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Contact Allergy to Topical Corticosteroids in Atopic Dermatitis: The Importance of Allergen Selection and Formulation in Diagnostic Accuracy

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Contact allergy to topical corticosteroids in patients with atopic dermatitis

Atopic dermatitis (AD) is a chronic, relapsing inflammatory skin disease characterized by barrier dysfunction and immune dysregulation.

Topical corticosteroids (TCS) remain the mainstay of treatment, effectively reducing inflammation and pruritus. However, prolonged or repeated use may lead to allergic contact dermatitis (ACD), which can mimic AD flares and complicate management.

Increasing evidence indicates that AD and ACD frequently coexist, with contact sensitization contributing to chronic and treatment-resistant eczema.

Standard patch test panels, limited in hapten diversity and vehicle representation, may fail to identify clinically relevant corticosteroid allergies.

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Cohen DE. Hand Dermatitis in Children. Pediatric Clinics of North America. 2014;61(2):239–260.

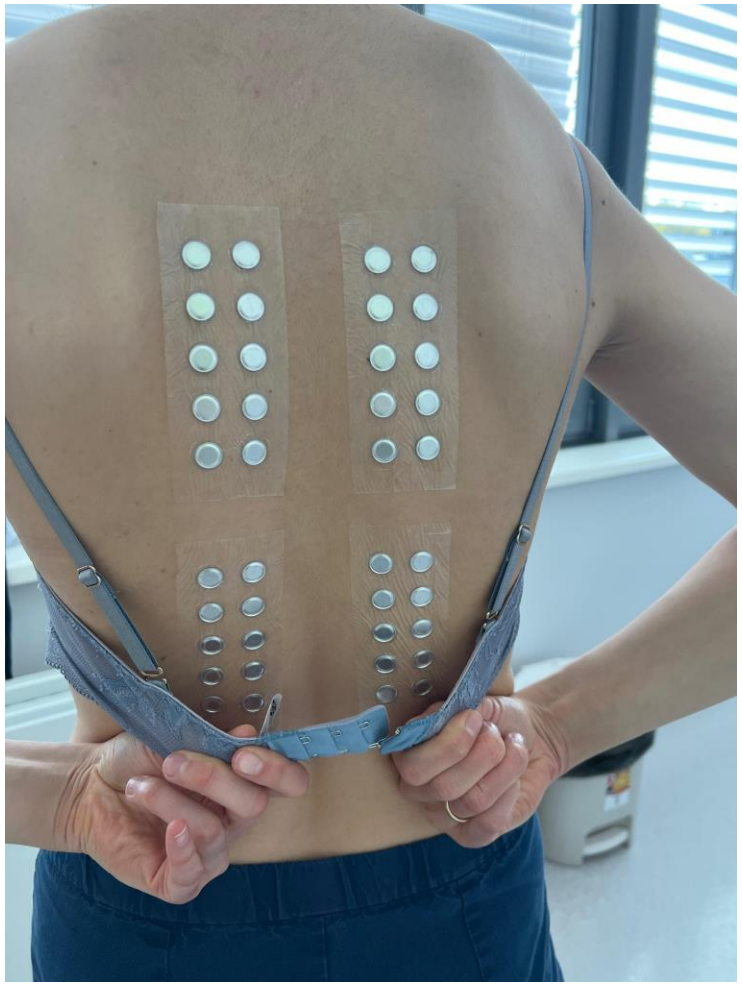
Contact allergy to topical corticosteroids in patients with atopic dermatitis

The Polish Baseline Series includes tixocortol pivalate (Group A) and budesonide (Group B) as markers of corticosteroid allergy.

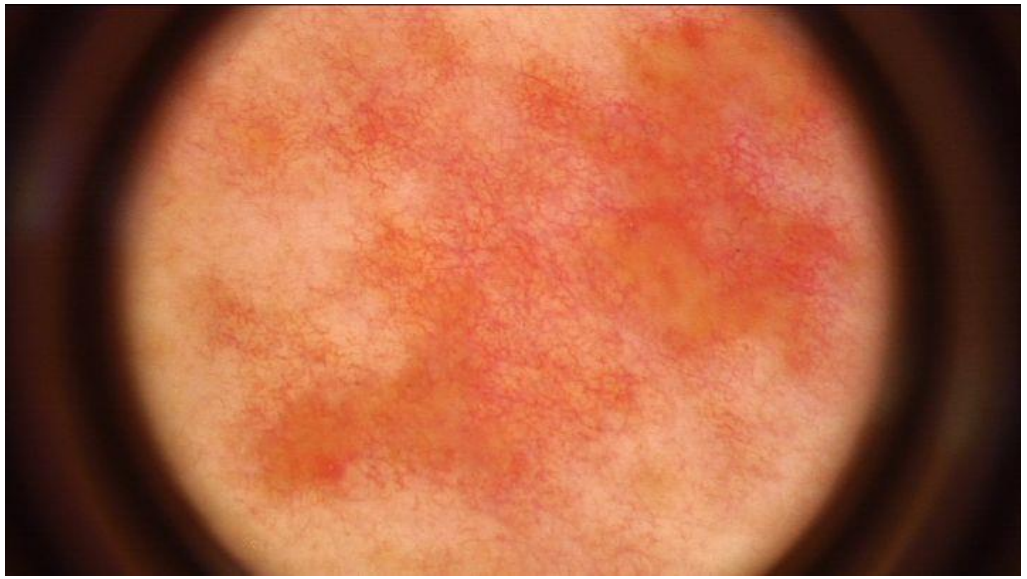
However, these haptens do not adequately represent the corticosteroids most frequently used clinically, such as hydrocortisone butyrate, mometasone furoate, and clobetasol propionate.

Although a reaction to tixocortol pivalate may indicate sensitization to Groups A and D2 through cross-reactivity, this correlation is incomplete and increases the risk of false-negative results when relying solely on the baseline series.

An important diagnostic consideration is the formulation of the tested allergen — when expanding the panel, it should be specified whether the hapten is tested as an ointment or in solution, as the solvent markedly influences allergen penetration and test sensitivity.



Aim of the study, Materials and Methods



Dermoscopic pattern of contact allergy

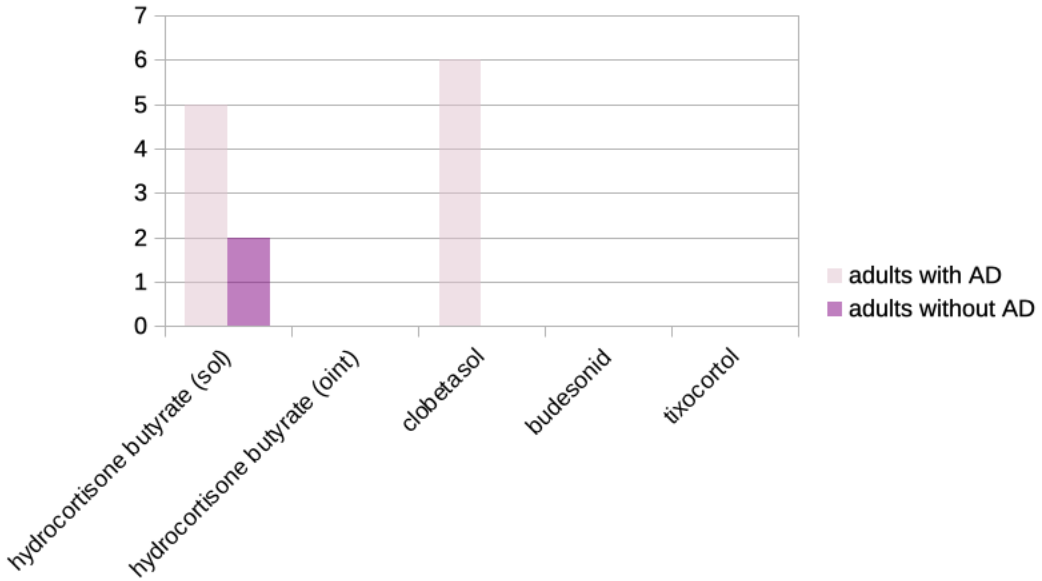
Gdańsk, 2024

The study aimed to evaluate the prevalence, severity, and clinical relevance of contact allergy to topical corticosteroids in patients with AD, compared to those with ACD without AD. Special emphasis was placed on the diagnostic role of allergen formulation, particularly the influence of solvent and vehicle on patch test sensitivity.

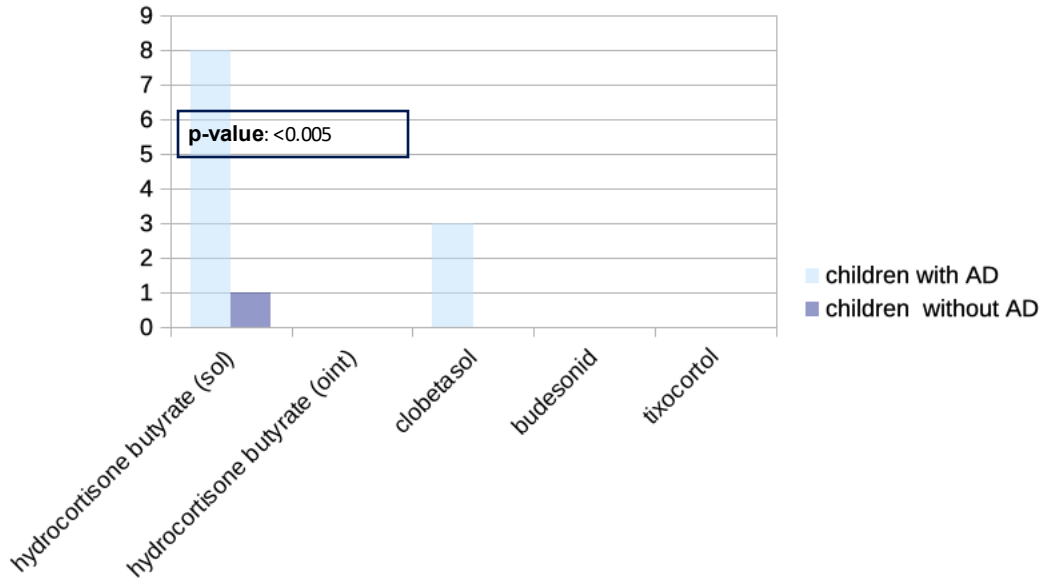
A retrospective analysis was conducted between 2020 and 2024 at the Department of Dermatology, Medical University of Gdańsk. The study included 120 patients who underwent patch testing: 60 with atopic dermatitis and concomitant ACD, and 60 with ACD without AD. Testing employed the Polish Baseline Series supplemented with **hydrocortisone butyrate (ointment)**, **hydrocortisone butyrate (alcoholic solution)**, and **clobetasol propionate**, with readings at 48, 72 hours, and day 7 according to ICDRG criteria.

Distribution of Contact Allergy to Topical Corticosteroids in Adults and Children with Atopic Dermatitis

Contact allergy to topical corticosteroids in adults with and without AD



Contact allergy to topical corticosteroids in children with and without AD

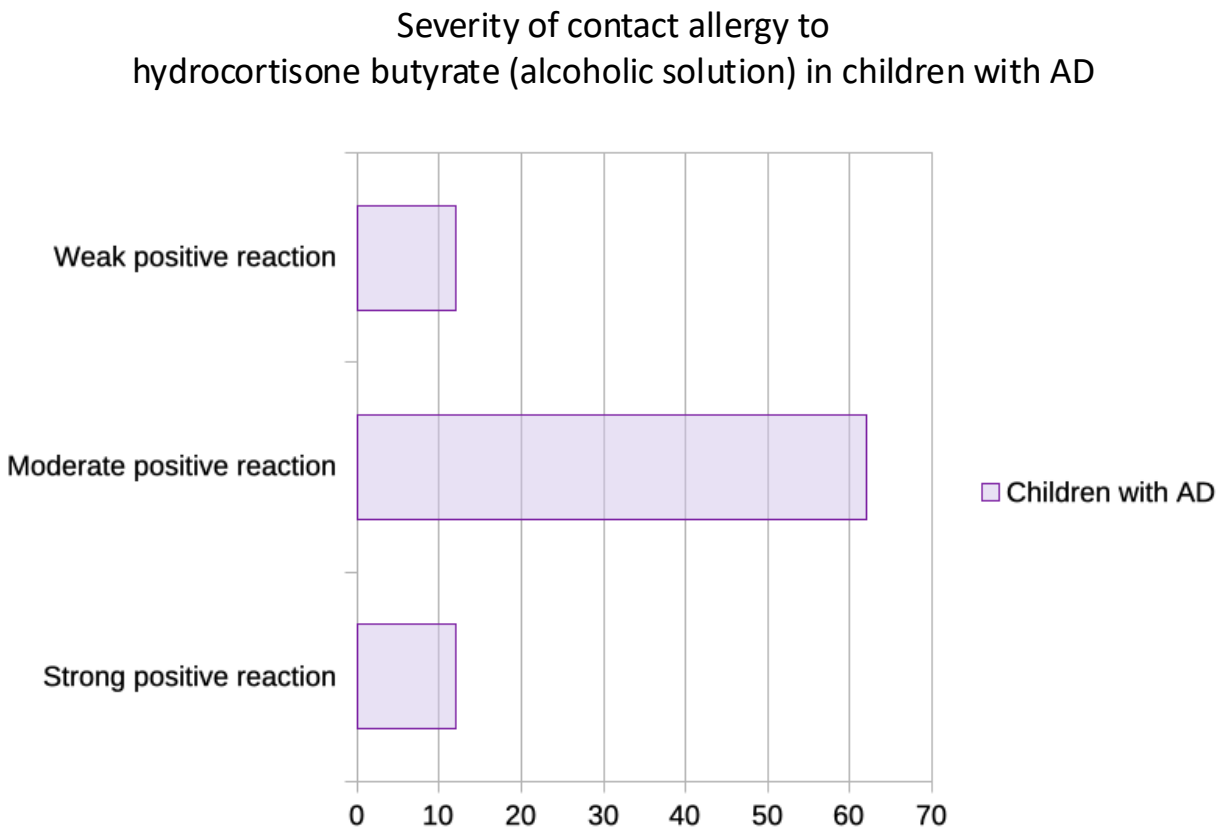


Contact sensitization to topical corticosteroids was significantly more frequent in patients with AD than in non-atopic controls.

In adults, positive reactions were mainly directed to clobetasol propionate and hydrocortisone butyrate (alcoholic solution), reflecting greater exposure to potent steroids.

In children, hydrocortisone butyrate (alcoholic solution) was the predominant allergen, while no reactions occurred to the ointment form. None of the sensitized patients reacted to tixocortol pivalate or hydrocortisone butyrate, indicating lack of cross-reactivity.

Severity of contact allergy to topical corticosteroids



In children with atopic dermatitis, allergic reactions to hydrocortisone butyrate **(alcoholic solution)**, were statistically more likely to be of **moderate or strong intensity** compared with mild responses.

In all other groups, reactions to topical corticosteroids were **exclusively mild**.

Conclusions

- Contact allergy to topical corticosteroids is more prevalent and clinically significant in patients with atopic dermatitis.
- Hydrocortisone butyrate (alcoholic solution) and clobetasol propionate were identified as the most relevant sensitizers.
- Reactions were predominantly moderate to strong (++/+++), particularly among children with AD sensitized to hydrocortisone butyrate (alcoholic solution).
- The Polish Baseline Series, limited to tixocortol pivalate and budesonide, may not detect all clinically relevant corticosteroid allergies.
- The formulation of the tested allergen plays a decisive diagnostic role — solution-based preparations enhance hapten penetration and improve test sensitivity.

No conflicts of interests

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