

## CLINICAL REPORT

# Palmoplantar Lesions in Psoriasis: A Study of 3065 Patients

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Although palmoplantar psoriasis can be severely disabling, there are very few large clinico-epidemiological studies on this condition. Our purpose was to study the morphology and pattern of lesions in Indian patients with palmoplantar psoriasis and to elucidate the role of occupation in the incidence/localization of these lesions. All patients attending our Psoriasis Clinic from 1993 to 2000 were screened for palmoplantar lesions and their demographic characteristics, occupation and the exact localization of the lesions were noted. Out of 3,065 patients screened, 532 had palm and/or sole involvement. Plantar lesions were seen in 91.9% and palmar lesions in 55.6% of these patients. Four distinct patterns of lesion localization were noted on the palms and 5 patterns on the soles. Almost half of the men involved in regular manual labor had palmar lesions restricted to areas exposed to pressure, whereas only a quarter of other men had this type of lesion pattern. All patients with unilateral palmar lesions had them on their dominant hand and these patients were involved in regular manual labor. In our patients, the prevalence of plantar lesions was much higher than that of palmar lesions. The possible role of occupational trauma in lesion localization in Indian patients with palmoplantar psoriasis is discussed. **Key words:** *Koebner's phenomenon; occupational dermatoses.*

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Palmoplantar lesions in patients with psoriasis often occur along with psoriasis elsewhere on the body and less commonly in isolation. By virtue of its cosmetic and occupational impact, palmoplantar psoriasis (PP) can be particularly disabling even though it involves a relatively small percentage of the body surface area (1). Although the morphology of PP is often typical – “sharply demarcated, red scaling plaques that stop at the palm-wrist junction” (2) – the diagnosis can be difficult in atypical cases. Lesions may be unilateral, may appear as small, hard keratotic nodules, linear plaques or resemble palmoplantar keratoderma (2). Pustular lesions may present as acute or chronic palmoplantar pustulosis or acrodermatitis continua.

The pathogenesis of PP and factors affecting the frequency and localization of lesions remain poorly understood. Holding a tennis racquet, baseball bat or hammer has been reported to induce lesions on the palms, and trauma due to boots during strenuous activity can cause plantar lesions (3, 4). The irritant effects of soaps and detergents (1), and smoking (5) have also been cited as determining factors in causing this condition.

There are few clinico-epidemiological studies on PP. In most reports, only the prevalence of PP is noted as part of a larger study on psoriasis (6–9). In this study, we have tried to define the various clinical presentations of PP and their relative frequency in patients attending our Psoriasis Clinic. By mapping the individual lesions over various parts of the palm and sole, we have also attempted to elucidate the role of the Koebner phenomenon in the anatomical localization of palmoplantar lesions. Occupational exposure to friction/manual labor and its relation to PP have also been investigated.

## MATERIAL AND METHODS

The study population comprised all patients registered ( $n = 3,065$ ) at the Psoriasis Clinic of the Postgraduate Institute of Medical Education and Research, Chandigarh, from 1993 to 2000. The Institute is a tertiary-level referral center in North India and serves a mixed urban–rural population of 5 neighboring states. The whole body was examined for the presence of lesions of psoriasis and those who had involvement of the palms and/or soles were included in the study. Patients were included irrespective of age, sex, and duration of disease, or occupation. Patients with involvement of palms and soles as part of extensive psoriasis (> 30% body surface area), erythroderma or generalized pustular psoriasis were excluded from the study. The patients were divided into two groups according to occupation: those who were regularly involved in heavy manual work, e.g. construction workers, farm laborers, etc., and those who did other work not involving manual labor, e.g. office workers, shopkeepers, etc. Women were classified as those doing only household work and those with other occupations. The pattern of lesions over both palms and soles was recorded diagrammatically for each patient. Associated symptoms, if any, were also noted. In patients with unilateral/asymmetrical lesions or involvement of interdigital spaces, a potassium hydroxide preparation was examined for the presence of dermatophytes. If positive, the patients were excluded from the study. In the case of doubtful lesions, a senior dermatologist (BK or IK) confirmed the diagnosis. In a few patients, a skin biopsy was carried out to confirm the diagnosis.

The Z-test was used to calculate the difference between proportions.

## RESULTS

A total of 3,065 patients with psoriasis (1,692 males and 1,373 females aged  $35.9 \pm 9.8$  years, ranging from 6 to 73 years) were screened during the 8-year study period. Palmar or plantar lesions were present in 540 (17.6%) of these patients. A skin biopsy in 28 (5.2%) patients revealed that 8 patients had hyperkeratotic eczema. Thus, 532 (17.4%) (282 males and 250 females) patients were diagnosed with palmar and/or plantar psoriasis. The sex ratio of these patients was not significantly different from the overall patient population in the clinic ( $Z=0.85$ ,  $p>0.10$ ). As shown in Table I, PP was the most common diagnosis in 253 (47.5%) patients, followed by plantar psoriasis in 236 (44.3%) and palmar psoriasis in 43 (8.1%) patients. When data for males and females were segregated, it was seen that isolated palmar involvement was significantly more common in men in comparison with women. Involvement of both palms and soles and involvement of only the soles with psoriasis were not significantly different between the sexes (Table I). Out of 15 (2.8%) patients with pustular lesions, 4 had acrodermatitis continua of Hallopeau and 11 had palmoplantar pustulosis.

Typical psoriatic lesions elsewhere on the body were present in only 30.3% of the 532 patients; 94% had plaque-type psoriasis, 4% had scalp lesions and 2% had plaques with lesional pustulation. Palms/soles were the first sites of appearance of lesions in 21% of these patients. The details of localization of lesions over the palms and soles, which were available in 260/296 patients with lesions on the palms and 463/489 patients with plantar lesions, are listed in Table II. Four distinct patterns were seen on the palms and 5 on the soles, diffuse involvement sparing the instep being seen only on the soles. The most common pattern on the palms was of plaque-type lesions situated only over pressure-bearing areas. On the soles, discrete plaques distributed randomly all over were the predominant type of involvement.

Extension of lesions beyond the wrist and to the dorsa of hands was seen in 112 (43.1%) of the patients with palmar lesions. In 136 (27.8%) patients with plantar

Table I. Localization and distribution patterns of psoriatic lesions in relation to sex

	Males (n = 282)	Females (n = 250)	Sex ratio (1.13:1)
Localization			
Palms	163	133	1.22:1
Soles	253	236	1.07:1
Distribution			
Palmoplantar	134	119	1.13:1
Plantar	119	117	1.02:1
Palmar*	29	14	2.07:1

\* $p<0.05$  for difference between sexes.

Table II. Patterns of palmoplantar involvement in 532 patients

	Palms (n = 260)	Soles (n = 463)
(i) Pressure/weight-bearing areas*	84 (32.3%)	112 (24.2%)
(ii) Non-pressure bearing areas**	75 (28.8%)	140 (30.2%)
(iii) Discrete lesions over both (i) and (ii)	58 (22.3%)	151 (32.6%)
(iv) Diffuse (keratoderma-like)	43 (16.5%)	46 (9.9%)
(v) Diffuse, sparing instep	–	14 (3%)

\*Thenar and hypothenar eminences, margins of hand and volar aspect of fingers for palms; heel, forefoot, lateral border, plantar surface of toes for soles.

\*\*Hollow of palm, instep of sole.

lesions, there was extension of psoriatic lesions to the dorsa of the feet. Interdigital space was involved in 21 (4.5%) patients with plantar (Fig. 1) and 9 (3.5%) with palmar lesions. Linear crateriform lesions on the margins of the hands were seen in 3 patients, which we have reported earlier (10).

Out of 282 men, 115 (40.8%) were judged to be involved in regular manual labor on the basis of their occupation. Out of these, 68 (59.1%) had lesions on the palms with or without plantar involvement. Out of 167 men who were not involved in manual labor, 95 (56.9%) had palmar lesions. This difference was not statistically significant ( $p>0.10$ ). However, when we looked at the exact localization of lesions in these two groups (Table III), 47% of the palmar lesions in manual laborers were restricted to pressure-exposed areas versus only 25.3% in men with other types of occupation ( $p<0.01$ ). Diffuse involvement of the palms was significantly more common in men who were not manual workers ( $p<0.001$ ). All other patterns did not show any significant difference between the two groups.

Unilateral involvement of the palm was seen in 10 (3.8%) patients and the sole in 17 (3.7%) patients. All 10 patients with unilateral palmar involvement were men and had lesions over the dominant (right) hand. Eight of these patients were manual laborers and two were motor mechanics. In contrast, unilateral plantar lesions were almost equally distributed (8 right, 9 left)



Fig. 1. Interdigital lesions on the toes.

and had no gender predilection (10 males, 7 females) or occupational bias.

Three hundred and ninety-two (73.7%) patients complained of itching and/or discomfort during walking owing to irregular thickening of the soles, excessive sweating (in those wearing shoes) and fissuring (Fig. 2). Palmar lesions, for example keratoderma-like problems (Fig. 3), reduced the mobility of the fingers and made the performance of household chores difficult. Fissuring of the palms and soles, in addition to being painful, often resulted in secondary infection.



Fig. 2. Fissuring over lesions localized to heels. Note the pustular lesions on the right side.



Fig. 3. Diffuse keratoderma-like lesions.

## DISCUSSION

The prevalence of psoriasis of the palms and soles varies widely in different studies, ranging from 2.8% (6) to 40.9% (9). Our point-prevalence rate of 17.4% is within this range and is similar to the previously reported figures from this region (11).

Almost 70% of the patients in our study had isolated palmar and/or plantar psoriasis without lesions elsewhere. This may reflect a high incidence of “pure” palmoplantar disease, or the longer persistence/refractory nature of lesions at these sites. In the rest of the patients, palms/soles were the first sites of onset of psoriasis in 21%, which is comparable to previous figures reported from our center (12). Plantar involvement in our patients was much more common than palmar involvement (91.9% vs. 55.6%), which coincides with our previous study on childhood psoriasis (12), but is in contrast to studies from the USA, Sweden and the Faroe Islands (6–9) where roughly equal incidence was found for both palmar and plantar lesions. However, the dictum that lesions of PP are almost always bilateral was well illustrated in our study, with 96.3% of patients showing this pattern.

The high prevalence of plantar involvement may be due to the Indian custom of walking either barefoot or wearing open slippers most of the time. Since the relative motion of the foot against a slipper is higher than in a shoe, minor trauma is much more likely. This may point to the role of Koebner’s phenomenon in the causation of plantar psoriasis.

Regarding palmar lesions, although regular manual laborers did not have a higher prevalence than other men, almost half of them had lesions confined to the pressure/friction-exposed areas on the palms compared with only a quarter of other men. Furthermore, diffuse palmar lesions were almost 5 times rarer in laborers than in other men (Table III). These observations suggest that friction may play a role in localizing the lesions over certain areas in patients with pre-existing PP. The presence of unilateral palmar lesions on the dominant hand exclusively in men engaged in manual work also points to this suggestion.

Table III. Pattern of psoriatic lesions in men engaged in regular manual labor vs. other men

	Palms		Soles	
	Laborers (n = 68) n (%)	Others (n = 95) n (%)	Laborers (n = 101) n (%)	Others (n = 152) n (%)
(i) Pressure/weight-bearing areas	32 (47)*	24 (25.3)*	28 (27.7)	35 (23)
(ii) Non-weight-bearing areas	14 (20.6)	21 (22.1)	29 (28.7)	49 (32.2)
(iii) Discrete lesions over both (i) and (ii)	19 (27.9)	31 (32.6)	36 (35.6)	52 (34.2)
(iv) Diffuse	3 (4.5)**	18 (18.9)**	4 (4)	11 (7.2)
(v) Diffuse, sparing instep <sup>#</sup>	–	–	4 (4)	5 (3.3)

\* $p < 0.01$ ; \*\* $p < 0.001$ .

<sup>#</sup> Not seen on palms.

Although lesions on the palms did not reveal a predilection toward a particular gender, involvement of only the palms was significantly more common in men (Table I). For women with isolated palmar lesions, all 14 in this group were housewives. The significance of this figure may be diminished somewhat by the overwhelming preponderance of housewives among the women in our sample, but compared with women working in offices, housewives performed heavier duties, washing clothes and handling heavy utensils in the kitchen.

The findings in this study indicate that friction and pressure might induce or perpetuate lesions of PP. Definite proof can only be obtained by a clear history of appearance or aggravation of PP by physical activity such as running and exercising. Mier & van de Kerkhof (13) have reported that occupational exacerbation was seen in up to 40% of patients with PP. We cannot comment on this figure based on our data as we have noted only the nature of work and localization of lesion, and a detailed inquiry of exacerbating or causative factors was not undertaken.

Extension of lesions to the dorsa of the palms and fingers and beyond the wrist in more than 40% of patient is at odds with a previous report (2). The involvement of the web spaces of the toes in 4.3% patients with plantar lesions and in 3% of those with palmar psoriasis was also a somewhat surprising finding. It is possible that this localization is a result of Koebnerization due to rubbing/scratching a pre-existing symptomatic intertrigo or interdigital maceration caused by prolonged soaking of the feet. The friction produced by the strap between the first and second toes by Hawaiian slippers commonly worn by Indians, may also be responsible for this finding.

PP can cause severe physical and psychological disability that is disproportionate to the relatively small body surface area involved. Almost three-quarters of our patients presented with symptoms of itching and/or discomfort in performing daily activities.

In conclusion, this study reveals the high incidence of

isolated palmoplantar psoriasis and involvement of the soles in Indian patients with PP compared to patients from other societies. This may be the result of friction/pressure, or due to genetic differences in Indian psoriatics.

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