

Juvenile Plantar Dermatoses: An Expression of Atopic Dermatitis¹

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= Abstract = Thirty patients with hands and feet eczema were evaluated with special reference to relationship with atopic dermatitis. To know the relationship we observed the basic and minor features of atopic dermatitis described by Hanifin in patients who visited our hospital with the chief complaints of eczema of hands and feet. Among the 30, 28 had basic features and 20 had minor features of atopic dermatitis.

It can be speculated that most patients with hands and feet eczema in children have an atopic constitution so that hands and feet eczema in children seems to be an expression of atopic eczema. Two of thirty patients did not have an atopic constitution and eczema in these patients might be distinct dermatoses which are not related with atopic dermatitis.

Key words: *Hands and feet eczema, Atopic dermatitis, Atopic constitution*

INTRODUCTION

Mackie and Husain (1976) have used the term juvenile plantar dermatosis as a distinct dermatosis of the forefoot occurring especially in school age. Attention had been drawn to characteristic dermatosis called juvenile plantar dermatosis, recurrent juvenile eczema of hands and feet (Schultz and Zachariae 1972) and atopic winter feet in children (Moller 1972) which are used synonymously. Because none of the patients had had a previous episode of skin disease nor was there a history of ichthyosis, psoriasis or atopic eczema in their relatives these dermatoses were considered as distinct from atopic dermatitis.

The cause of juvenile plantar dermatosis is still not settled. It has been suggested that the condition is a frictional contact dermatitis caused in part by the synthetic material of shoes and

socks. According to Jones *et al.* (1987) after longerm follow-up, there is an increased prevalence of atopy. Verbov (1978) is of the opinion that juvenile plantar dermatosis is an expression of atopic eczema.

In order to find the possible association with atopy a study to observe the clinical features of atopic dermatitis (Hanifin 1983) in hands and feet eczema patients was undertaken.

MATERIALS AND METHODS

Thirty patients were selected among the patients visiting Seoul National University Children's Hospital with the chief complaint of hands and feet eczema. To evaluate the possible association with atopy, the patients who had typical atopic dermatitis with hands and feet eczema were excluded. The patients who had mild atopic eczema disclosed by close physical examination were included.

The patients were divided into two groups, with or without atopic dermatitis. Basic features and minor features of atopic dermatitis (Hanifin 1983) were examined in two group separately. Contact dermatitis and fungal infection were ex-

Received 25/3/89; revised 16/5/89; accepted 23/5/89

¹This work was supported by a clinical research grant of Seoul National University Hospital (1988).

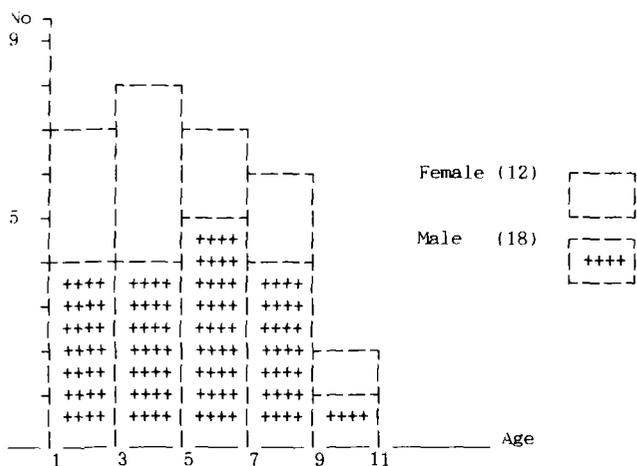


Fig. 1. Age and Sex of hands and feet eczema patients.

cluded by the patch test and fungus examination.

RESULTS

Of the 30, 18 were male and 12 were female. Mean age is 5.7 years (male: 5.8 years, female: 5.5 years)(Fig. 1). Mean duration of illness was 3.4 years (male: 3.7 years, female: 2.9 years-)(Fig. 2). Site of hands and feet eczema were toes, forefoot and fingertips in decreasing order in frequency (Table 1). Atopic dermatitis was associated in 17 patients.

Among the basic features of atopic dermatitis pruritus was found in 26 (86.7%). Five patients (16.7%) had personal history including asthma and allergic rhinitis. Family history was found in 10 patients (33%) (Table 2).

Among the minor features of atopic dermatitis, xerosis was found in 18 (60%). Ten patients (33.3%) had chelitis (Table 3).

There was seasonal variation in 20 patients (66.6%). Fourteen patients (46.7%) complained of excessive sweating (Table 4).

There were two cases without any features of atopic dermatitis. Patch test done in two cases and fungus examination in three cases were negative.

DISCUSSION

Juvenile plantar dermatosis is characterized by a shiny, smooth appearance of the weight bearing areas of the feet with subsequent fissuring of the skin folds between toes and ball of the

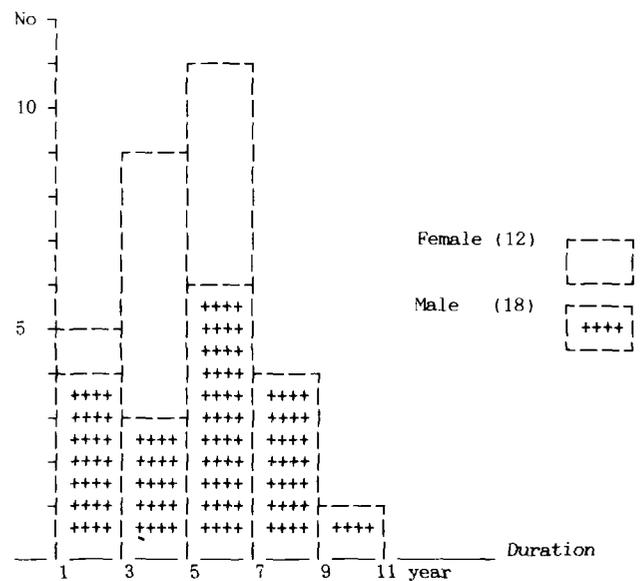


Fig. 2. Duration of hands and feet eczema.

Table 1. Areas involved in 30 patients

Areas	Male	Female	Total
Forefoot	10 (55.6)	4 (33.3)	14 (46.7)
Toes	9 (50)	6 (50)	15 (50)
Heel	8 (44.4)	2 (16.7)	10 (33.3)
Lateral margin of sole	10 (55.6)	2 (16.7)	12 (40)
Instep	3 (16.7)	2 (16.7)	5 (16.7)
Dorsum of foot	4 (22.2)	3 (25)	7 (23.3)
Fingertip	10 (55.6)	4 (33.3)	14 (46.7)
Palm	7 (38.9)	4 (33.3)	11 (36.7)
Total	18 (100%)	12 (100%)	30 (100%)

feet. The name juvenile plantar dermatosis has gained generalized acceptance. Recurrent juvenile eczema of hands and feet (Schulz and Zachariae 1972) and atopic winter feet in children (Moller 1972) are used to describe this characteristic dermatosis.

In the present study, the mean age was 5.7 years and the duration of illness was 3.4 years. These results confirm the widely held view that juvenile plantar dermatosis is a chronic disease of childhood. Those of Jones *et al.* (1987) (mean age of onset: 7.3 years, duration of illness: 8.4 years) also support this view.

The condition is most intense over the ball of the great toe, spreading posteriorly to involve the ball of the foot and occasionally the heel

Table 2. Basic features in patients with hands and feet eczema

Basic features	Patients with atopic dermatitis	Patients without atopic dermatitis	Total
Pruritus	16 (94.1)	10 (76.9)	26 (86.7)
Flexural lesion	7 (41.2)	0 (0)	7 (23.3)
Facial lesion	6 (35.3)	0 (0)	6 (20)
Personal history of atopy	2 (11.8)	3 (23.1)	5 (16.7)
Family history of atopy	6 (35.3)	4 (30.8)	10 (33.3)
Personal or family history of atopy	8 (47.1)	5 (38.5)	13 (43.3)
Total	17 (100%)	13 (100%)	30 (100%)

Table 3. Minor features in patients with hands and feet eczema

Minor features	Patients with atopic dermatitis	Patients without atopic dermatitis	Total
Xerosis	13 (76.5)	5 (38.5)	18 (60)
Ichthyosis	5 (29.5)	1 (7.7)	6 (20)
Palmar hyperlinearity	4 (23.5)	3 (23.1)	7 (23.3)
Keratosis pilaris	4 (23.5)	2 (15.4)	6 (20)
Cutaneous infection	2 (11.8)	1 (7.7)	3 (10)
Cheilitis	7 (41.2)	3 (23.1)	10 (33.3)
Anterior neck fold	3 (17.6)	0 (0)	3 (10)
Dennie Morgan fold	2 (11.8)	1 (7.7)	3 (10)
Facial pallor	1 (5.9)	0 (0)	1 (3.3)
Pityriasis alba	1 (5.9)	1 (7.7)	2 (6.7)
Total	17 (100%)	13 (100%)	30 (100%)

Table 4. Associate factors in patients with hands and feet eczema

Associate factors	Patients with atopic dermatitis	Patients without atopic dermatitis	Total
Itching	10 (58.8)	3 (23.1)	13 (43.3)
Wool intolerance	9 (52.9)	1 (7.7)	10 (33.3)
Food intolerance	4 (23.5)	1 (7.7)	5 (16.7)
Emotional factors	2 (11.8)	0 (0)	2 (6.7)
Seasonal variation	13 (76.5)	7 (53.8)	20 (66.8)
Hyperhidrosis	7 (41.2)	7 (53.8)	14 (46.7)
Like water play	2 (11.8)	2 (15.4)	4 (13.3)
Absent	2 (11.8)	4 (30.8)	6 (20)
Total	17 (100%)	13 (100%)	30 (100%)

(Ashton *et al.* 1985). This study also shows that the common sites of involvement are toes, fore-foot and heel. Frequent involvement of pressure site suggest that this condition is caused in part

by friction.

Neering and Van Dijk (1978) found fingertip involvement in four of 23, Enta (1972) in nine of 52. In the present study fingertip involvement

was also frequent (46.7%). Presence of hand involvement and the presence of changes at non-frictional sites argues against a causal role for footwear in the etiology of this condition (Mackie 1982).

Mild atopic dermatitis was found in 17 patients among those who complained only hands and feet eczema. This finding suggests that hands and feet eczema is a frequent expression site of atopic dermatitis.

Among the basic features of atopic dermatitis, pruritus was found in 26 (86.7%), personal history of atopy in 5 (16.7%) and family history of atopy in 10 (33.3%). Groups without atopic dermatitis had similar rate of personal and family history of atopy compared to groups with atopic dermatitis.

These findings suggest that hands and feet eczema in children who do not have atopic dermatitis also have similar atopic constitution compared to the group with atopic dermatitis.

Most common minor features were xerosis (60%), cheilitis (33.3%) and palmar hyperlinearity (23.3%). The group without atopic dermatitis had xerosis in 5 (38.5%), cheilitis in 3 (23.1%) and palmar hyperlinearity in 3 (23.1%). Although the incidence of some basic features was low in groups without atopic dermatitis, 17 minor features were found in 13 patients. This study shows that the majority of patients with hands and feet eczema had numerous basic and minor features of atopic dermatitis even if they were not associated with atopic dermatitis.

It was suggested that the juvenile plantar dermatosis is an expression of atopic dermatitis (Verbov 1978). Author's results also suggest that most of the hands and feet eczema patients have atopic constitution and this eczema may be an expression of atopic dermatitis.

The cause of this eczema is not settled but Shrank (1979) demonstrated features of miliaria in juvenile plantar dermatosis. He suggested that the use of impermeable non-absorbent synthetic materials such as plastics and fabrics impregnated with rubber or polyvinyl chloride (PVC) in the shoe may have been the precipitating factors together with friction in this condition.

From the history of the hands and feet eczema patients, a high rate of hyperhydrosis (46.7%) and seasonal variation (66.8%) was

found.

It is suggested that the condition is related to the synthetic material that has become ubiquitous in footwear during the last few decades. The high rate of hyperhydrosis in these patients suggests that hyperhydrosis is also a precipitating and triggering factor which acts as a cofactor with the synthetic materials of socks and shoes.

Although juvenile plantar dermatosis has gained generalized acceptance, it is not appropriate because of the frequent involvement of fingertips. Atopic winter feet is also commonly used, but it has too strict a limitation when considering seasonal variation. The results of this study show most patients are an expression of atopic eczema, so juvenile plantar dermatosis as a distinct disease entity seems controversial.

Among the 30 patients, none of the basic and minor features of atopic dermatitis were found in 2. There a small parts of these eczema patients did not have an atopic constitution. Further follow up is needed for confirmation.

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= 국문초록 =

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1987년 11월부터 1988년 4월까지 서울대병원 소아피부과를 방문한 소아의 수부 및 족부 습진 환자를 대상으로 조사한 결과 30명 중 28명에서는 소양증을 포함하여 아토피의 가족력 등 아토피 피부염의 기본증상을 관찰할 수 있었으며 20명에서는 건조증 등 아토피 피부염의 부증상을 볼 수 있었다. 따라서 대부분의 환자에서 아토피의 체질이 동반되어 있음을 보여 주었으며 이러한 체질과 다한증 및 기타 외부인자가 복합적으로 작용하여 증상을 유발할 것으로 생각되고 일부의 환자에서는 전혀 아토피의 증상이 발견되지 않아 아토피와는 관계없는 다른 유형의 피부염일 가능성을 보여 주었다.