

JUVENILE PLANTAR DERMATOSIS

H. Neering and E. van Dijk

*Department of Dermatology, Free University Hospital,
De Boelelaan 1117, Amsterdam, The Netherlands*

Abstract. Juvenile plantar dermatosis seems to be a new skin disease found mainly in children between 3 and 14 years old. The main symptoms are: redness, shiny hyperkeratosis, lamellar scaling and painful fissure formation in the weight-bearing parts of the soles and toes. Sometimes the hands also seem to be affected. External factors, occlusive socks and footwear, possibly together with an atopic constitution, are believed to be the cause of the disease, which is very difficult to treat. The findings in 157 published and 23 own cases are discussed.

Key words: Plantar dermatosis; Children; Eczema; Footwear

Recently attention has been drawn to an apparently new skin disease, called *juvenile plantar dermatosis* by Mackie and Husain (1) and Millard & Gould (2), *recurrent juvenile eczema of hands and feet* by Schultz & Zachariae (4) and *atopic winter feet in children* by Möller (3). The clinical and epidemiological features of the published cases are strikingly the same, thus the existence of one disease may be assumed, although some aspects of this disorder are not agreed on. Histological investigations have not, yet been reported. We would like to comment on this new disease, summarizing the data of the previously published cases and our own observations in 23 patients.

PATIENTS

The clinical picture of the disease is fairly constant. The dermatosis is situated symmetrically on the pressure points of the feet, mainly the fore-feet and the toes. The lesions are red, especially on the margins and show some lamellar scaling; on soles the aspect is often of a shiny hyperkeratosis. Another feature is a more or less prominent fissure formation which may cause pain, the only complaint in those affected (Fig. 1). Four of our patients also showed the same lesions on the hands. In 2 of them the palms and volar aspects of the fingers were involved, in the other 2 it was mainly the fingers which were affected (Fig. 2). Histopathological investigation of the lateral side of a foot in a 13-year-old boy showed hyperkeratosis with localised parakeratosis, acanthosis and some spongiosis.

There was a slight dermal mononuclear perivascular infiltrate and edema, a picture consistent with (asteatotic) eczema (Fig. 3). The course of the disease is protracted and may last from months to several years. Sometimes a prolonged disease-free period is found. Seasonal influence was not uniform in our group of patients; in 2 of them the lesions were exacerbated during the winter; other children had skin complaints only in summer. The other features of our patients and of the other 157 published cases are compiled in Table 1.

DISCUSSION

The clinical picture is fairly constant in our patients and all other published cases. The disease characteristically occurs in boys and girls of school-age. Most of the children belong to the age

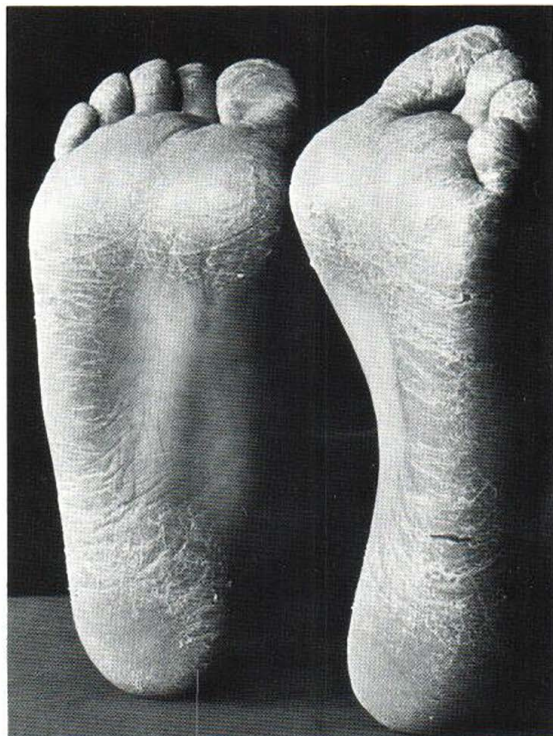


Fig. 1. Involvement of the feet in a 10-year-old girl.

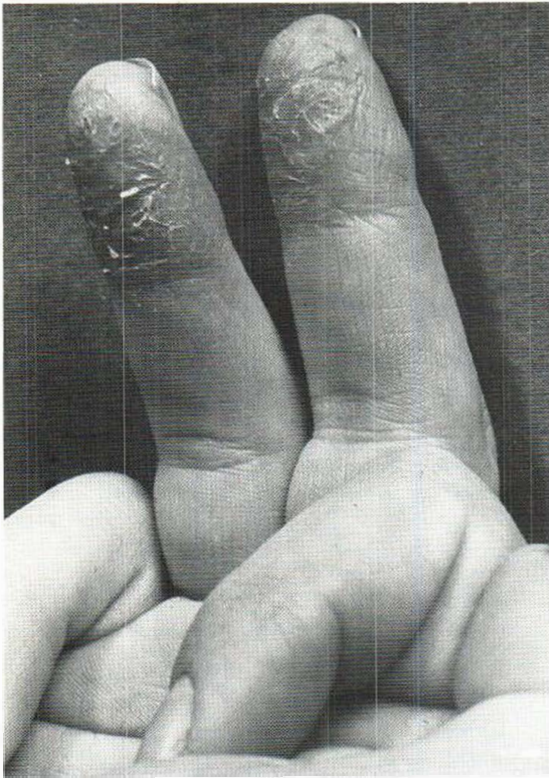


Fig. 2. Lesions on the distal volar parts of two fingers in a 13-year-old boy.

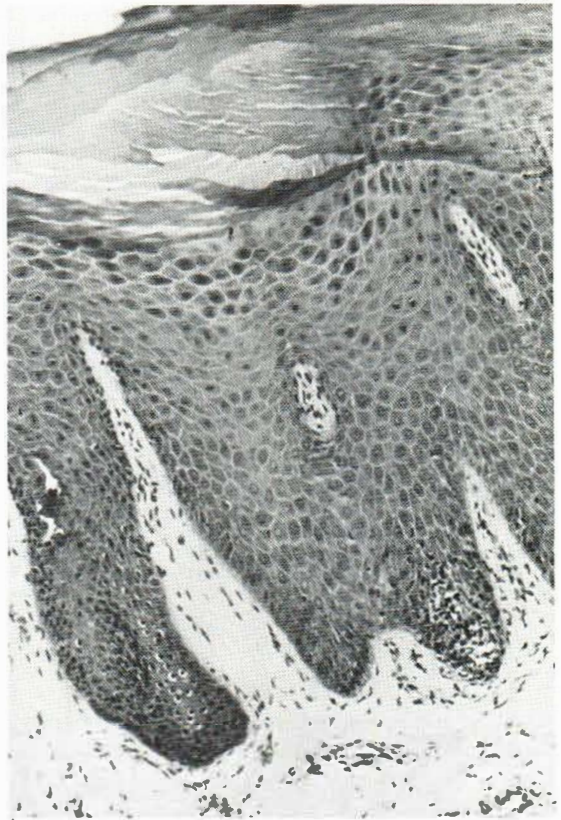


Fig. 3. Hyper- and parakeratosis, acanthosis, spongiosis, a slight mononuclear infiltrate and edema in the dermis, from a lesion of the foot of the same boy.

group 6–10 years. One report also mentions the occurrence of the same dermatosis on the hands: in the 21 patients of Schultz & Zachariae (4) all had palmar involvement. Of our patients, 2 showed the dermatosis of the hands, starting at the same time as the eruption on the feet; the other 2 showed the lesions on the hands 6 months and 5 years later than the lesions on the feet.

A mycotic infection and contact-allergy seem to be excluded as a cause of juvenile palmo-plantar dermatosis. Although some relevant positive patch tests were found, removal of these agents did not improve the condition (1).

The role of atopy appears to be highly controversial. While Schultz & Zachariae (4) and Mackie & Husain (1) could not find convincing evidence of atopy as a factor in the genesis of juvenile plantar dermatosis, the other authors consider a causal relationship to exist. Of the total of 157 cases published, and our 23 cases, 33 (18%) children had definite symptoms of atopic constitution and 37 of the first degree relatives had a history of atopy.

Compared with a control group of 100 "normal" children among whom 10 had a history of "atopy" (1), the difference is suggestive but not statistically significant. The definitions of atopy, however, may show a very considerable variation between the investigators. Additional tests corroborating the role of atopy, do not seem to have been helpful.

However, all authors seem to agree on the role of external factors in this disease. Hyperhidrosis exacerbated by occlusive socks containing synthetic fibres, and tight rubber shoes seem to trigger off the dermatosis. All modern socks seem partly to be made of synthetic fibres: in the Netherlands, nylon, acryl and polyamide are in use. Millard & Gould (2) stress the importance of a certain type of training shoe; other types of tight occlusive footwear such as tennis shoes, rubber boots etc. are in our view equally important. Sporting activities are frequently mentioned, but most children do sports nowadays, especially in schooltime. That occlusive footwear

Table 1. Summary of features of 180 cases of juvenile plantar dermatosis

	Möller 1972 (3.)	Schultz & Zachariae 1972 (4.)	Mackie & Husain 1976 (1.)	Millard & Gould 1977 (2.)	Present Cases 1978
<i>Number</i>	13	21	102	21	23
Boys + girls	7+6	13+8	55+47	11+10	17+6
Age (years)	6-14	7-15	2-14	2-16	3-14
<i>Localization</i>					
Feet	13	21	102	21	23
Hands	0	21	0	0	4
<i>Histopathology</i>	-	-	-	-	Eczema
<i>Mycology</i>	Neg.	Neg.	Neg.	Neg.	Neg.
<i>Relevant patch tests</i>	0/13	0/21	8/102	2/21	1/9
<i>Atopy (role of)</i>	Pos.	Neg.	Neg.	Pos.	Pos.
Patients	4/13	0/21	12/102	12/21	5/23
Relatives	7/13	6/21	11/102	14/21	9/23
Pos. Trifaril tests	-	3/21	2/20	-	-
Pos. white dermographism	13/13	-	-	-	-
Elevated IgE	-	-	1/20	-	-
<i>External factors</i>	Rubber shoes, nylon socks	Hyperhidrosis, heavy tight shoes, unhygienic conditions	Sports, boots, synthetic fibres in socks	Training shoes, sports, nylon socks	Sports, synthetic fabrics in socks
<i>Therapy</i>	Reacts favourably on several external factors			Hygienic measures, change of footwear. Lassar's paste	Difficult. Rest, changes of footwear

does indeed have an important bearing, is indirectly proven by the finding that sick children who had to stay in bed for a while, spontaneously recovered in a few days, only to have a relapse after resuming activities. The pathogenesis of the lesions of the hands is difficult to understand.

Therapy is very difficult. Steroid-containing preparations may give temporary improvement, as do several other aggressive or non-aggressive treatments. The advice to wear cotton socks, to observe careful hygienic measures and a timely change of footwear, seems to be the soundest advice at this stage of knowledge of the disease (2).

In conclusion we can say that juvenile plantar dermatosis seems to be a new entity, probably of multifactorial origin, in which external occlusive factors and perhaps atopy play an important role. The disease appears to be fairly common; it may be expected that further investigations will probably elucidate its pathogenesis.

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ADDENDUM

While this article was in print one recent paper on this subject was published (Verbov, J.: Atopic eczema localized to the forefoot. *The Practitioner* 220: 465, 1978) and two older ones were brought to our attention (Friis, B.: Dermatitis plantaris sicca bei Kindern. *Derm. Mschr.* 160: 614, 1974 and Enta, T.: Peridigital Dermatitis in Children. *Cutis* 10: 425, 1972). These papers describe a total of 179 cases, practically identical to juvenile plantar dermatosis.

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E. van Dijk, M.D.
Department of Dermatology
Free University Hospital
de Boelelaan 1117
Amsterdam
The Netherlands