CASE IN POINT

Successful Treatment of Tinea Versicolor With Salicylic Acid 30% Peel

Samantha S. Swerdlick, BS[a]; Kathleen R. Krivda, MD[b]; J. Austin Cox, MD[b]

Background: Tinea versicolor is a common superficial fungal infection caused by *Malassezia* species. It typically affects the trunk and proximal upper extremities and is treated with topical or oral antifungal medications. Treatment may be limited by patient preference or logistical constraints, especially in cases of extensive cutaneous involvement, where topical application may be challenging.
Case Presentation: An 18-year-old active duty female with extensive tinea versicolor, likely precipitated by military training in hot and humid conditions, presented to the dermatology clinic. Given the patient's inability to consistently apply topical treatments during military activities and the limited efficacy of oral antifungals, the patient underwent in-office treatment with a salicylic acid 30% peel. Two peels were administered 10 days apart. At 3 weeks posttreatment the arm lesions were no longer evident and there was significant improvement of the lesions on her back. Incidental improvement in acne vulgaris was also noted.
Conclusions: This case highlights the potential use of a salicylic acid 30% peel as an effective in-office treatment for tinea versicolor, particularly in patients who face challenges with topical medication adherence. The peel also offers additional benefits for patients with concomitant acne.

Author affiliations can be found at the end of this article.
Correspondence: Kathleen Krivda (kathleen.r.krivda.mil@health.mil)

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Tinea versicolor (TV) is a common, chronic, and recurrent superficial fungal infection caused by *Malassezia* species, most commonly *Malassezia furfur* (*M. furfur*)—a dimorphic fungus that is a part of the normal skin flora and resides in the stratum corneum.[1] TV manifests as hypopigmented, hyperpigmented, or erythematous macules and patches with scaling, typically found on the trunk and proximal upper extremities. The condition is most common among young to middle-aged individuals exposed to high temperatures and humidity.[1]

While many cases respond to topical antifungal treatment, application can be cumbersome, particularly in large areas that are difficult to reach. An efficient and cost-effective in-office treatment option could alleviate patient burden and improve satisfaction. This article presents a case of TV successfully treated with an in-office salicylic acid (SA) 30% peel, an uncommon application of this medication.

CASE PRESENTATION

An 18-year-old female active-duty US Army service member with a history of acne vulgaris presented to a dermatology clinic with a mildly pruritic rash that had been present for several weeks. An examination revealed hyperpigmented macules and patches with overlying fine scales across the patient's back and bilateral arms (Figures 1 and 2). She reported no history of similar lesions. The patient had recently completed a military basic training course during which she wore a uniform jacket and trousers daily in hot and humid conditions. A skin scraping was obtained. Microscopic examination with potassium hydroxide preparation revealed hyphae and spores, consistent with TV.

The diagnosis of TV and treatment options (topical ketoconazole 2% shampoo, topical terbinafine, or oral fluconazole) were discussed with the patient. Due to military training-related constraints, residence in the barracks, and personal preference, the patient felt unable to regularly apply topical medications to the entirety of the affected area and preferred to avoid oral medication. The decision was made to pursue in-clinic treatment with a SA 30% peel. The affected areas (back and bilateral arms) were thoroughly cleansed and prepped with alcohol. SA 30% in hydroethanolic solution was applied evenly to the affected area. The patient was observed for pseudofrosting, a precipitation of SA crystals that indicates peel completion (Figure 3). The peel was left in place, as it is self-neutralizing, and the patient was instructed to shower that same day with a gentle cleanser. This procedure was repeated 10 days later. Both treatments were well tolerated, with only a transient burning sensation reported during the application. At 3-week follow-up, the patient presented with complete resolution of her arm lesions and significant improvement of the back lesions (Figures 4 and 5). She also reported improvement in the acne vulgaris on her back.

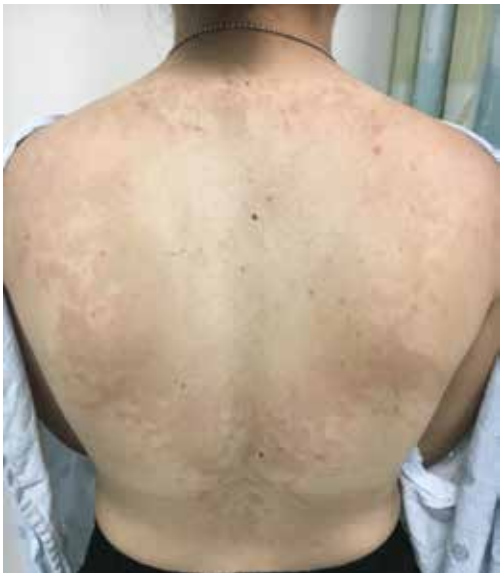

FIGURE 1. Prominent hyperpigmented macules and patches with overlying scale pretreatment across the back.

FIGURE 2. Prominent hyperpigmented macules and patches with overlying scale pretreatment in the left (A) and right (B) arms.

DISCUSSION

SA 30% is a lipid-soluble hydroxybenzoic acid with comedolytic and desmolytic qualities. This results in the disruption of epidermal cell cohesion and promotes exfoliation.[2] Lipophilic properties allow SA to penetrate sebaceous glands and disrupt sebum production, making it particularly effective in seborrheic conditions such as acne. This mechanism may have increased therapeutic effect in this case.[3] Additionally, as a salicylate, SA possesses anti-inflammatory properties, though this effect is most pronounced at lower concentrations. SA 30% is considered a superficial peel, as the depth of chemexfoliation is limited to the epidermis.[3] A modified SA preparation is a safe and effective treatment for moderate-to-severe acne vulgaris. The apparent pseudofrost during application is due to precipitated SA, rather than the precipitation of dermal proteins seen in deeper peels, such as trichloroacetic acid.[2] Unlike glycolic or pyruvic acid peels, SA does not require neutralization.

SA is cost-effective and has been used safely in all skin types to treat various epidermal conditions, including acne vulgaris, melasma, photodamage, freckles, lentigines and postinflammatory hyperpigmentation (PIH).[2] Mild adverse effects occur in about 15% to 30% of patients and include prolonged erythema, intense exfoliation, dryness, crusting, and pigmentary dyschromias. Rare adverse effects include systemic toxicity (salicylism) and hypoglycemia. Contraindications to SA 30% peels include history of allergy to salicylates, active bacterial or viral infection, dermatitis in the treatment area, pregnancy, and skin malignancy.[2]

Chemical peels are typically used with caution in patients with skin of color due to a higher risk of PIH. However, SA 30% has been shown to be safe and effective in these populations.[4] A study by Grimes found that 88% of patients with Fitzpatrick skin types V and VI experienced significant improvement in PIH, melasma, or enlarged pores with minimal to no adverse effects.[4] Subsequent larger studies have reinforced these findings. In a study involving 250 patients with Fitzpatrick skin types IV and V, no patients experienced PIH, confirming the safety of SA in darker skin tones. This is likely due to the superficial nature of the peel, which does not affect the basal layer of the epidermis where melanocytes reside, reducing the risk of pigmentary complications. Additionally, SA peels are self-neutralizing, unlike glycolic or trichloroacetic acid peels, which require manual neutralization and carry a higher risk of PIH if not neutralized properly.[5]

SA has been as shown to be a moderately successful treatment for PIH. The Grimes study found that 4 of 5 patients

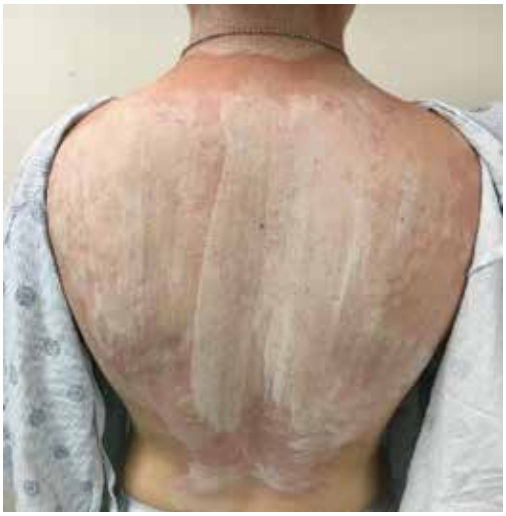

FIGURE 3. Ten minutes after application of salicylic acid 30% in hydroethanolic solution; a pseudofrost of precipitated salicylic acid crystals is visible.

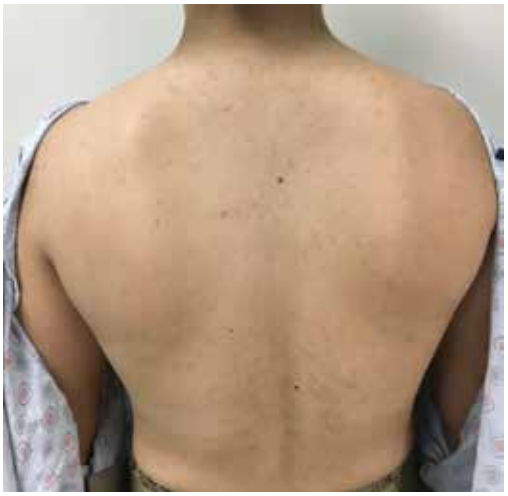

FIGURE 4. After 2 treatments with salicylic acid 30% peel, the patient experienced marked improvement in hyperpigmentation, scaling, and incidentally, acne of the back.

with Fitzpatrick skin types IV and V saw a 75% improvement in PIH after SA peels.[4] Davis et al found a nonsignificant trend toward skin lightening in Korean adults treated for acne and PIH, with significant decreases in erythema and improvements in greasiness, dryness, and scaliness.[6] Importantly, the risk of PIH following TV is higher in patients with skin of color.[7] SA may be effective in treating TV and PIH, offering a multifactorial approach by addressing both conditions while posing a low risk for causing PIH.[8]

TV and other *Malassezia* spp infections are common concerns in dermatology and primary care, with *Malassezia*-associated superficial mycoses (eg, dandruff, pityriasis versicolor, and folliculitis) affecting up to 50% of the population worldwide.[9] Despite this, there has been little recent advancement in antifungal treatments. Ketoconazole, terbinafine, and fluconazole have been in use since the 1980s and 1990s.[8] Most antifungal drugs target ergosterol, a component of the fungal cell wall.[10] Additionally, *Malassezia* spp have been increasingly reported to cause invasive infections in immunocompromised patients.[11] Given the rise in antifungal resistance, the judicious use of antifungals and implementation of novel treatment strategies is essential.

While SA lacks intrinsic antifungal properties, different combinations (Whitfield ointment consisting of 3% SA and 6% benzoic acid; 2% sulfur and 2% SA) have been effective in the treatment of TV.[1] It is theorized that the effectiveness of SA against TV is due to its ability to exfoliate and acidify the stratum corneum, the natural habitat of *M. furfur*.

SA also reduces sebum production by downregulating sebocyte lipogenesis via the sterol regulatory element-binding protein-1 pathway and suppressing the nuclear factor κB (NF-κB) pathway, a key pathway in inflammation.[12] These mechanisms make SA an effective acne treatment. Additionally, *M. furfur* is a lipid-dependent yeast, thus the decreased lipogenesis by sebocytes may be beneficial in treating TV as well.[12] A study of 25 patients with TV in India found that 88% achieved clinical and microbiological cure after 4 once-weekly treatments of a SA 30% peel.[8]

In a study of deployed military personnel, fungal infections affected about 11% of participants.[13] Contributing factors to the development of fungal infections included excessive sweating, humid conditions, and limited access to hygiene facilities. In such settings, traditional antifungal therapies may be less effective or challenging to adhere to, making alternative treatments more desirable. SA peels could offer a practical solution in these circumstances, as they are easily applied in the clinic, require no neutralization or downtime, and do not require the patient to apply medications between visits.

In this case, the patient demonstrated significant improvement with 2 SA peels, with noted improvement in her acne. SA 30% peel was highlighted as a useful treatment option for patients with TV who struggle with topical medication adherence; furthermore, it may be particularly beneficial for patients with concomitant acne.

CONCLUSIONS

This case demonstrates the successful use of in-office SA 30% peel as a treatment for TV. The rapid improvement and resolution of lesions with minimal adverse effects suggest that SA peel may serve as a valuable alternative for patients with extensive disease in difficult-to-reach affected areas, or those who are dissatisfied with traditional therapies. Additionally, the concurrent improvement of the patient's back acne underscores the dual therapeutic potential of this treatment. Given the ease of application, cost-effectiveness, and favorable safety profile, SA 30% peel is a viable option in the management of TV, especially in cases where topical or oral antifungals are impractical. Further studies could help establish standardized protocols and assess long-term outcomes of this treatment modality.

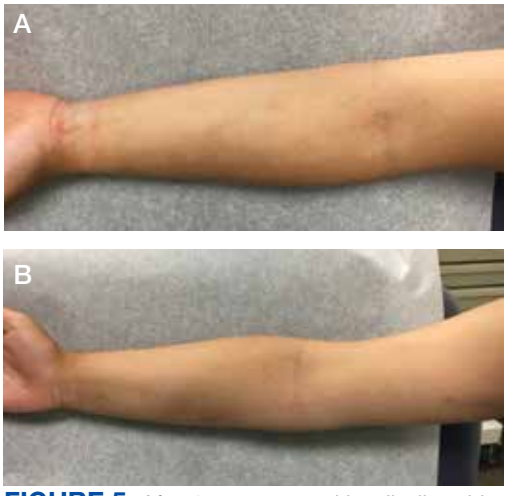

FIGURE 5. After 2 treatments with salicylic acid 30% peel, experienced marked improvement in hyperpigmentation and scaling on the left (A) and right (B) arms were improved.

Author affiliations

[a]Walter Reed National Military Medical Center, Bethesda, Maryland
[b]Uniformed Services University, Bethesda, Maryland

Author disclosures

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Ethics and consent

Written informed consent was obtained from the patient.

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