

Mannitol Cream for Itchy Psoriasis, a Case Report

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ABSTRACT

78-year-old woman with severely itchy psoriasis, bald from scratching her scalp and pulling out her hair found relief from the itch within five minutes of applying a 30% mannitol cream. After using the cream twice daily for 5 weeks, her scalp psoriasis had subsided and her hair had regrown. The effect of this cream on her lower back psoriasis is documented with photographs. The psoriasis recurred when the cream was no longer available.

Keywords

Itch, Psoriasis, Inflammation.

Case Report

P., a 78-year-old woman, was first seen on June 18, 2014 with left shoulder pain. Because her scalp was so itchy from psoriasis, she had to keep scratching it, which strained her shoulder. Her daughter said she could tell where she had been around the house by the trail of skin flakes she left behind from scratching.

On examination, she walked into the office scratching her almost hairless head, which was covered in psoriasis and scabs where she had scratched to the blood. She was tender to palpation of the left axillary nerve and the insertions of the left deltoid muscle on her acromion and her humerus indicating a left deltoid tendinopathy which had caused an axillary neuropathy.

To relieve her neuropathic pain, the left axillary nerve was treated with nerve blocks. A total of 12 mL of 3% glycerin, 4% dextrose, and .1% lidocaine were injected perineurally around the axillary nerve. This removed her shoulder pain, but she was still scratching vigorously.

This is a photograph of P.'s left ear December 16, 2014. She had been without topical mannitol for two months and her psoriasis had recurred. When she was first seen there was almost no hair on her head, but as she had been referred for shoulder pain relief, photographs were not taken at her first visit.



Figure 1:

At the time, I had discovered that perineural injections of 5% mannitol produced almost instant pain relief in the areas supplied by affected nerves. To find out if mannitol could provide topical pain relief, pharmacist Marylene Kyriazis had concocted a 30% mannitol containing base cream I was trying on my pain patients. I gave the cream to P. who rubbed it on her head. Two minutes later, she had stopped scratching. She smiled and said: "this is the first time in 15 years that I have not been itching!" She went home with a supply of cream.

On June 26, P.'s scalp psoriasis was much better. She stated while her previous medications only gave her a few minutes respite from the terrible itch she was suffering from, she now got 4 to 6 hours

of relief. As she had not scratched her head, her left shoulder was no longer painful. On examination, she had no evidence of plaque psoriasis on her scalp, only small areas above her ears still had a thin silvery crust on them. I supplied her with more mannitol cream.

By August 1 P. no longer had any trace of psoriasis on her head: the thick scaly crust which had covered her scalp had been replaced with healthy blonde hair. Below is a video of P. taken after using the cream on her scalp for 5 weeks.

<https://youtu.be/feU10iG0hmA>

Video of P. Taken after using the 30% mannitol cream BID on her scalp for 5 weeks.

She wanted to try the 30% mannitol cream on psoriasis elsewhere on her body. Because the cream was experimental, I could only give her small amounts which she saved for her scalp. I supplied her with a further 100 mL and photographed the large psoriatic plaque she had on her lower back.

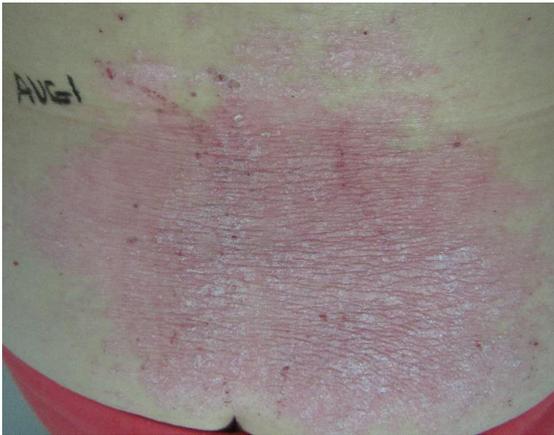


Figure 2: August 1 photograph of psoriatic plaque on P's lower back of 15 years duration, in spite of regular use of phototherapy.

P. came back on August 5 stating the plaque was less itchy and felt smoother. On examination, the plaque was red but had far fewer silvery scales. The areas of plaque on the side and top of her scalp had disappeared, but she still had plaque on the back of her scalp, which she has not treated because of the scarcity of the cream.



Figure 3: Photograph of P's lower back taken on August 5, 5 days after starting use of 30% mannitol cream.

By August 14, P.'s low back psoriasis, was now under control. She applied the cream at bedtime and was no longer woken up with itch, but she was itching in the morning when she woke up, so she reapplied the cream and the protection from itch lasted all day. On average, her itch resolved in 5 min. after cream application, and the duration of relief averaged 10 hours. Photographs of her backside showed the crusts and excoriation had disappeared.



Figure 4: Photograph of P's lower back taken on August 14, 14 days after starting use of 30% mannitol cream.

The hair on her scalp looked healthy and she was delighted at no longer being in a state of constant itching. She said: "my scalp used to feel as if it was invaded by an army of ants which were crawling all over and were coupled with lice. The itch was unbearable."

Unfortunately, by then Dr. Kyriazis had run out of the necessary materials, mannitol and base cream, to make more cream so from then on only a small amount could be given to P.

When she came back on August 18, P. was only using the cream on her psoriasis area once a day at bedtime. She woke up very itchy, and only applied the cream after she had a shower. Before her shower she scratched vigorously.

On examination, she still had a great deal of redness in the psoriasis area in her buttock. Her hair and her scalp looked entirely normal. I told her to avoid scratching: any trauma to the skin would worsen her psoriasis. I instructed her to use ice or the cream though this meant she would have to use it more than twice a day.

When she returned on September 15 P. had been using the cream on her scalp only, as she was running out and did not want her scalp psoriasis to recur. This meant that the area of psoriasis on her buttocks had not been treated in two weeks, and, as a result, psoriasis had returned, despite her use of phototherapy. On examination, there was only a small area of psoriasis at the back of her scalp, and she had a nice head of blonde hair, with no crust. On her back, the scaly psoriasis has returned.



Figure 5: Photograph of P's lower back taken after not using the 30% mannitol cream for 3 weeks.



Figure 6: P. was seen on December 16: She has not had any of the mannitol cream for her psoriasis for 2 months, and, as a result, her scalp psoriasis had recurred.

On examination, she had psoriasis on her scalp, her buttocks, and her legs though she had been receiving light therapy.

Discussion

Hereditry, environmental factors and the immune system are involved in generating psoriasis [1-3]. There is also increasing evidence that activation of the transient receptor potential vanilloid one (TRPV1), pain and itch receptor is implicated in causing psoriatic dermatitis. Mice treated with topical imiquimod develop psoriatic like skin lesions. When their TRPV1 receptors are absent or blocked, the skin lesions are much less evident following imiquimod applications [4]. P's severe itch was also likely to have been related to TRPV1 receptor activation [5]. TRPV1 receptors are present on C fibers, small unmyelinated neurons which abound in the skin. They are sodium and calcium channels which, when open, cause the nerve to depolarize and send pain and/or itch signals to the brain. They also release substance P and calcitonin gene-related peptide (CGRP), which together, cause vasodilatation and fluid extravasation [6-8]. More importantly, TRPV1 receptors are surrounded with dendritic cells which are associated with the infiltration of CD45⁺ leukocytes, mast cells as well as CD3⁺ T cells. TRPV1 receptors have an important role to play in generating inflammation and tissue proliferation, [2] central to defence against infection or injury and to the repair mechanism. Unfortunately, they are also associated with the release of interleukin 23 (IL-23) which is

directly associated with the appearance of psoriatic lesions [3,9]. Why would a cream containing mannitol provide relief for the itch and the inflammation associated with psoriasis?

Topical mannitol was shown to be a TRPV1 inhibitor, as it stopped the pain signals caused by topical capsaicin, a selective TRPV1 receptor agonist [10,11]. This may explain why P. had a good response to it. Mannitol is a plant derived sugar alcohol used as a sweetener in the food industry and intravenously to treat cerebral edema and renal failure [11]. Except for diarrhea when it is ingested to excess, it has no serious side effects. Currently, the only mannitol containing cream on the market also contains 1.25% menthol [12]. Patients who are plagued with severe itching often scratch themselves until they bleed. If menthol is applied to an open wound, it causes a brief burning sensation, but it also accelerates healing [13]. The cream P. received to relieve her psoriatic itch, contained only mannitol, thus avoiding this side effect of menthol, but the healing of her excoriations may have been slower than if menthol had been included.

A randomized, placebo-controlled study to assess topical mannitol's effect on itchy psoriasis is needed to evaluate its potential therapeutic implication. The author would be glad to contribute the materials needed for such a study.

Conclusion

It is likely that mannitol relieved this patient's itchy psoriasis through down regulating her affected TRPV1 receptors. Topical mannitol's ability to relieve the symptoms and signs of psoriasis needs further study.

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Marylene Kyriazis, Pharm.D. Compounded the mannitol cream and, subsequently, randomized and distributed the cream in the research project cited in reference 10.

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