

Clinicopathological Study of Hyperkeratotic Lesions of Palms and Soles: An Observational Study

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Abstract

Introduction: Hyperkeratotic, fissure-prone, infiltrated lesions over the palms and soles is a very common skin condition. These conditions, do not always present with typical manifestations, such as classical skin lesions and nail changes and therefore known clinical features about these diseases might not be helpful in diagnosis. Thus this study was conducted to study the clinical and histopathological features of hyperkeratotic lesions of palms and soles and to correlate them clinically.

Materials and Methods: The study was conducted in outpatient Department of Dermatology, Venereology & Leprology, Mahatma Gandhi Medical College & Hospital, Jaipur. 100 consecutive cases of hyperkeratotic lesions of palms and soles presenting from November 2010 to October 2013, were included in the study. The cases included were, psoriasis of palms and soles, Hyperkeratotic eczema and Tinea pedis and tinea manuum (Hyperkeratotic variety).

Results: The data was analysed under following categories; age incidence, incidence in relation to sex, incidence of duration of the disease, incidence of seasonal variation of the disease, incidence of presence or absence of itching, symmetry of the disease, incidence of involvement of nails. Histopathological analysis was done on basis of; degree of hyperkeratosis, degree of parakeratosis, degree of acanthosis, degree of spongiosis, presence of Munro's microabscesses, presence of Pustule of Kogoj, presence of supra-papillary thinning in stratum malpighium, degree of elongation of rete ridges, degree of elongation of papillae and clubbing of papillae, degree of exocytosis, type of infiltrate in the dermis, type of infiltrate around blood vessels. Special investigations conducted were positivity of skin lesion for fungus by KOH examination, Positivity of nail for fungus by KOH examination, results of pus for culture and sensitivity, PAS positive fungal cases.

Conclusion: Thus from the present study of 100 cases of hyperkeratotic lesions of palms and soles it can be concluded that: classical clinical and histopathological features are seen in most of the cases. Cases in which they are absent, skin biopsy and special investigations has to be done to aid in diagnosis. There is a considerable overlap in clinical and histopathological feature of these conditions and the sensitivity and specificity of special tests is low. Thus a clinicopathological correlation is required for appropriate diagnosis. This would help in a better management of patients.

Keywords: hyperkeratotic lesions of palms and soles, clinicopathological correlation, palmoplantar psoriasis, hyperkeratotic eczema, hyperkeratotic tinea pedis, hyperkeratotic tinea manuum

INTRODUCTION

Hyperkeratotic, fissure-prone, infiltrated lesions over the palms and soles is a very common skin condition. Such cases are frequently encountered by us in our outpatient department. The common skin conditions associated with such lesions are psoriasis, eczematous dermatitis, neurodermatitis, keratodermas, fungal infection, dishidrotic eczema, numular eczema and -id reactions.¹ Out of these, the most commonly encountered are; palmar and plantar psoriasis, hyperkeratotic eczema and hyperkeratotic Tinea pedis and Tinea manuum.

These conditions do not always present with typical manifestations, such as classical skin lesions and nail changes and therefore known clinical features about these diseases might not be helpful in diagnosis. This fact is sustained by many authors, e.g., Matsunaga J. et al (1998),² who stated that, the morphology of hand psoriasis is often typical, but sometimes it has eczematous features posing diagnostic problems. In a study of 154 cases by Sujay Khandpur et al (2011),³ hyperkeratotic eczema has been found challenging to distinguish and may overlap with psoriasis, although it usually does not have the degree of erythema or the well-demarcated

nature of psoriasis. Hyperkeratosis over the knuckles favors psoriasis. Diagnosis can be aided by skin biopsy, patch test, KOH mount or fungal culture. Patch test is a useful diagnostic method to differentiate hyperkeratotic eczema from palmoplantar psoriasis and Tinea manuum and Tinea pedis. The rate of positivity of patch test has ranged from 46.7% to 82%.^{4,6} Contact allergy may occur in patients with psoriasis, Angelini et al. (1987)⁷ found that 3.2% psoriatic patients had positive patch test results, while Barile et al. (1996)⁸ in 24% were positive. Thus patch testing might lead to misdiagnosis of hyperkeratotic lesions alone cannot be used for this purpose. Tinea manuum and Tinea pedis are generally unilateral (Sujoy Khandpur et al, 2011)³ are easy to diagnose. However, chronic hyperkeratotic contact dermatitis can also be unilateral, while Tinea manuum and Tinea pedis may be bilateral. KOH mount and/or fungal culture can be used to differentiate these conditions. The different sensitivity rates reported for KOH mount have ranged from 32% to 80 %, while the specificity has been reported to be 40%.⁹⁻¹¹ Thus it is not a very useful test for diagnosis of T. manuum and T. pedis due to low specificity. This leaves skin biopsy as an important adjunct in reaching a diagnosis. The histopathology of psoriasis of palms and soles has been described by Vanscott EJ et al,¹² while that of hyperkeratotic tinea by Kligman A M, et al.¹³ Hyperkeratotic eczema has been studied by Agrup G,¹⁴ and Hersle & Mobacken.¹⁵ A detailed histopathology might therefore be quite helpful in differentiating these three clinically confusing but discrete conditions. This is likely to have a major impact on the therapeutic approach, and consequently on the prognosis. This study was conducted to try to correlate the clinical findings with the corresponding histopathological features, so as to find out whether histopathology would aid in better diagnosis.

MATERIALS AND METHODS

The study was conducted in outpatient Department of Dermatology, Venereology & Leprology, Mahatma Gandhi Medical College & Hospital, Jaipur. 100 consecutive cases of hyperkeratotic lesions of palms and soles presenting from November 2010 to October 2013, were included in the study. All the cases having congenital hyperkeratosis were excluded in the study. The cases included were, psoriasis of palms and soles, Hyperkeratotic eczema and Tinea pedis and tinea manuum (Hyperkeratotic variety). Complete clinical history and physical examination were recorded on the attached proforma. The parameters included age, sex, duration, seasonal variation, presence or absence of itching, symmetry of disease and associated nail involvement. Skin scrapings and nail clippings for dermatophyte infection were taken in all cases where scaling

was prominent. Skin scrapings were kept in 10% KOH for 5-10 minutes and nails were kept in 40% KOH for 24 hrs before analysis. Culture was done in KOH negative cases on Sabouraud's dextrose agar medium. Skin biopsy for histopathology was done in all cases after taking the consent of the patient. An elliptical skin biopsy was taken after giving local anesthesia by infiltrating 2% xylocaine. Culture was done in KOH negative cases on Sabouraud's dextrose agar medium. Skin biopsy for histopathology was done in all cases after taking the consent of the patient. An elliptical skin biopsy was taken after giving local anesthesia by infiltrating 2% xylocaine.

RESULTS AND DISCUSSION

In the present study of 100 cases, 63 (63%) were males and 37 (37%) were females. Out of 100 cases, 37 were of palmar and plantar psoriasis, 15 of Tinea and 48 were of Hyperkeratotic eczema. Out of 37 cases of palmar and plantar psoriasis 21(56.76%) were males and 16(43.24%) were females. In Tinea, out of 15 cases, 9 (60.00%) were males and 6 (40.00%) were females.

Age Distribution

In palmar and plantar psoriasis 18.92% of cases belonged to the age group 21-30 years and 45.95% of cases belonged to 31-40 years age group. In Tinea pedis and manuum, 46.67% of cases belonged to 21-30 years age group, 26.67% belonged to 31-40 years age group and 20% belonged to 41-50 years age group. In Hyperkeratotic eczema, 43.75% of cases belonged to 31-40 years age group, 29.17% belonged to 41-50 years age group. So, it appears that psoriasis of palms and soles, hyperkeratotic eczema and tinea pedis and manuum, all seem to be more prevalent in middle aged adults.

Incidence in Relation to Sex

Out of 37 cases of palmar and plantar psoriasis, 21 (56.76%) were males and 16 (43.24%) were females. In Tinea Pedis and manuum, out of 15 cases, 9 (60%) were males and 6 (40%) were females. In Hyperkeratotic eczema, 33 (68.75%) were males and 15 (31.25%) were females out of 48 cases. Thus from the present study it can be seen that in palmar and plantar psoriasis there was predominance of males with M:F of 1.31:1, in Tinea pedis and manuum there was predominance of males with M:F ratio of 1.5:1 and in Hyperkeratotic eczema also there was predominance of males with M:F ratio of 2.2:1.

Duration of Disease

In Palmar and Plantar psoriasis 24.32% of cases had duration of less than 6 months and 35.14% had duration of disease varying from 1.5-2 years. In Tinea Pedis and manuum 80% of cases had duration of disease less

than 6 months, while remaining had duration less than a year. In Hyperkeratotic eczema 47.92% of cases had duration of less than 1.5 years and 43.75% had duration varying from 3-10 years. So it can be concluded from the above study that in palmar and plantar, either they were of less than 6 month duration or chronic, i.e., 1.5-2 years. Tinea Pedis and manuum present early as maximum cases were of less than 6 months duration. Again in Hyperkeratotic eczema, patient presented both early and late.

Seasonal Variation of the Disease

Out of 37 cases of palmar and plantar psoriasis 16 (43.24%) had seasonal variations with aggravation in winters. In Tinea Pedis and manuum out of 15 cases, 2 (13.33%) had seasonal variation, with exacerbation in summers and in Hyperkeratotic eczema 27 (56.25%) showed seasonal variation out of 110 cases with 6.25% having in summers and 50% in winters. In Palmar and plantar psoriasis and in Hyperkeratotic eczema there was aggravation of disease in winters, whereas in Tinea Pedis and manuum there was worsening in summer.

Presence or Absence of Itching

In Palmar and plantar psoriasis 29.73% patients complained of itching, in Tinea pedis and manuum 93.33% had itching and in Hyperkeratotic eczema out of 85.42% complained of itching. Thus it can be concluded that itching, is more common in dermatophyte infection and Hyperkeratotic eczema as compared to psoriasis of palms and soles.

Symmetry of the Disease

In Palmar and Plantar psoriasis 94.59% cases were bilateral, out of which 80 % were bilaterally symmetrical, while 20% were bilaterally asymmetrical. In Tinea pedis and manuum out of 15 cases, 93.33% were unilateral only 1 case was bilateral. In Hyperkeratotic eczema all the 89.58% cases were bilateral, with 72.09% being bilaterally symmetrical and 27.91% being bilaterally asymmetrical. So it can be concluded that in palmar and plantar psoriasis there is predominantly bilateral symmetry, but, it can be unilateral in few cases and pose diagnostic difficulties. Similar is the case with hyperkeratotic eczema, which can be unilateral, as seen in 11% cases. So it has to be distinguished from T. pedis and T. manuum. Tinea pedis and manuum is usually unilateral but can be bilateral in some.

Incidence of Involvement of Nails

In Palmar and plantar psoriasis out of 64 cases, 15 (40.54%) had involvement of nails, in Tinea Pedis and manuum 8 (53.33%) had involvement of nails out of 15 cases and in Hyperkeratotic eczema 36 (75%) had involvement out of 48 cases. So it can be concluded there is significant non

involvement of nails in Psoriasis of palms and soles, and nail changes cannot be relied upon for its diagnosis. In Tinea pedis and manuum there is significant involvement of nails, but again it is absent in almost 47% cases. In Hyperkeratotic eczema, though nail involvement was significant, the presence of specific nail changes was not seen.

Thus, looking at the clinical features of palmoplantar psoriasis, T. pedis and T. manuum and hyperkeratotic eczema it can be concluded that there is a considerable overlap in them. Likewise, itching which is reported to be absent in palmoplantar psoriasis has been seen in 29.73% cases. Also, palmoplantar psoriasis has been found to be unilateral in 2 cases and thus can be difficult to differentiate from T. pedis and T. manuum and unilateral hyperkeratotic eczema. Also, nail changes were absent in almost 60% cases of palmoplantar psoriasis. So for diagnosis we need to rely on history, examination and further investigations if needed.

Histopathology (Table 1)

Palmar and Plantar Psoriasis

In 37 cases of psoriasis of palms and soles, hyperkeratosis was a constant feature with variability in degree of hyperkeratosis. Mild hyperkeratosis was present in 8 (21.62%) cases and moderate hyperkeratosis in 20 (54.05%) cases. Parakeratosis in 6 (16.22%) was mild, 25 (67.57%) had moderate parakeratosis while 5 (13.51%) had marked parakeratosis. Acanthosis was prominent feature in all the cases. In 5(13.51%) it was mild acanthosis, moderate in 28(75.68%), while marked in 4(10.81%). Spongiosis was present in 30 (81.08%) cases out of 37. Munro's microabscesses were present in only 3 (8.11%) out of 37 cases. Pustule of Kogoj is an important feature of psoriasis. In our study it was present in only 3/37 (8.10%) cases. Suprapapillary thinning was present in 35(94.59%) cases out of 37. Out of 37 cases, in 3 (8.11%) mild elongation of rete ridges was present, in 21(56.76%) moderate elongation was present, and in 13(35.13%) marked elongation of rete ridges was present. Exocytosis of neutrophils was present in 13 (35.14%) cases. The type of infiltrate around blood vessels varied in many cases. In 6 (16.22%) mononuclear cells were present, neutrophils alone were present in none, while in 31 (83.78%) both neutrophils and mononuclear cells were present.

Thus in present study of 37 cases of psoriasis of palms and soles, hyperkeratosis, parakeratosis and acanthosis was present in all the cases. Spongiosis was observed in much high cases (81.08%), while Munro's microabscess and Pustule of Kogoj were seen in only 3% cases.

Table 1: Histopathological features

Histopathological feature	Palmoplantar Psoriasis (in %)	Tinea Pedis and Tinea manuum (in %)	Hyperkeratotic Eczema (in %)
Degree of hyperkeratosis			
Mild	21.62	66.67	14.58
Moderate	54.05	33.33	60.42
Marked	24.32	0	25.00
Degree of parakeratosis [#]			
Mild	16.22	20	22.92
Moderate	67.57	6.67	56.25
Marked	13.51	0	6.25
Degree of acanthosis			
Mild	13.51	86.67	22.92
Moderate	75.68	13.33	66.67
Marked	10.81	0	10.42
Degree of spongiosis [*]			
Mild	51.35	40	14.58
Moderate	29.73	13.33	43.75
Marked	0	0	37.50
Presence of munro's microabscesses			
Present	8.11	0	0
Absent	91.89	100	100
Presence of Pustule of Kogoj			
Present	8.11	0	0
Absent	91.89	100	100
Presence of supra-papillary thinning in stratum malpighium			
Present	72.97	0	0
Absent	27.03	100	100
Degree of elongation of rete ridges			
Mild	8.11	80	14.58
Moderate	56.76	20	35.42
Marked	35.13	0	50
Degree of elongation of papillae and clubbing of papillae			
Mild	5.41	73.33	12.5
Moderate	45.95	26.67	22.92
Marked	48.64	0	64.58
Type of exocytosis [@]			
Neutrophilic	35.14	0	0
Lymphocytic	0	0	93.75
Mixed	51.35	0	6.25
Type of infiltrate in the dermis			
Neutrophilic	0	0	0
Lymphocytic	16.22	100	93.75
Mixed	83.78	0	6.25
Type of infiltrate around blood vessels			
Neutrophilic	0	0	0
Lymphocytic	16.22	100	93.75
Mixed	83.78	0	6.25

[#]parakeratosis was absent in 73.33% cases of Tinea Pedis and Tinea manuum and 14.58% cases of Hyperkeratotic Eczema. ^{*}spongiosis was absent in 18.92% cases of Palmoplantar Psoriasis, 46.67% cases of Tinea Pedis and Tinea manuum and 4.17% cases of Hyperkeratotic Eczema. [@]exocytosis was absent in 13.51% cases of Palmoplantar Psoriasis, 100% cases of Tinea Pedis and Tinea manuum

Tinea Pedis and Manuum

Hyperkeratosis is a constant feature of the ringworm infections. Out of 15 cases in 10 (66.67%) mild hyperkeratosis was present and in 5 (33.33%) moderate hyperkeratosis was present. Out of 15 cases, in 4(26.67%) parakeratosis was present. Acanthosis was present in all 15 cases. In 13 (86.67%) mild acanthosis was present, in 2 (13.33%) moderate acanthosis was present, marked acanthosis was absent. Spongiosis was present in 8 (53.33%) cases out of 15. No Munro's micro abscesses or pustule of Kogoj were present. In 3 (20%) cases out of 15, suprapapillary thinning of stratum malpighium was found. Out of 15 cases, elongation of rete ridges was mild in 12 (80%), moderate in 3(20%). Papillomatosis was present in all 15 cases. In 11 (73.33%) it was mild and in 4 (26.67%) moderate elongation of papillae was present. Exocytosis was absent in all cases. Dermal infiltrate was present in all 15 cases. The infiltrate was monocytic in all cases. Infiltrate around blood vessels was found in all 15 cases and the infiltrate was monocytic.

So it can be concluded that the histopathology of Hyperkeratotic Tinea pedis and manuum is characterized by mild hyperkeratosis and acanthosis. Mild parakeratosis was seen in few cases. Vesicle formation and spongiosis were noted in epidermis. Also elongation of rete ridges and papillomatosis was seen in all cases but was mild in maximum cases. Absence of Munro's microabscesses and pustule of Kogoj differentiated if from Psoriasis of palms and soles.

Hyperkeratotic Eczema

Hyperkeratosis was a constant feature in all the cases. In 7 (14.58%) mild hyperkeratosis was present, in 29 (60.42%) moderate hyperkeratosis was present and in 12 (25%) marked hyperkeratosis was present. Out of 48 cases, parakeratosis was seen in 41 (85.42%) cases. 11 (22.92%) had mild parakeratosis, 27(56.25%) had moderate parakeratosis and 3 (6.25%) had marked parakeratosis. Acanthosis was present in all 48 cases. In 11 (22.92%) mild acanthosis was present, in 32 (66.67%) moderate acanthosis was present and in 5 (10.42%) marked acanthosis was present. Spongiosis was present in 46 (95.83%) cases out of 48 and was absent in 2 (4.17%). No Munro's microabscesses or pustule of Kogoj were found in the epidermis. Suprapapillary thinning of stratum malpighium was absent. Elongation of rete ridges was present in all 48 cases. In 7 (14.58%) mild elongation of rete ridges was present, in 17 (35.42%) moderate elongation was present and in 24 (50%) marked elongation of rete ridges was present. Papillomatosis was seen in all 48 cases of hyperkeratotic eczema. It was mild in 6(12.5%), moderate in 11(22.92%) and marked in 31(64.58%). Exocytosis in epidermis was present in all 48 cases. In 3 (6.25%) cases the infiltrate was mixed, while in 45 (93.75%) exocytosis of mononuclear cells was present with spongiosis in few cases.

Dermal infiltrate was present in all 48 cases. In 3 (6.25%) cases it was mixed i.e. neutrophilic and mononuclear, while it was only mononuclear in 45(93.75%). Infiltrate around blood vessels was also noted in all cases. Out of 48, in 3 (6.25%) cases it was mixed i.e. neutrophilic and mononuclear, while it was only mononuclear in 45(93.75%).

After histological analyses of 48 cases, following inference can be made. Hyperkeratosis, parakeratosis, acanthosis and spongiosis are moderate to marked in hyperkeratotic eczema. Marked elongation of rete ridges and papillomatosis is also a feature of hyperkeratotic eczema. The predominant infiltrate is mononuclear, though neutrophilic infiltrate might be seen in infected eczema. Absence of Munro's microabscesses, pustule of Kogoj and suprapapillary thinning differentiated it from psoriasis of palms and soles.

Thus after histological analysis of these 100 cases it can be inferred that there is a considerable overlap in histological features of these three conditions. Hyperkeratosis, acanthosis and parakeratosis is seen in all cases. In palmoplantar psoriasis, spongiosis, which has been reported to be absent, was seen in 51.35% cases. Munro's microabscess and pustules of Kogoj which are diagnostic of palmoplantar psoriasis are seen only in 8.11% cases. Also, predominant neutrophilic exocytosis has been seen only in 35.14% cases.

INVESTIGATIONS

Special Investigations

A) Positivity of skin scrapings for dermatophytes

Out of 15 cases of Tinea pedis and manuum in 6 (40%) skin scrapings for fungus were positive on KOH exam.

B) Positivity of nail cutting for dermatophytes

Out of 15 cases, nail cutting for fungus were positive in 8 (53.33%) cases on KOH exam.

C) PAS positivity

Out of 15 cases, PAS positivity for fungus was detected in 11 (73.33%) cases.

D) Pus for culture and sensitivity

In all 100 cases of all three dermatoses, i.e., psoriasis of palms and soles, T. pedis and T. manuum and hyperkeratotic eczema, pus for culture was negative.

E) Culture

Culture was done in 7 KOH negative cases on Sabouraud's dextrose agar medium. No growth

was obtained in any culture after 3 weeks. Only contaminants grew in 3 cases.

So it can be concluded that the sensitivity of KOH, PAS and culture is low. KOH negative cases should be subjected to culture in suspected cases. PAS staining should be done to aid in diagnosis.

CONCLUSION

Thus from the present study of 100 cases of hyperkeratotic lesions of palms and soles it can be concluded that: classical clinical and histopathological features are seen in most of the cases. Cases in which they are absent, skin biopsy and special investigations has to be done to aid in diagnosis. There is a considerable overlap in clinical and histopathological feature of these conditions and the sensitivity and specificity of special tests is low. Thus a clinicopathological correlation is required for appropriate diagnosis. This would help in a better management of patients.

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