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Case Report

A Case Report on Ofloxacin Induced Maculopapular Rash

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ABSTRACT

To report a case of maculopapular rashes secondary to the use of ofloxacin. A 23-year-old female was presented with maculopapular rashes throughout the body along with a reddish eye. The causality of the Adverse Drug Reaction (ADR) was assessed using the WHO UMC causality scale, and ADR was found to be probable. Ofloxacin was withdrawn and the patient was conservatively managed. By monitoring this occurrence, we were able to determine the correlation between ofloxacin and maculopapular rash. It was discovered that prompt offending agent withdrawal and supportive medication were beneficial.

Keywords: Case report, Adverse drug reaction, Ofloxacin, Maculopapular rash, WHO UMC Causality scale.

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INTRODUCTION

Ofloxacin, belonging to the fluoroquinolone class of antimicrobial agents, is a potent drug widely utilized for the treatment of a variety of bacterial infections.[1] As a representative of second-generation fluoroquinolones, it exhibits a broad-spectrum bactericidal effect.[1] Its mechanism of action involves binding to bacterial enzymes, specifically topoisomerase II (DNA gyrase) and topoisomerase IV, both pivotal for DNA-related processes like replication and repair.[1] By inhibiting these enzymes, ofloxacin disrupts essential cellular functions, impeding bacterial DNA replication, transcription, and repair and ultimately preventing cell division.[1] Additionally, the antibiotic's ability to concentrate intracellularly enhances its rapid bactericidal action.[1] Prudent use of ofloxacin is crucial, adhering to prescribed dosages and durations, to mitigate the risk of antibiotic resistance and potential adverse effects.[1] Ofloxacin, when administered orally, undergoes rapid and efficient absorption from the gastrointestinal tract, achieving nearly complete oral bioavailability in healthy, fasting adults.[2] Generally, fluoroquinolones are well-tolerated, and most side effects associated with their use are mild to moderate in nature.[3] However, there are instances where serious adverse effects may occur.[3] The common, more frequently observed side effects encompass gastrointestinal symptoms such as nausea, vomiting, and diarrhea.[3] Additionally, individuals may experience headaches and insomnia as part of the medication's side-effect profile.[3]

Maculopapular exanthema is characterized by a sudden and widespread outbreak of red macules and papules without accompanying scaling.[4] This presentation is commonly encountered in routine clinical settings, and differentiating between its primary causes, particularly viral and drug-induced origins, can be challenging. Among the various manifestations of non-immediate allergic reactions to drugs, maculopapular exanthema stands out as the most prevalent.[5] Studies indicate a significant involvement of T helper 1 (Th1) cytokines and CD4 (+) T cells in the pathogenesis of this reaction.[5] Numerous medications, including antibiotics like beta-lactams and sulphonamides, anti-convulsants, and non-steroidal anti-inflammatory drugs, have been identified as potential triggers.[4]

The onset of the cutaneous eruption typically occurs within 7 to 10 days after initiating treatment, with a range extending from 5 to 21 days.[4] The rash typically initiates on the trunk and proximal extremities.[4] Distinguishing features of a drug-induced exanthema encompass the presence of itching, merging of the rash in dependent areas, involvement of the face, and the occurrence of purplish lesions on the lower extremities.[4]

Hypersensitivity reactions to quinolones are infrequent, with reported frequencies ranging from 0.4% to 2%.[6-8] These reactions encompass a range of symptoms, including erythema, itching, urticaria, skin rashes, and, in more severe cases, shock.[7] The precise patho-mechanism underlying these reactions has not been fully elucidated.[8] Some observations suggest potential pseudo-allergic mechanisms, such as direct histamine release from skin mast cells, notably without a corresponding release from peripheral basophils.[8] The immediate onset of symptoms upon initial exposure to the drug further supports this hypothesis.

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Table 1: World Health Organization and Uppsala Monitoring Center (WHO-UMC) system for standardized case causality assessment.

Causality Category	Assessment criteria
Probable	Adverse drug reactions and ofloxacin intake are correlated over the course of time.
	The rash did not reappear even after continuing Cetirizine, and the dermatologist ruled out viral exanthem.
	Rash disappeared after the ofloxacin was stopped.
	Re-challenge with ofloxacin is not required.[9]

Conversely, the relatively low incidence of adverse reactions, combined with indications of sensitization in patients with prior exposure to quinolones, hints at a potential allergic response.[8] This suggests that in at least some cases, there may be a sensitization process following earlier exposure to quinolones, leading to an allergic reaction upon subsequent contact with the drug.[8] The complex interplay of these factors makes the understanding of quinolone hypersensitivity reactions an ongoing area of research.

Our case report focuses on a maculopapular rash induced by oral administration of ofloxacin, given its rarity. Identifying the etiology holds substantial importance for the patient, particularly in drug-induced diseases where the withdrawal of the offending agent significantly influences the patient's prognosis.

CASE SUMMARY

Informed consent from the patient was obtained for the examination and taking the photographs.

Day 1

A 23-year-old female presented with a sore throat and cough and was prescribed Ofloxacin and Cetirizine. The patient had finished a three-day course of azithromycin a week prior for throat infection.

Day 2-5

These rashes initially appeared on the second day after taking Ofloxacin, starting on the face and later spreading throughout the body on the third day with redness in the eyes. Notably, the lips, palms, soles of the feet, and mouth remained free of rashes. The patient's systemic examination revealed a blood pressure of 110/70 mmHg, a pulse rate of 86 beats/min, a respiratory rate of 20 breaths/min, and a temperature of 104° F. Elevated ESR was found in the laboratory reports, while other parameters were found to be normal. Ofloxacin was discontinued after the fifth dose on the third day, and cetirizine was continued. The patient was determined to have experienced a hypersensitive reaction

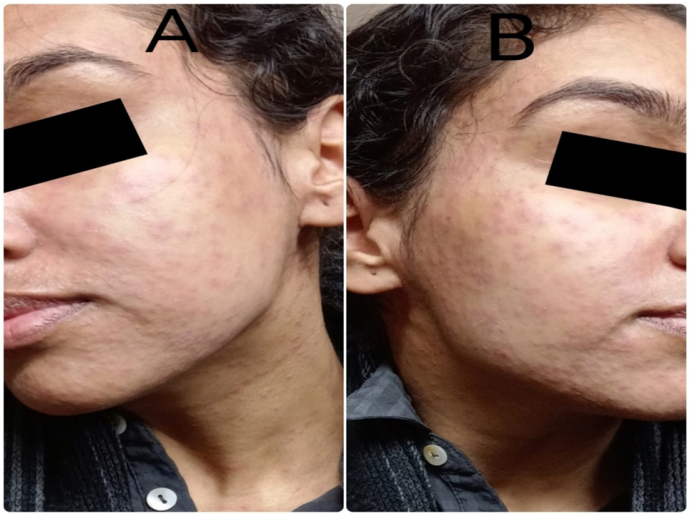

Figure 1 : (A) and (B) patient with characteristic maculopapular rash present over the face and neck.

to Ofloxacin. Following an outpatient consultation, the patient was instructed to maintain their use of Cetirizine and was also advised to include Vitamin C, paracetamol, and calamine lotion in their treatment (Figure 1).

Day 10

All over the body, the rashes became less intense. The scars remained on the face after the bumps disappeared. The eyes' reddish tint subsided. The patient's systemic examination revealed normal results.

Day 20

The patient underwent a comprehensive recovery, completely restoring their prior state of health and well-being.

DISCUSSION

The maculopapular eruption is a cutaneous adverse medication reaction that occurs often. Macules, which are separate flat patches, and papules, which are elevated lesions, make up maculopapular rashes. The skin may feel hot, burning, or itchy, and the rash is typically bright red in color. Even though the face is frequently spared, the entire skin surface may be affected.[5] In a documented case report, an adult patient encountered an adverse event, presenting with the emergence of a mucocutaneous maculopapular rash subsequent to the oral administration of Ofloxacin.[10]

Fluoroquinolones (FQs) are indeed recognized as broad-spectrum antibiotics (active against Gram-negative and Gram-positive bacteria) utilized in treating various infections. They're often well-tolerated by most individuals.[11] Its commonly reported side effects include fever, acute renal failure, agranulocytosis, and other dermatological reactions,[12] with adverse effects prompting the discontinuation of treatment in fewer than five percent of cases.[11] Ofloxacin is a second generation of fluoroquinolone. It

can be applied topically, intravenously, or orally. Due to their minimal side effects and broad spectrum antimicrobial coverage (which includes anti-tubercular action), they are among the most frequently prescribed and used antibiotics.[13] It is often used for acute gastroenteritis, respiratory infections, and urinary tract infections.[14]

Among the widely used fluoroquinolones, Ofloxacin showed a significantly higher incidence of Cutaneous Drug Reactions (CDRs) at 33.3% in a systematic comparative study. This incidence was significantly higher than that of Levofloxacin.[15] One prevalent Adverse Drug Reaction (ADR) seen in an ofloxacin exploratory trial was generalized maculopapular skin rash. There have been reports of Steven Johnson Syndrome, Toxic Epidermal Necrosis[10,16] and hypersensitivity reaction[3] linked to the administration of ofloxacin. Patients on ciprofloxacin or levofloxacin also experienced maculopapular rashes.[17,18]

In a case report authored by Ramani YR *et al.*,[12] three pediatric patients exhibited maculopapular rashes accompanied by generalized pruritus following the administration of oral Ofloxacin therapy. Notably, the manifestation abated upon discontinuation of the medication.

The 39-year-old male presented a severe hypersensitive reaction to Ofloxacin infusion, marked by a pale rash and redness at the injection site.[19] and an erythema multiforme-like rash manifested in a 27-year-old male patient undergoing treatment with oral Ofloxacin for a urinary tract infection, providing compelling support for our case report.[20]

In our instance, the patient started to experience facial redness on the second day after taking ofloxacin, and by the third day, the rash had spread across the body. The patient first presented with a sore throat and cough three days prior, at which point doctors prescribed Ofloxacin and Cetirizine. On the 3rd day, after the 5th dose, ofloxacin was stopped and cetirizine was kept up. It was found that the patient had reacted hypersensitively to ofloxacin. According to the WHO-UMC causality assessment system, the medication and ADR had a "probable" causative link (Table 1).

Withdrawing the suspected medication and treating any symptoms were necessary for the management of such reactions. In this study, the suspected medication was withdrawn as soon as the adverse drug reaction occurred, and antihistamines were then administered to treat the accompanying itching. The patient reacted well to these measures.

The patient was advised to continue taking Cetirizine and to incorporate vitamin C, paracetamol, and calamine lotion into their treatment regimen during an outpatient appointment. Maculopapular erythematous rashes and other symptoms are subsiding as the patient responds favorably.

The patient, in a gracious gesture, provided consent for the acquisition and publication of photographs, with a steadfast commitment to upholding their privacy and confidentiality.

While Ofloxacin is widely regarded as a safe and extensively utilized drug, it's crucial to acknowledge the potential occurrence of maculopapular rash or hypersensitivity reactions associated with its use. This case report holds significant importance in shedding light on these rare yet noteworthy outcomes.

CONCLUSION

In this specific case, an association between ofloxacin and the occurrence of maculopapular rashes was observed. While severe reactions to ofloxacin are not uncommon, early identification of symptoms and prompt cessation of the medication, followed by supportive therapy, proved effective. This increased focus on ofloxacin's adverse effects can enhance clinicians' ability to accurately recognize and manage cutaneous reactions in patients, ultimately aiding in future therapeutic decision-making.

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CONFLICT OF INTEREST

The authors declare no conflict of interest pertaining to this research.

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