

The Effective Topical Treatment and Post-exposure Prophylaxis of Poison Ivy: Objective Confirmation



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OBJECTIVE

Exposure to poison ivy (PI) is the most common cause of allergic contact dermatitis (ACD), causing 10 to 50 million episodes each year.¹ Urushiol, a chemical mixture of catechols, is responsible for the ACD caused by members of the *Toxicodendron* genus of the plant family Anacardiaceae. Once urushiol touches the skin it begins to penetrate in minutes and is completely bound within 8 hours.² While avoidance and protective clothing remain the primary method of preventing the ACD, once the rash is established both the treatment and post exposure prophylaxis (PEP) are suboptimal. Previous studies have indicated that the commercial available mixture of alcohol solubles and anionic surfactants (Zanfel) is effective in treating ACD but efficacy has not been established through objective evaluation of photographs of the ACD rash. The purpose of this study was to determine if objective observers can determine whether subjects with experimentally induced ACD received Zanfel or placebo for either treatment or post exposure prophylaxis.

METHODS

This was a prospective, double blind, randomized, placebo controlled trial in which 20 paid subjects had ACD induced experimentally by applying natural poison ivy to both legs of each subject. Subjects were then randomized; either Zanfel or an identically appearing placebo was applied as both treatment (left leg) and as post exposure prophylaxis (right leg). Subjects were given diphenhydramine to use as needed for itch and no steroids were used. Pictures were obtained at days 3, 7, and 10 after development of ACD rash. Two independent investigators, not

previously involved with the gathering of initial data (one emergency medicine (EM) resident and one EM attending), were asked to view 3 sets of photographs from each of the 20 subjects (see figures 1 and 2). Investigators rated the degree of rash on each leg on a 10 cm VAS scale and noted in binary fashion whether the rash had improved or not. Finally, while viewing all 3 photographs of both legs each observer recorded his judgment as to whether the subject had received Zanfel or placebo for treatment and post exposure prophylaxis.

FIGURE 1. ZANFEL TREATED LEGS



FIGURE 2. PLACEBO TREATED LEGS



Subject 22

Subject 13

RESULTS

FIGURE 3. ASSESSMENT OF IMPROVEMENT

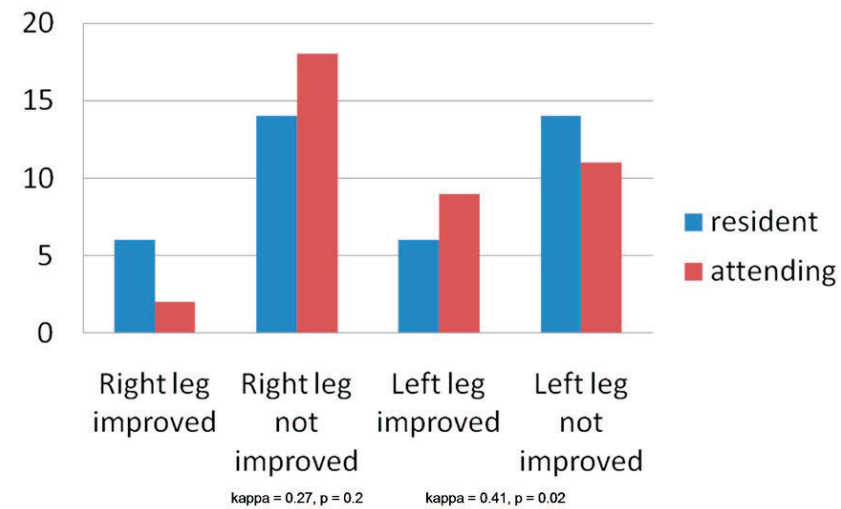
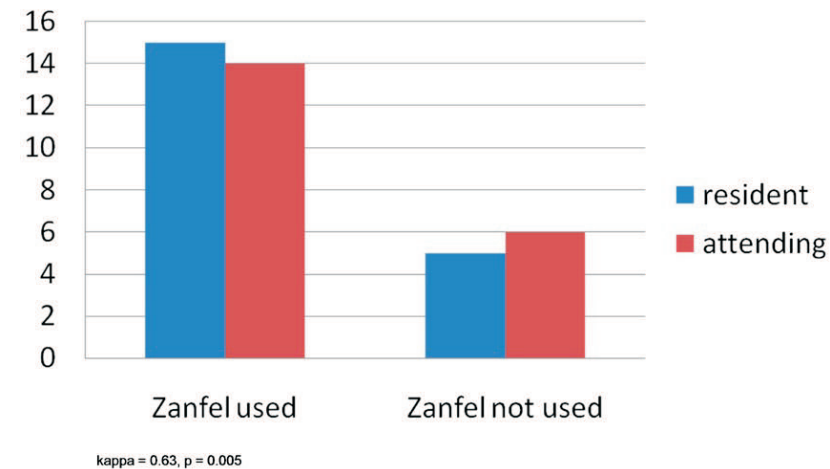


FIGURE 4. ASSESSMENT OF WHETHER ZANFEL WAS USED



Using Spearman's rank order correlation (rs), there was excellent inter-rater reliability between the observers in rating the degree of rash on both the treated (left) and prophylaxed (right) leg (rs= .74 and .87 respectively, p<.001). (see figure 3). Agreement as to whether there was improvement was less robust, however better for the treated (left) leg than the prophylaxed (right) leg (kappa=.41, p=.02;

kappa=.27, p=.20, respectively) (see figure 3). When evaluating both legs together investigators correctly identified the use of Zanfel rather than placebo in 10/12 cases (83%). When comparing inter-rater reliability between the two physicians assessment of whether patients' legs had been treated with Zanfel or placebo there was a fairly strong degree of consensus (k=0.62, p=0.005) (see figure 4).

DISCUSSION

Different modalities of treatment for *Toxicodendron* dermatitis exist. The goal of treatment is to decrease itching (the main reason individuals seek treatment), redness and heat. Many modalities are available for the treatment of ACD with variable results. Some of these include wet to dry dressings which help to reduce itching, redness and blisters, and aluminium subacetate, a 5% solution or powder that can be dissolved in water, have shown no superior improvement in clinical manifestations of the rash.³ Some individuals utilize warm water with colloidal oatmeal or cornstarch for its soothing effect. The application of the most potent topical steroids does little to help poison ivy dermatitis once well established, although early application, particularly under occlusion, is used with mild to moderate success. However, the cream must be continued for 2-3 weeks or the dermatitis may reappear.⁴ Antihistamines have little effect on the rash itself and often only allow for some symptomatic relief with the risk of concurrent sedation.⁴ Systemic steroids are used in the treatment of severe *Toxicodendron* dermatitis. These patients usually have more than 25% of their body surface area involved. To effectively treat ACD caused by *Toxicodendrons* requires



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prolonged treatment with high dose steroids to avoid rebound phenomenon.⁵ But systemic steroids have unwanted side effects such as immunosuppression, avascular necrosis and elevation of blood glucose especially in diabetics. In a previous related study we induced *Toxicodendron* ACD on the arms of paid volunteers. One hour post exposure volunteers' right arms were randomly washed with either Zanfel or placebo. The volunteers were allowed to develop a rash and then evaluated at days 3, 7, and 10 and pictures were obtained. We found that Zanfel is effective in the treatment of itch associated with ACD, but less effective in the improvement of the appearance of the rash. Conversely, when used as post exposure prophylaxis (PEP), there was a significant decrease in development of ACD rash in Zanfel treated volunteers. In this study two independent investigators were asked to view pictures of the above subjects. When looking at the individuals legs there was moderate agreement between investigators as to whether there was improvement over time of the induced rashes. However, when viewing both treated and PEP legs together there was a strong degree of consensus regarding whether or not Zanfel had been used (k=0.63, p=0.005).

CONCLUSIONS

A widely available topical agent is effective when used for treatment and post exposure prophylaxis of experimentally induced acute contact dermatitis as judged by objective observers viewing photographs of the urushiol induced rash.

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