

# Direct Observed “Soak and Smear” Therapy for Severe Eczematous Dermatitis in the Combat Setting

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**Background:** Eczematous dermatitis is difficult to control in a combat setting and may result in a service member’s early return to the United States. We report on seven patients with presumed eczematous dermatitis for whom traditional treatments had failed.

**Objective:** To evaluate the effectiveness of “soak and smear” in eczematous dermatitis.

**Method:** The patients were treated with 3 days of direct observed soak and smear therapy with topical steroids.

**Results:** All seven patients significantly improved with treatment, showing a decrease in investigator global assessment, patient self-assessment, and pruritus scores.

**Conclusion:** This study demonstrates that direct observed soak and smear therapy is an effective tool with which to rapidly improve severe eczema. Additionally, this method can be used in the combat environment.

IT is essential to maintain the health of troops in a deployed environment. Cramped conditions, inhospitable environments, and exotic pathogens are some of the factors contributing to the inherent complexity of deployment health. Skin ailments that are well controlled in traditional hospital settings may flare up in the combat setting because of harsh environmental conditions and limited access to routine hygiene care. This may result in a service member’s being unable to complete their assigned mission and an early return to the United States for treatment.

Eczematous dermatitis (ED) and xerotic eczema are generally managed through adequate skin hydration and control of the flaring condition. ED patients have an increased vulnerability to infection and are often unable to complete daily duties. In the deployed environment, ED is a potentially disabling medical condition and accounts for approximately 15% of total dermatology clinic visits.<sup>1</sup>

Owing to the unique nature of the combat environment, we used the “soak and smear” technique<sup>2</sup> for some of the more severe presentations of ED in the hopes of returning these patients to duty in the theater rather than returning them stateside for treatment. The soak and smear treatment is an alternative therapy that has proven highly successful in patients with refractory dermatoses. This report presents seven deployed patients with severe flares of ED for whom standard ED treatments had failed. We used direct observed soak and smear therapy for all patients, and we present their outcomes here.

## Methods

We performed a proof-of-concept observation in a convenience cohort of seven male subjects aged 22 to 52 years. Each patient had failed to respond to the available traditional pharmacologic therapies for ED, including topical and systemic steroids (Table 1). Each patient was assessed on day 0 by the physician to determine the total affected body surface area and an investigator global assessment score (range 0–4). Individuals were asked to provide their own patient assessment score (range 0–3) and a pruritus score (range 0–3).<sup>3,4</sup> Biopsies of affected sites were also performed for verification of the patients’ diagnoses.

Patients were admitted to the hospital for 3 days. Each patient underwent a soak and smear treatment twice daily. Patients were soaked for 20 minutes in plain warm water, followed by the immediate smearing of triamcinolone ointment to the entire body, excluding the face, axilla, and

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**Table 1.** Patient Demographics and Treatment History

| Patient No. | Age (yr) | Sex | BSA (%) | Previous Treatment             | Treatment at Time of Presentation |
|-------------|----------|-----|---------|--------------------------------|-----------------------------------|
| 1           | 52       | M   | 70      | TS, OS, OABX                   | OS, OABX                          |
| 2           | 22       | M   | 50      | TS, OS, IVS, OAF, OS, IMS, TAF | OAF, TEM                          |
| 3           | 23       | M   | 75      | OABX                           | OS, OAF                           |
| 4           | 33       | M   | 55      | TS, OAF, TAF, OS, IVS, OAF     | OS                                |
| 5           | 26       | M   | 60      | OABX                           | OAF                               |
| 6           | 36       | M   | 85      | TS, TAF, OABX                  | OS, OABX                          |
| 7           | 24       | F   | 30      | TAF, OAF, IMS                  | TEM, IMS                          |

BSA = body surface area; IMS = intramuscular steroid; IVS = intravenous steroid; OABX = oral antibiotic; OAF = oral antifungal; OS = oral steroid; TAF = topical antifungal; TEM = topical emollient; TS = topical steroid.

groin. Without drying the skin, the patients then put on clean clothing. This regimen was repeated twice daily for 3 days. Patients were discharged at the end of day 3 with specific instructions to continue applying triamcinolone ointment twice daily as above, but without prior soaking. This was continued for an additional 11 days. Patients received an investigator global assessment (IGA) score on days 0, 2, 7, and 14. On days 0, 2, and 7, patients were asked to provide self-assessment and pruritus scores. The aftercare instructions to the patient were as follows: during periods with normal skin, they were to use emollients twice a day; during periods of flare, they were to increase to using triamcinolone ointment 0.1%. In addition, they were given a handout on the causes of eczema and on treatment strategies for eczema.

## Results

The biopsy specimens were consistent, showing spongiotic dermatitis in all seven patients. Over the course of treatment, there was a general trend of improvement in all scores (Table 2 and Table 3). Specifically, the investigator global assessment (IGA) mean score (range 0–5) decreased from 4 on day 0 to 1 on day 2 ( $p < .0001$ )

and to 0.43 on day 14 ( $p < .0001$ ). The patient self-assessment mean score (range 0–3) also decreased, from 3 on day 0 to 0.57 on day 7 ( $p < .0001$ ). The pruritus mean score (range 0–3) decreased from 2.7 on day 0 to 0.29 on day 7 ( $p < .0001$ ). During the soak and smear period (day 0 to day 2), the reductions in IGA score, pruritus score, and patient self-assessment score (see Table 2 and Table 3) were statistically significant (IGA,  $p < .0001$ ; pruritus score,  $p < .002$ ; patient self-assessment score,  $p < .003$ ).

## Discussion

An important feature in ED is severe skin dryness centering on the skin's increased epidermal water loss.<sup>5</sup> A focus on adequate hydration is a key component in the successful management of this condition. The soak and smear technique is a simple method that addresses the basic needs of skin affected by conditions such as severe eczema by concurrently combining aggressive hydration with the use of an emollient or medication. In this study, there was a statistically significant improvement in the

**Table 2.** Investigator Global Assessment Scores

| Patient No. | Day 0    | Day 2    | Day 7       | Day 14      |
|-------------|----------|----------|-------------|-------------|
| 1           | 4        | 1        | 0           | 0           |
| 2           | 5        | 2        | 1           | 1           |
| 3           | 4        | 1        | 1           | 0           |
| 4           | 3        | 0        | 0           | 1           |
| 5           | 4        | 1        | 1           | 1           |
| 6           | 5        | 2        | 1           | 0           |
| 7           | 3        | 0        | 0           | 0           |
| Mean (SD)   | 4 (0.82) | 1 (0.82) | 0.57 (0.53) | 0.43 (0.53) |
| Median      | 4        | 1        | 1           | 0           |

**Table 3.** Patient Self-Assessment and Pruritus Scores

| Patient No. | Patient Self-Assessment Score |       |       | Pruritus Score |       |       |
|-------------|-------------------------------|-------|-------|----------------|-------|-------|
|             | Day 0                         | Day 2 | Day 7 | Day 0          | Day 2 | Day 7 |
| 1           | 3                             | 1     | 0     | 3              | 0     | 0     |
| 2           | 3                             | 3     | 1     | 3              | 1     | 1     |
| 3           | 3                             | 1     | 1     | 3              | 2     | 1     |
| 4           | 3                             | 2     | 1     | 2              | 2     | 0     |
| 5           | 3                             | 2     | 1     | 2              | 1     | 0     |
| 6           | 3                             | 2     | 0     | 3              | 0     | 0     |
| 7           | 3                             | 1     | 0     | 3              | 0     | 0     |
| Mean        | 3                             | 1.71  | 0.57  | 2.71           | 0.86  | 0.29  |
| SD          | 0                             | 0.75  | 0.53  | 0.49           | 0.90  | 0.49  |
| Median      | 3                             | 2     | 1     | 3              | 1     | 0     |

mean and median IGA, patient self-assessment, and pruritus scores of all patients. We attribute this improvement to the effects of adequate hydration provided by the soak and smear technique, an increase in the removal of scale and crust, and an increase in the delivery of the topically applied medication. These results indicate that soak and smear therapy is an effective treatment of ED refractory to conventional therapies.

It is well documented that patients are noncompliant with topical therapies.<sup>6</sup> Direct observed therapy (DOT) can be an effective method for ensuring patient compliance with medical therapy. DOT has been used to ensure compliance when treatment of a specific disease is of the utmost importance.<sup>7</sup> Tuberculosis and sexually transmitted disease are the classic cases of DOTs; however, various phototherapy treatments are DOTs in essence. The combat setting is a unique environment that allows the physician to admit patients to the hospital for DOT, as in this case. DOT with the soak and smear technique is an effective measure for gaining control of severe ED in the deployed setting. Although it may not be practical in the civilian setting to admit patients for therapy, this proof-of-concept observational study displays the usefulness of doing so in the treatment of eczematous and other inflammatory skin conditions.

The limitations of this small proof-of-concept study are many. The sample size was small, and there was no control group. All of the patients had been treated with systemic and topical steroids for weeks to months prior to referral to the dermatology clinic (see Table 1). However, numerous treatments had failed for all of the patients, necessitating a different approach.

## Conclusion

The investigator global assessment, patient self-assessment, and pruritus scores are imperfect measures of the severity

of eczema. However, we feel that the dramatic reduction in scores that we observed in all of these assessments is an accurate reflection of the usefulness of DOT. Although DOT is not always the most cost-effective therapy for dermatologic conditions, it is our belief that the improved outcomes we observed underscore the need for this type of treatment. Additionally, this method can be used in the combat environment to effectively treat severe eczema.

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