Progressive Symmetric Erythrokeratoderma

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Case Presentation:

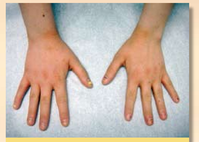

Figure 1

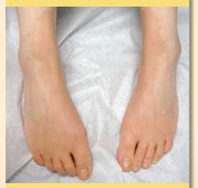

Figure 2

Figure 3

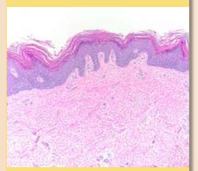

Figure 4
(H&E- 10X)

- **Patient:** S.D. is a 17 year-old Caucasian female.
- **History of Present Illness:** Patient presented to our office in 2002. The parents noted dry skin on the patient's arms and legs since a month after birth. Patient was not a collodion baby. Patient has noted progression of her dry skin over time and flaring in the spring.
- **Family History:** Paternal grandmother with similar skin findings.
- **Previous treatments:** Salicylic acid lotion, ammonium lactate lotion, urea cream
- **Current treatment:** Hydrocortisone/NaCl/ salicylic acid/eucerin compound
- **Physical Examination:** Pink to orange, polycyclic, keratotic plaques with slight scale on the dorsal feet, anterior legs, dorsal hands and extensor forearms. The face, trunk and buttocks are clear. There is also no involvement of the palms and soles. (Figures 1, 2 and 3)
- **Studies:** Loricrin gene test: pending
- **Biopsy:** CBL Path (D09NY1-0215286, 6/18/09) Left ankle: " Sections show skin with hyperkeratosis consisting of ortho- and parakeratosis, underlying acanthosis of the epidermis with some hypergranulosis, spongiosis, rare dyskeratotic keratinocytes, and an underlying superficial dermal mild perivascular lymphocytic inflammatory infiltrate." (Figure 4)

Discussion:

Progressive symmetric erythrokeratoderma (PSEK) was originally described by Darier in 1911. It is a very rare disorder of cornification with increased epidermal cell proliferation. It is a genetically heterogenous trait, but mostly autosomal dominant. Up to 40% of cases occur sporadically and it can also be autosomal recessive. Ishida-Yamamoto et al. detected a frameshift mutation in the loricrin gene on chromosome 1q in a Japanese family. Cui et al. excluded the loricrin gene as the responsible gene in a five-generation Chinese family. This family demonstrated a mutation on chromosome 21q11.2-q21.2, in an undetermined gene. Males and females are equally affected and only the skin is involved.

This disorder typically presents during infancy or early childhood with fixed, sharply demarcated, polycyclic, hyperkeratotic plaques on an erythematous base covered by a fine scale or with a rough, verrucous surface. The plaques are symmetric and involve the extensor surface of the extremities, buttocks and face. Typically, the trunk is spared. In most cases, the plaques are slowly progressive, increasing in number and size over time. They tend to stabilize after puberty and sometimes spontaneously resolve. Approximately 50% of patients may also have erythematous palmoplantar keratoderma.

Diagnosis of PSEK can be difficult due to the shared clinical and histopathological features with erythrokeratoderma variabilis (EKV). (Table 1) Clinically, in PSEK, the erythema underlies the fixed hyperkeratotic plaques, as opposed to the erythematous patches in EKV, which vary in size and location over minutes to days. However, palmoplantar keratoderma is more common in PSEK than EKV. Involvement of the thorax and abdomen is more common in EKV than PSEK. Both entities share non-specific histopathologic features including, basket-weave stratum corneum, hyperkeratosis with focal parakeratosis, follicular plugging, acanthosis of the epidermis, a prominent granular layer that may contain large polygonal clumps of keratohyaline and a sparse to moderate perivascular lymphocytic infiltrate. Electron microscopy and genetic testing can be used to definitively differentiate these entities.

Table 1

	PSEK	EKV
Location	Spares trunk	Thorax and abdomen
Erythematous Patches	Stable; underlying hyperkeratotic plaques	Variable size and location; minutes to days
Palmoplantar Keratoderma	50% of patients	Less common
Histopathology	Similar non-specific findings	Similar non-specific findings
Electron Microscopy	• Stratum corneum: lipid vacuoles • Swollen mitochondria coalescing in perinuclear location	• Papillary dermis: ↑ unmyelinated nerve fibers • Granular layer: ↑ keratinosomes
Genetics	Loricrin gene: chromosome 1q Unknown gene: chromosome 21q	Connexin genes GJB3-4: chromosome 1p34-35.1

Treatment can also be difficult for patients with persistent disease. Topical agents, which have proven to be minimally effective, include urea, α-hydroxy acids, propylene glycol, salicylic acid, coal tar and retinoids. Calcipotriol cream has also been used with unknown effectiveness. Systemically, isotretinoin, acitretin, etretinate therapy and oral psoralen-UV-A have been shown to be effective.

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