Revive the Dennie-Morgan Fold: A Forgotten Sign of Atopic Dermatitis in Children

To the Editor,

In 1980, Hanifin and Rajka (1) proposed major and minor diagnostic criteria for atopic dermatitis (AD). Major associations included pruritus, dry skin, and history of atopy. One minor feature included Dennie-Morgan Folds (DMFs), which manifest as secondary creases in the skin underneath the inferior eyelid, usually found in infants (2). In an attempt to refine these criteria, a study evaluating 210 patients with an existing AD diagnosis observed DMF in 84% of AD cases. A pediatric study in Bijapur, India on 174 children under 16 years of age with AD identified DMF to be the most prevalent minor criterion. DMFs were found in 71.8% of the study's population and was followed by palmar hyperlinearity and xerosis in prevalence (2).

Although DMF pathophysiology remains unclear, we suggest a theory stemming from nocturnal pruritus (NP). The two leading causes of NP are AD and psoriasis, both of which interfere with the patient's sleep quality. Children with increased NP have greater sleep fragmentation and difficulty waking up in the morning (3). A lack of melatonin rhythmic secretions resulting in circadian misalignment may serve as an intermediary for DMF onset. As more blood perfuses the skin under the eyes, edematous fluid enhances dysregulation of the collagen fibers under the eyelids. NP also manifests as facial touching and rubbing or scratching the eyelids during sleep, which can aggravate tissue surrounding the eye (3).

AD affects 15-20% of the pediatric population, whereas food allergies, some life-threatening, are found in up to 30% of children with AD, compared with 0.1-0.6% of children in the general population (2). Identifying DMF in children can facilitate the diagnosis of AD and thus lead to the necessary tests to determine whether conditions associated with AD exist, such as food allergy. DMFs are indicative of an AD diagnosis and can be especially critical for children who have life-threatening food allergies associated with their AD (3).

One challenge in using DMF as a marker for AD are its different manifestations across ethnic and racial groups. In a study of 160 children aged 3-11 years in London, England, DMFs were present in 34/69 children classified as "black", regardless of whether the child presented with AD. In children classified as "white", only 11/44 had DMFs regardless of AD diagnosis. When cases of AD were excluded, 25% of the white children and 49% of black children had DMFs (4). In a separate study evaluating the differences in prevalence of AD minor characteristics between African Americans and European Americans, African Americans were more likely to have extensor involvement along with diffuse xerosis, palmar hyperlinearity, and DMFs (5). Furthermore, in individuals with darker skin tones, DMFs may be of greater importance, as other characteristics such as erythema may be harder to recognize (5).

Life-threatening food allergies are rare, but represent serious sequelae associated with AD. DMFs can serve as a critically simple, easy-to-identify marker for AD and perhaps identify the condition before the presence of serious sequelae. DMFs may guide the clinician towards inquiring further about other AD-related symptoms, thus improving clinical assessment of a significant pediatric condition.

References:

1. Hanifin JM, Rajka G. Diagnostic features of atopic dermatitis. Acta Derm Venereol. 1980;92:44-7.
2. Graham F, Eigenmann PA. Atopic dermatitis and its relation to food allergy. Curr Opin Allergy Clin Immunol. 2020;20:305-10.
3. Nomura TN, Wu J, Kabashima K. Endophenotypic variations of atopic dermatitis by age, race, and ethnicity. J Allergy Clin Immunol. 2020;8:1840-52.

4. Boozalis E, Grossberg AL, Puttgen KB, Cohen B. Itching at night: A review on reducing nocturnal pruritus in children. Ped Dermatol. 2018;35:560-5.
5. William HC, Pembroke AC. Infraorbital crease, ethnic group, and atopic dermatitis. Arch Dermatol. 1996;132:51-4.

Rohan Shah, William C. Lambert, Robert A. Schwartz

Rutgers University-New Jersey Medical School, Newark, New Jersey, USA

Corresponding author:

Rohan Shah BA

Rutgers New Jersey Medical School

185 South Orange Avenue

Newark, New Jersey 07103

rs1520@njms.rutgers.edu

Received: December 29, 2022

Accepted: June 1, 2023