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SUPPRESSIVE EFFECTS OF TOPICAL MOMETASONE FUROATE AND TACROLIMUS ON SKIN PRICK TESTING IN CHILDREN

Abstract: Skin prick tests were performed in 12 children with atopic eczema before and after 2 weeks of treatment with topical mometasone furoate and tacrolimus. Both treatments significantly suppressed the allergen wheal size. Mometasone furoate reduced the histamine wheal size as well. Skin prick testing in children treated with topical glucocorticoids or tacrolimus is associated with a risk of false-negative test results.

The aim of the present study was to assess whether treatment with topical mometasone furoate or tacrolimus affects skin prick test responses.

Twelve children aged 5 to 12 years were included in a randomized crossover study. The subjects had atopic eczema according to the criteria of Hanifin and Rajka and a positive skin prick test reaction to at least one allergen. After a 2-week run in, the children were allocated to 2 weeks treatment with mometasone furoate or tacrolimus, and subsequently after 2 weeks of wash out they were given the reverse treatment. Mometasone furoate ointment 0.1% (Elocon®, Scherin-Plough, Kenilworth, NJ, USA) was applied once daily at 7 P.M. and tacrolimus ointment 0.1% (Protopic®, Astellas-Pharma, Tokyo, Japan) twice daily at 7 A.M. and 7 P.M. all over the body. Only study medications were allowed throughout the trial and no subjects used any anti-inflammatory treatment 3 weeks prior to study entry.

At inclusion and on the last day of treatments a skin prick test with 10 common allergens was performed (Soluprick®SQ; Alk-Abello Nordic, Kungsbacka, Sweden) on the volar surface of the forearm. Tested allergens were birch, timothy grass, mugwort, horse, dog, cat, house dust mites (*Dermatophagoides pteronyssinus* and

D. farinae), and molds (*Alternaria* and *Cladosporium*). Histamine 10 mg/mL was used as positive control. The wheal responses were outlined after 15 minutes and transferred to a paper with transparent tape. An observer blinded to the treatment measured the size of each wheal as $(D + d)/2$, where D is the largest diameter and d is the perpendicular diameter at midpoint of D . Informed consent was obtained from all children and their parents. Data were analyzed using repeated measures ANOVA.

RESULTS

Six girls and six boys with a mean duration of atopic eczema of $84 (\pm 22)$ months were included. At inclusion they had positive skin prick test reactions to a total of 34 allergens. Compared to run in (4.4 ± 1.5 mm), mean allergen wheal size was reduced 2.4 mm (95% CI 1.8–3.0) by mometasone furoate and 1.5 mm (95% CI 1.0–1.9) by tacrolimus ($F = 44$, $p < 0.001$; Fig. 1). The mean histamine wheal size (run in 4.1 ± 0.5 mm) was reduced 1.0 mm (95% CI 0.4–1.7) by mometasone furoate ($F = 7.3$, $p = 0.004$) but not affected by tacrolimus (95% CI –0.6 to 0.7) (Fig. 2).

DISCUSSION

Whereas long-term systemic glucocorticoid treatment does not affect allergen-induced wheals (1), the suppressive effect of topical glucocorticoids on immediate allergic reactions has been demonstrated in nasal challenge studies, in the lower airways, and in the skin (2–4). One week's application of clobetasol-17-propionate was

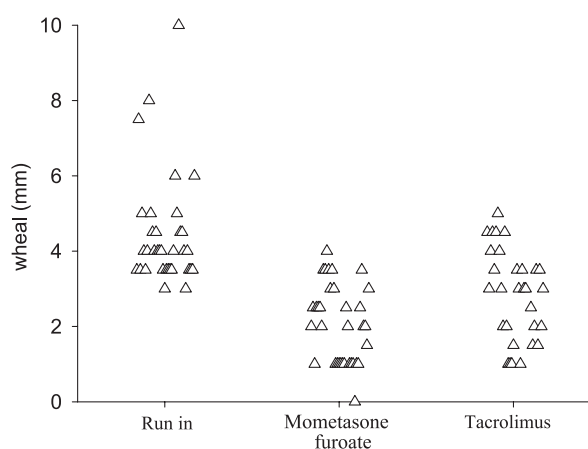


Figure 1. Individual wheal sizes (diameter) of the 34 positive allergens during run in and when retested during treatment with mometasone furoate ($n = 34$) and tacrolimus ($n = 30$). Compared to run in (4.4 mm) the mean wheal size was significantly suppressed by mometasone furoate (mean 2.0 mm) and tacrolimus (mean 2.9 mm).

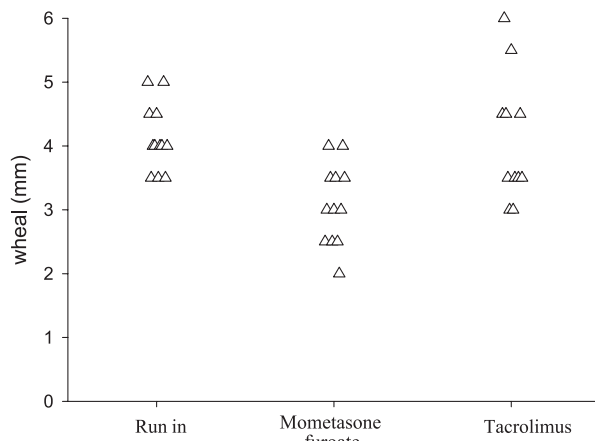


Figure 2. Individual wheal size (diameter) of the 12 patients' histamine tests during run in and during treatment with mometasone furoate ($n = 12$) and tacrolimus ($n = 11$). Compared to run in (4.1 mm) the mean histamine wheal size was significantly suppressed by mometasone furoate (mean 3.1 mm) but not by tacrolimus (mean 4.1 mm).

reported to reduce allergen induced wheals by 47% but had no effect on the histamine response (4). However, when applied for 2 or 4 weeks, the allergen response was further reduced and the histamine response was suppressed as well (5), consistent with our findings. The suppression of the allergen response may be explained by a glucocorticoid-induced depletion of mast cells and decreased histamine content in the skin (5). Conversely, the histamine-induced wheal is probably caused by a direct effect on the histamine receptor independently of mast cells (1). The suppression of the histamine response may be caused by a direct effect of glucocorticoids on the permeability of the small blood vessels (6).

As systemic corticosteroid treatment seems not to affect skin prick test results (1), we do not believe that the observed suppression of skin reactivity could be due to a systemic effect of topical treatments. Our findings of a suppressive effect of tacrolimus on allergen-induced wheals are in agreement with in vitro studies, which have shown that tacrolimus is a potent inhibitor of antigen-stimulated histamine release and cytokine production by mast cells (7).

In conclusion, skin prick testing in children treated with topical glucocorticoids or tacrolimus is associated with a considerable risk of false-negative results. Importantly, the histamine test may not be a valid positive control in these patients.

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DERMOSCOPIC FEATURES IN BEAN (BLUE RUBBER BLEB NEVUS) SYNDROME

Abstract: Dermoscopy has become an important tool for evaluating skin lesions in children. We report the dermoscopic findings in a case of Bean syndrome and emphasize the utility of this technique in vascular lesions.

Bean syndrome is a genodermatose characterized by venous malformations of the skin and viscera, predominantly along the gastrointestinal tract, but can also compromise various organs and systems (1). Pediatric dermoscopy is a new field to determine vascular morphology development and differentiation with other