The Importance of Vehicles in Management of Atopic Dermatitis

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Atopic Dermatitis (AD) is estimated to affect 15-20% of children and remains a major health consideration for pediatricians and dermatologists.[1] Over the past three decades, studies have shown an increase in the prevalence of AD in industrialized nations, with lower numbers seen in developing countries.[2] For most children, AD presents within the first year of life, and 80-90% of patients are diagnosed by age 5.[3]

The disease course is characterized by recurrent exacerbations and remissions. As patients age, flares tend to become less common, and only a minority of patients continue to experience the signs and symptoms of AD into adulthood. Asthma develops in roughly one third of patients, and seasonal allergies are present in roughly two-thirds.[4]

Emollients and topical corticosteroids remain the foundation of treatment for mild-to-moderate AD. Due to decreased expression of filaggrin and other dysfunctions of the epidermal barrier, AD patients are inherently xerotic and require frequent skin hydration. Topical steroids are used to improve symptoms, shorten the duration of acute flares, and prolong the duration between exacerbations. They deliver a multi-pronged effect due to anti-inflammatory, immunosuppressive, anti-proliferative, and vasoconstrictive properties. However, topical steroids are known to inhibit lipid synthesis and hence, worsen the impairment of epidermal barrier. Therefore, the vehicle formulation of topical steroids plays a significant role in efficacy, tolerability, and treatment compliance. Lotions, creams, and ointments each provide increasing levels of potency and hydration, but along with moisturization comes greasiness. Gels are rapidly self-drying, leading to a cooling effect when used on exudative inflammation.

Newer vehicles include foam and spray preparations. Foams leave minimal residue after application, and sprays are particularly well-suited for large body surface areas, where preparations can be rapidly and diffusely applied. The development of these vehicles represents a significant step forward for patients, as foams and sprays have demonstrated high levels of efficacy, cosmetic appeal, and patient compliance.

Low-potency steroids are preferred for chronic conditions like AD, especially in areas of the body with thinner skin and in pediatric patients. As such, low-potency steroids constitute the primary agent for children with AD. Non-steroid topicals—such as pimecrolimus, tacrolimus, and crisaborole—are useful adjuncts, although none are FDA-approved for patients under the age of 2. We have only very few topical steroids approved all the way down to 3 months of age.

Future treatment algorithms will undoubtedly be influenced by application of the biologic agent dupilumab in pediatric populations. Recent phase III clinical trials evaluating dupilumab in adolescents aged 12-17 years with moderate-to-severe AD demonstrated significant improvements in skin clearing, itching, and quality of life measures.[5] Clinical trials are also underway for children aged 6 months–11 years. FDA approval in pediatric patients is likely to arrive within the next year, providing the first biologic agent for these patients.

The treatment horizon for pediatric AD is encouraging. Newer pharmaceuticals are now joined by novel formulations of established medications, which arms dermatologists with an increasing array of treatments to tackle this challenging condition.

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References

1. Asher MI, Montefort S, Bjorksten B, et al. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood: ISAAC Phases One and Three repeat multicountry cross-sectional surveys. *Lancet.* 2006;368(9537):733-43.
2. Nutten S. Atopic dermatitis: global epidemiology and risk factors. *Ann Nutr Metab.* 2015;66 Suppl 1:8-16.
3. Kamer B, Pasowska R, Dolka E, et al. Prevalence of atopic dermatitis in infants during the first six months of life: authors' observations. *Postepy Dermatol Alergol.* 2013;30(5):277-81.
4. Somanunt S, Chinratanapisit S, Pacharn P, et al. The natural history of atopic dermatitis and its association with Atopic March. *Asian Pac J Allergy Immunol.* 2017;35(3):137-43.
5. Simpson EL, Paller AS, Siegfried EC, et al. Dupilumab Efficacy and Safety in Adolescents with Moderate-to-Severe Atopic Dermatitis: Results from a Multicenter, Randomized, Placebo-Controlled, Double-Blind, Parallel-Group, Phase 3 Study. The 27th European Academy of Dermatology and Venereology Congress, Paris, France, 15th September, 2018.