Severe Systemic Allergic Reaction after Topical Application of Mupirocin

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Abstract

Mupirocin (MUP) is a natural derivative of crotonic acid extracted from Pseudomonas fluorescens. This antibiotic has a unique chemical structure and mechanism of action.

It is often used topically for the treatment of cutaneous infections to prevent skin and soft tissue infections caused by S. aureus isolates and where the MRSA isolates are epidemic. Furthermore, MUP may be used as a choice drug for nasal decolonization.

Despite some side effects, mupiro¬cin has been reported to be safe and to cause allergic reactions in only extremely rare cases. This paper is a report on a rare case of severe systemic allergic reaction resulting from treatment with mupirocin ointment in a 39 year old male patient who had a history of burn injury.

Keywords: Anaphylaxis, medmupirocin, mupirocin, skin reactions

Mupirocin (MUP) as a promising drug against gram-positive bacteria was introduced by Sutherland *et al.*[1] Subsequently, it was approved for the treatment of cutaneous staphylococcal and streptococcal infections.[2]

Although MUP is known to cause allergies only in extremely rare cases, it has been documented to be safe and well tolerated with a safety profile that includes mild-burning sensations and pain.

To date, a small number of cases of MUP-induced contact allergic dermatitis have been noted, but none of them were systemic reactions.[2-5] We report for the first time a rare case of severe systemic allergic contact dermatitis resulting from topical treatment with MUP ointment from India.

Case Report

A 39-year-old male patient who had a history of burn injury by bullet motorbike silencer visited the hospital for the management. He is a known case of hypertension and his medication blood pressure was under control. There was no otherwise any significant medical history. Hospital admission was uneventful and managed successfully with intravenous (IV) antibiotics and further dressings with topical ointments under aseptic precautions. He was discharged after initial management in the hospital and advised to visit the hospital for follow-up clean and dressing.

On his routine follow-up visits, the same procedure for dressing with MUP was repeated. Within a fraction of minutes, he started to develop pruritus and rashes. This was considered to be mild skin allergic reactions to the ointment which was thought to subside on its own. But later he developed breathlessness, palpitations with flushing, and redness all over the body. He was taken to ER where his vitals were found to be 90/60 mm Hg, 110 / min pulse rate. Immediately IV line secured, and injections Hydrocortisone 100 mg and Avil stat were given. 0.5 cc

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diluted inj Adrenaline was given subcutaneously. After 15–20 min the patient was settled and shifted to the recovery room. His blood test was performed to check for complete blood count (CBC) and immunoglobulin E (IgE) profile, which was found to be within normal limits. Later he was discharged on tab montelukast + levocetirizine combination for 3 days.

Discussion

Worldwide MUP is topically used to treat or prevent staphylococcal and streptococcal infections. It reversibly binds to bacterial isoleucyl-transfer RNA synthetase resulting in suppression of bacterial protein and RNA production in cutaneous infectious lesions.[6]

MUP is effective for treating most cases of cutaneous infection. Hence, it has been used in a variety of wounds especially for treating both primary and secondary superficial skin infections caused by *Staphylococcus aureus* isolates (such as furuncle, impetigo, surgical wounds). It has shown improvement in 80% infected patients and 90% eradication in the *S. aureus* isolates.[7]

To add further, MUP ointment which is applied to wounds not only to prevent cutaneous infections that are associated with cutaneous defects but also it provides a moist, sterile environment that is required for optimum healing

The most commonly reported side effect in the majority of cases, after local application of MUP ointment, is cutaneous symptoms comprising temporary burning sensation or pain, which is in less than 3% of patients.[8]

With only rare reports of contact allergic reaction to MUP, there were no known cases of systemic side effects that were severe enough to evoke anaphylaxis or diarrhea reported from India.

In our case, as the right thigh wound was caused by silencer burn of bullet motorcycle, we expected only about local reactions in follow-up visits and that to be limited in the initial wound area. However, in follow-up visits for dressing with MUP ointment to the wound the cutaneous and systemic symptoms were aggravated. Clinical symptoms were combination of skin rash, pruritus, breathlessness, hypotension, and palpitations. Initially, these intensified local symptoms were regarded as a manifestation of the local allergic reaction to MUP, but later on systemic features appeared.

As described earlier, very rare incidences of MUP contact allergic dermatitis or reaction have been reported, and no case of severe allergic reaction to MUP has been described. Because such cases are largely unheard-of, surgeons or physicians might be uninformed of causal relationship between MUP and allergic reactions that can startle health-care physicians when they encounter such a case.

We hope our report will raise awareness of this rare situation and enable proper decision-making to prevent exacerbation of adverse drug reactions or spread of the wound.

In conclusion, an allergic reaction resulting from MUP ointment is rarely reported. When a surgeon or physician encounters a situation similar to this rare case, hopefully our report will help them make correct diagnoses and decisions to prevent the wound from worsening or spreading.

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Conflicts of interest

There are no conflicts of interest.

References

1. Sutherland R. Pseudomonic acid: An antibiotic produced by pseudomonas fluorescens. Proceedings of the 16th Interscience Conference on Antimicrobial Agents and Chemotherapy, 1976.
2. Assier H, Hirsch G, Wolkenstein P, Chosidow O. Severe contact allergy to mupirocin in a polysensitized patient. Contact Dermatitis 2019;80:391-3.
3. Zhang AJ, Warshaw EM. Allergic contact dermatitis caused by mupirocin and pimecrolimus. Contact Dermatitis 2019;80:132-3.
4. Zappi EG, Brancaccio RR. Allergic contact dermatitis from mupirocin ointment. J Am Acad Dermatol 1997;36:266.
5. Seo D-H, Shin JY, Roh S-G, Chang SC, Lee N-H. Unexpected spreading of severe allergic reaction to mupirocin ointment around a chemical burn wound: A rare case report. J Wound Manage Res 2020;16:170-2.
6. Thomas CM, Hothersall J, Willis CL, Simpson TJ. Resistance to and synthesis of the antibiotic mupirocin. Nat Rev Microbiol 2010;8:281-9.
7. Dutta P, Das S. Mammalian antimicrobial peptides: Promising therapeutic targets against infection and chronic inflammation. Curr Top Med Chem 2016;16:99-129.
8. Ward A, Campoli-Richards DM. Mupirocin: A review of its antibacterial activity, pharmacokinetic properties and therapeutic use. Drugs 1986;32:425-44.