CASE REPORT

Patient Presentation:

A 53-year-old patient presented with facial swelling and rashes on the trunk after self-administering Amoxicillin/Potassium Clavulanate 625, which had been prescribed by a private practitioner for wound abscesses. Evaluation revealed papules and plaques on the abdomen and back, along with swelling of the lips and face.

Diagnostic Work-up:

The patient's symptoms were assessed, and based on the Naranjo ADR probability scale (score = 7), the reaction was categorized as a probable adverse reaction to the drug. The severity of the reaction was classified as major, specifically a hypersensitivity reaction.

Treatment:

The medication was immediately discontinued. The patient was administered Inj. Pheniramine maleate and Inj. Dexamethasone for prophylactic management of the hypersensitivity reaction. To further treat the hypersensitivity, the patient was given Bilastine 10 mg, Montelukast/Levocetirizine, and Clobetasol cream as stat medications.

Outcome:

Following the treatment, the patient's symptoms gradually improved, indicating a positive response to the intervention.

Table 1: Naranjo’s Causality Assessment score

Suspected adverse drug reaction	Naranjo’s Probability Assessment Scale
Moxypra CV (Amoxicillin and Potassium Clavulanate) 625mg PO OD	07 (Probable)
Hypersensitivity reaction such as facial swelling and rashes over the back region within 1hour of Administration.	

Figure 1: Facial puffiness

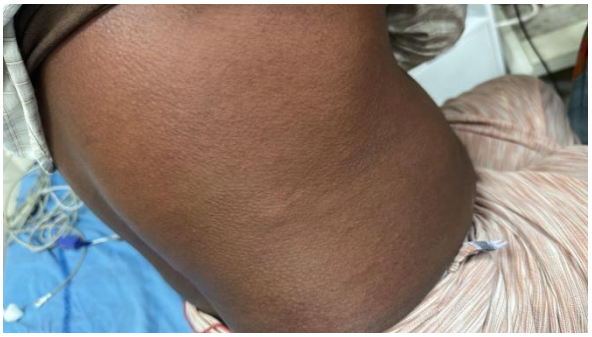

Figure 2: Rashes over trunk region

DISCUSSION

ADRs have been a source of concern due to being regarded as one of the primary causes of morbidity and mortality among hospitalized patients. According to numerous researches, ADRs are responsible for around 8% of all hospitalizations.[5]

Amoxicillin-induced rash and facial puffiness can be attributed to various underlying mechanisms, primarily involving immune-mediated responses. Amoxicillin is a beta-lactam antibiotic that can act as a hapten, forming complexes with endogenous proteins, thereby triggering an immune response. This immune reaction involves the activation of T cells and the production of antibodies, such as IgE, which leads to the release of inflammatory mediators like histamine, leukotrienes, and cytokines. The release of histamine and other inflammatory mediators induces vasodilation and increases vascular permeability, leading to erythema (redness) and edema (swelling) in the skin, manifesting as a rash. The rash is often maculopapular and may be accompanied by pruritus (itching). Similarly, histamine-induced vasodilation and increased vascular permeability can occur in the soft tissues of the face, leading to facial puffiness or edema. [6] Amoxicllin induced rash and facial puffiness can also result from a Type I hypersensitivity reaction, mediated by IgE antibodies. Upon re-exposure to the drug, these antibodies bind to mast cells and basophils, triggering the release of histamine and other inflammatory mediators. Mast cell degranulation and histamine release cause vasodilation and increased vascular permeability in the skin, resulting in characteristic rash associated with allergic reactions to the drug. Mast cell degranulation and histamine release in the soft tissues of the face can lead to facial swelling or puffiness. [7]

The presented case illuminates the occurrence of rashes and facial puffiness in the context of an individual undergoing management for wound abscess. The onset of rashes and facial puffiness followed the administration of Bilastine 10mg, Montelukast/Levocetrizine, and Clobetasol cream for plaque, maculopapular rashes and facial swelling. Of particular note is the cessation of Amoxicllin/Potassium Clavulanate during this period.

The application of the Naranjo Causality Assessment scale, attributing a "probable" relationship (score of 7) between drug administration and rashes, facial swelling development, substantiates the association with the reaction and Amoxicillin/ Potassium clavulanate.

Therapeutically, the instituted regimen, comprising Antihistamines, and corticosteroids adheres to established protocols. Diminution of the physical manifestations, with visibly healed lesions attests to the efficacy of comprehensive therapeutic approach.

CONCLUSION

Amoxicillin/Potassium Clavulanate induced facial swelling and rashes occur generally within few hours or days of taking the medication with an incidence rate of 3-7%. Dechallenge resulted in normalization of the manifestations. This drug induced hypersensitivity reaction is a serious reaction but reversible if recognised early and treated accordingly. Monitor patients prescribed Amoxicillin/Potassium Clavulanate by first documenting allergy and medical histories. For high-risk patients, administer a test dose under supervision and observe for 30 minutes. Educate patients on hypersensitivity symptoms (rash, itching, swelling, difficulty breathing) and emergency response actions. For inpatients, observe for 1-2 hours after the first dose and conduct daily checks for delayed reactions. Outpatients should have a follow-up within 48-72 hours. Advise daily self-checks for symptoms. If treatment is prolonged or the patient has liver conditions, monitor liver function tests periodically. The report concludes that performing test dose before prescribing any antibiotic is necessary to prevent adverse reactions.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVAITIONS

ADR - Adverse Drug Reaction

CV - Potassium Clavulanate

OD - omne in die (once daily)

PO - per oral

Tab - Tablet

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