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CASE REPORT

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Systemic toxicity to betamethasone ointment

Rahim Aliyev[1] | **Josef Finsterer**[2]

[1]Department of Neurology and Clinical Neurophysiology, Azerbaijan State Advanced Training Institute for Doctors named after A. Aliyev, Baku, Azerbaijan

[2]Krankenanstalt Rudolfstiftung, Messerli Institute, Vienna, Austria

Correspondence
Josef Finsterer, Krankenanstalt Rudolfstiftung, Messerli Institute, Postfach 20, 1180 Vienna, Austria.
Email: fifigs1@yahoo.de

Abstract

Topically applied betamethasone for actinic keratosis may trigger systemic side effects. Systemic side effects of topical betamethasone may completely resolve after discontinuation of the causative agent. A 59-year-old male patient with scalp actinic keratosis developed fatigue and the need to sleep shortly after starting topical betamethasone/diclofenac ointment. Additionally, he experienced vertigo, nausea, sleep disturbance, change in character and recognition, tiredness, visual impairment, and elevated blood pressure. Since all symptoms resolved completely within 48 hours after discontinuation of the ointment, they were attributed to glucocorticoids.

1 | INTRODUCTION

Although systemic side effects of systemically applied glucocorticoids are well appreciated, systemic side effects of topical steroids have been only rarely reported.[1-3] Here, we present a patient who experienced systemic side effects after topical betamethasone.

2 | CASE REPORT

A 59-year-old Caucasian male patient presented to the dermatologist with an approximately 10-year history of slightly itching, scaly, hyperkeratotic eczema on the scalp. His previous history was otherwise uneventful. The only other therapy he had tried was an antifungal shampoo years before that was not successful. The dermatologist diagnosed actinic keratosis and attributed it to advanced age or extensive sun exposure because of baldness. The lesion was treated with acetoacetic acid in the dermatologist's office, and the patient was asked to start 1 week later with two different ointments, one in the morning and one at night. One day after consulting the dermatologist, the patient developed a mild, presumably viral infection. Since leukocytes and C-reactive protein were only slightly elevated, he refused to start any therapy and the infection resolved without treatment within 5 days.

One week after the visit to the dermatologist, the patient started, as recommended, with betamethasone-dipropionate ointment at night and diclofenac gel in the morning. Shortly after starting the treatment, the patient recognized a general feeling of cold and tiredness. These feelings did not completely resolve despite avoiding exposure to cold, as well as getting rest, staying warm, and taking vitamins. He experienced cold feet despite warm clothes and shoes. He had an increased need for rest and sleep. Approximately 2 weeks later, after 3.5 hours of strenuous outdoor activity in the cold during the day, the patient experienced positional vertigo and nausea, particularly in the dark and when lying in bed. During the night, he had a hard time sleeping. The next morning, he felt better but was still tired despite having slept for approximately 8 hours. He noticed that he recognized his environment in a different, unusual way—like never before. Nonetheless, he continued the dermatological therapy. After another strenuous outdoor activity 1 day later, he again experienced vertigo, nausea, tiredness, and an enhanced need to sleep. Despite sleeping intermittently for 8 hours, he felt tired in the morning and attributed it to noncontinuous sleep; he

suspected symptoms of a "burn-out syndrome." He noticed blurred vision, particularly on the right eye, and was unable to read the small letters in the newspaper. On the third day of this change in personality and perception, his blood pressure was 150/95 mm Hg. During 1.5 hours of physical activity, he recognized gastric pain and a trace of vertigo, but the symptoms lessened as the day proceeded.

At this point, the patient suspected for the first time that the local dermatological therapy with the steroid might be responsible for his change in personality and recognition and the other symptoms. Thus, he discontinued the dermatological treatment himself. That night, his nausea and vertigo markedly regressed and sleep quality markedly improved. Within another 48 hours, all other symptoms completely disappeared, and he became the same person with the same psychological and physical abilities as before.

3 | DISCUSSION

This case shows that betamethasone, topically given on the skin as an ointment, may cause systemic side effects as described above. Such side effects to betamethasone ointment have not been previously reported, although it is known that betamethasone, given as an ointment, can penetrate the skin.[4] Notably, there are reports about delayed hypersensitivity reactions to topically applied corticosteroids.[2] A generalized exanthematous reaction with pustulosis induced by topical corticosteroids has been reported.[1] There is also one report about a fatality due to pulmonary edema after betamethasone and β-mimetics.[5] Furthermore, a patient with schizophrenia was liberally treated with the potent topical corticosteroid clobetasol for morphea and subsequently experienced an exacerbation of active phase symptoms of schizophrenia.[3] After reduction of clobetasol, these active phase symptoms dissipated.[3] One report recounted that topical corticosteroids on the skin can increase intraocular pressure.[6] In a 6-week-old male infant, application of topical betamethasone after bilateral phacoaspiration resulted in increased intraocular pressure and body weight gain, with development of a cushingoid habitus 6-8 weeks after initiation of topical steroids.[7]

The reason why the betamethasone ointment caused such severe side effects remains elusive. We speculate that due to the previous, mild infectious disease, resorption of the compound via the skin was increased, and this phenomenon led to increased serum levels of the drug and the subsequent systemic side effects. Furthermore, scratching effects might have made the skin more vulnerable and permeable to the glucocorticoid. A copathogenic factor could be chronic stress, which might have impaired the immune system and thus favored the abnormal reaction. Another factor could be presumed chronic gastritis, which might have favored the admission of pathogenic viruses, thus contributing to the abnormal reaction. However, the patient was immunocompetent, and there were no clinical indications for an acute infection during the dermatological treatment. The strongest argument for a causative role of betamethasone, however, is that the adverse effects resolved completely with discontinuation of the drug. Diclofenac was excluded as being causative because the patient had used it previously in higher dosages for minor sport injuries without any side effect. Diclofenac is a cyclooxygenase 1 (COX1) and COX2 inhibitor, and thus, no proinflammatory prostaglandins are released. It also has an antipyretic and analgesic effect.

In conclusion, this case shows that topically applied betamethasone in a patient with vulnerable skin, a previous history of a mild, transient viral infection and chronic stress may trigger severe, systemic side effects that completely resolve with immediate discontinuation of the agent.

CONFLICT OF INTEREST

There are no conflicts of interest.

AUTHOR CONTRIBUTION

RA: involved in literature search, discussion, and critical comments. JF: involved in design, literature search, discussion, first draft, and critical comments.

INFORMED CONSENT

The study was approved by the institutional review board.

ORCID

Josef Finsterer https://orcid.org/0000-0003-2839-7305

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