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Original Research Article

Histopathological Study of Psoriasis: A Prospective Cum Retrospective Study at a Tertiary Care Centre

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Abstract

Background and Objectives: Psoriasis is a chronic papulosquamous disorder with constant exacerbations and remissions. Based on the clinical overlap with other papulosquamous disorders and the role of histopathology in diagnosis, we undertook a study on psoriasis. The objective of this study was to identify combination of histopathological parameters for the diagnosis of psoriasis and establish their reliability and significance. ***Material and Methods****:* A retrospective cum prospective study over a period of 5 years was carried out. 56 clinically diagnosed cases of psoriasis were taken into consideration. Skin biopsies were taken from these cases and histopathological examination was done. These lesions were then assessed based on various histopathological parameters. ***Results and Discussion****:* Maximum number of cases were in the age group of 31–40 years, males being three times more affected than females. The most common symptom was pruritis and psoriasis vulgaris was the most common variant. Upper limbs and back were most frequently affected. Among the microscopic parameters, acanthosis and parakeratosis were observed and when present with features like hypogranulosis, elongation of rete ridges, dermal inflammation and vasodilation or perivascular lymphocytic infiltrate were likely to indicate psoriasis. Munro micro abscesses and spongiform pustules of Kogoj, diagnostic features of psoriasis were also seen in significant proportion. ***Conclusion*:** Diagnosis of psoriasis is made based on the analysis of clinical symptoms and signs with a correlation with histopathological features. The relative ambiguity associated with this disease makes such histopathologic studies all the more important.

Keywords: Papulosquamous skin lesions, Psoriasis, Histopathology, Dermatopathology.

INTRODUCTION

Papulosquamous lesions of the skin are encountered with considerable frequency in recent times. Psoriasis is a very important subtype among these lesions. Psoriasis is a chronic papulosquamous disease, which has an unpredictable waxing and waning course [1]. It is associated with cardiovascular, psychiatric and musculoskeletal co-morbidities. The varying presentations of this disease makes its diagnosis challenging [2]. Diagnosis of psoriasis is made based on the analysis of clinical symptoms and signs with a correlation with histopathological features [1-3]. This makes recognising of the characteristic histopathological parameters for the diagnosis all the more important for these lesions. Taking all these factors in consideration we are presenting a study on psoriasis undertaken at our institute.

MATERIALS AND METHODS

A retrospective cum prospective study of psoriasiform lesions was carried out in the department of Pathology at a tertiary health care hospital over a period of 5 years. 56 clinically diagnosed cases of psoriasis irrespective of age and gender were taken into consideration. Skin biopsies were taken from these cases. These were then fixed in 10% formalin, subjected to tissue processing followed by embedding in paraffin blocks, sectioning and finally stained with haematoxylin and eosin. Histopathological examination of these lesions were carried out. These lesions were then assessed based on various histopathological parameters. The statistical analysis was done by comparing the percentages of various histopathological parameters taken into consideration and their consistency and reliability for diagnosis of psoriasis was observed.

RESULTS AND DISCUSSION

RESULTS

56 cases were diagnosed to have psoriasis in the study period. Maximum number of cases were in the age group of 31–40 years i.e. 19 cases (34%) (Figure-1a). Least affected was the age group of 0–10 years that is 1 case (2%). 43 (77%) males and 13 (23%) females were diagnosed to have psoriasis with the male to female ratio being 3.30:1 (Figure-1b).

The patients commonly presented with pruritis of varying intensities. The most common site was upper limbs and back with 18 cases (33%) each. The least common sites were chest, face and genitals with 1 case (2% each) (Figure-1c). Out of the total 56 cases of psoriasis, 47 (84%) cases were diagnosed to be psoriasis vulgaris, 4 (7%) cases were pustular psoriasis, 3 (5%) cases were guttate psoriasis and 2 (4%) cases were inverse psoriasis (Figure 1d). On examination, the lesions were circular, well circumscribed, red papules or plaques with grey or silvery-white, dry scales distributed symmetrically (Figure-2).

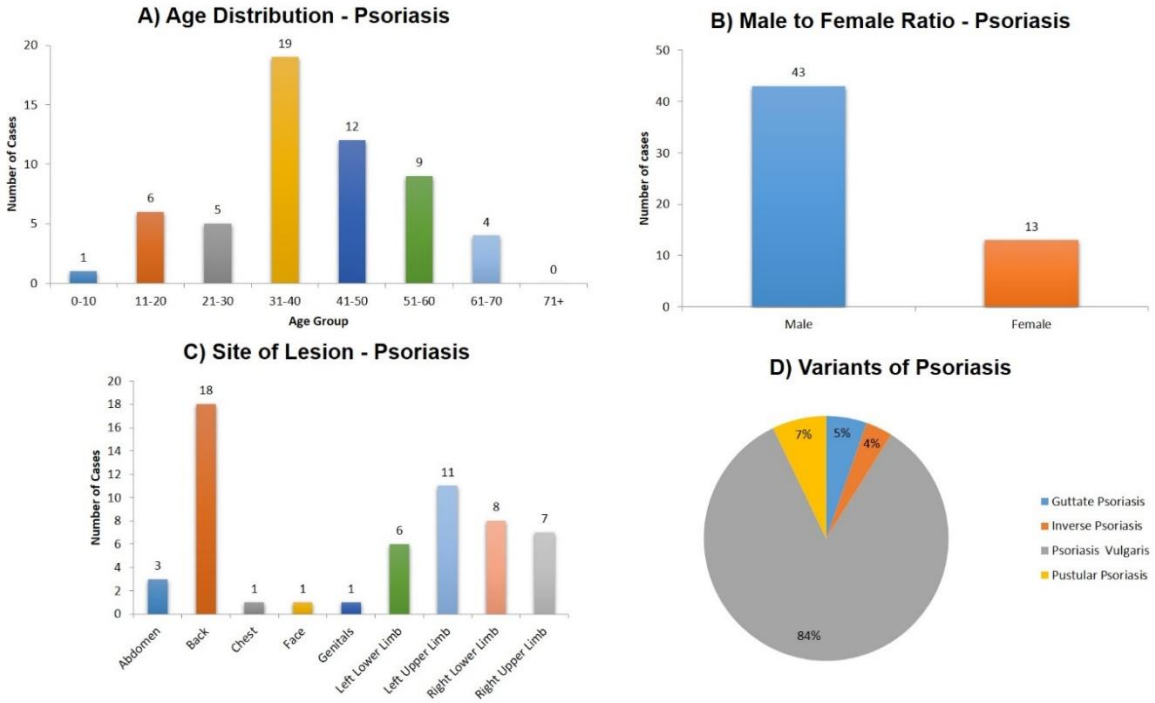

Fig-1: Psoriasis- A) Age Distribution- Most common group- 31-40 years B) Male : Female Ratio- 3.30:1 C) Site of Lesion-Most common- Upper limbs and Back D) Variants- Most common- Psoriasis Vulgaris

Fig-2: Lesions are classically circular, well circumscribed, red papules or plaques with grey or silvery-white, dry scales

Among the various microscopic parameters studied, acanthosis is seen in 52 (93%) cases, parakeratosis in 47 (84%), hypogranulosis and spongiform pustules in 34(61%) and 19(34%) cases respectively (Figure-3), Munro micro abscesses in 34(61%) cases (Figure 4), elongated rete ridges in 40 (71%) (Figure-5) and dermal inflammation in all the 56 (100%) cases. Table-1 gives a comparison of various microscopic parameters in this study with various other studies. From the table, it can be seen that acanthosis and parakeratosis are seen in most of the cases of psoriasis. These when present with features like

hypogranulosis, elongation of rete ridges, dermal inflammation and vascular change like vasodilation or perivascular lymphocytic infiltrate are likely to indicate psoriasis. Munro microabscesses and spongiform pustules of Kogoj which are diagnostic features of psoriasis were also seen in significant proportion in our study, further confirming this notion.

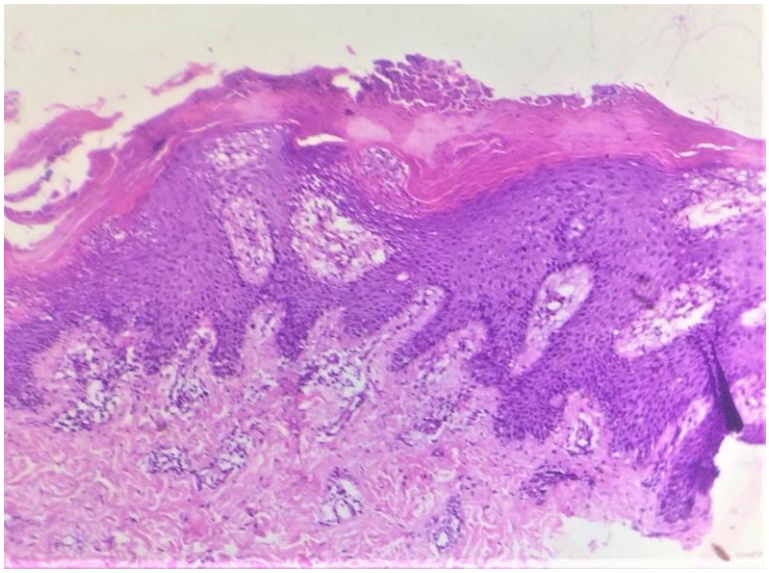

Fig-3: Microscopy- H & E stain (100X magnification)- Epidermis showing hypogranulosis and Spongiform pustules of Kogoj

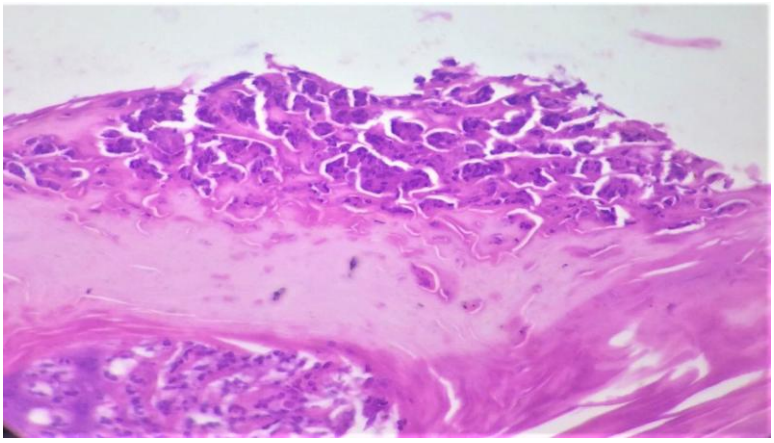

Fig-4: Microscopy- H & E stain (400X magnification)- Munro Microabscess- aggregates of neutrophils in stratum corneum

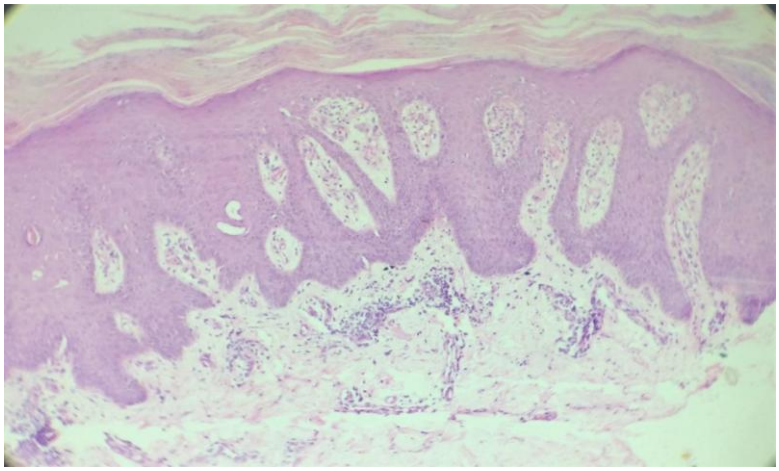

Fig-5: Microscopy- H & E stain (100x Magnification)- Elongation and fusion of rete redges leading to camel or club feet appearance

Table-1: Comparison of Microscopic parameters of Psoriasis in various studies

Parameters-Microscopy	Present study (%)	Hosamane S *et al*., (%) [24]	Raghuveer C *et al*., (%) [3]	Karumbaiah KP *et al*., (%) [1]	N. Vivekanand *et al*., (%) [21]	Younas M *et al*., (%) [25]
Epidermis						
Acanthosis	93	90.47	75	86.36	59	100
Parakeratosis	84	61.90	77	72.72	54	78.5
Hyperkeratosis	32	28.57	89	77.27	-	100
Orthokeratosis	11	-	-	-	-	-
Hypogranulosis	61	19.04	51	22.72	31	-
Munro microabscesses	61	26.19	58	22.72	39	71.4
Spongiform pustules	34	11.90	30	4.54	23	42.8
Elongated rete ridges	71	-	75	-	-	100
Suprapapillary dermal thinning	45	35.71	-	40.90	-	-
Dermis						
Dermal inflammation	100	66.66	98	81.81	-	-
Vascular change	64	14.28	90	86.36	51	-
Dermal appendages inflammation	30	-	-	-	-	-
Others						
Sub epidermal cleft	2	-	-	-	-	-
Dermal oedema	2	19.04	-	27.27	-	-
Destruction of basal layer of epidermis	2	-	-	-	-	-
Non-specific findings	5	-	-	-	-	-

DISCUSSION

The word 'Psora' means itch [4]. Psoriasis is an increasingly common papulosquamous disorder. It has a worldwide distribution and its prevalence varies [5]. It is estimated that around 125 million people throughout the world and approximately 2–3% of the population in the United States are affected by it [6-8]. Prevalence among Asian populations is also lower as compared to Caucasians [9, 10]. Among Indian studies, as per Raghuveer C *et al*., 1.2% of their out patients had psoriasis [3].

Mean age of presentation is between 21-30 years [1, 3]. In the present study, maximum number of cases diagnosed with psoriasis were in the age group of 31- 40 years (34%). 9% cases were in the age group of 21-30 years, making the age group of 21 -40 years most commonly involved (43%). Least affected was the age group of 0-10 years (2%). This was similar to the findings of Raghuveer C *et al*., and Karumbaiah KP *et al*., who also found the age group of 21-40 years to be most affected [1, 3]. But as per Johnson M. et.al and Sicco K. et.al there is a bimodal age distribution between 21-30 and 51-60 years [2, 11]. This may be because it is believed that psoriasis can be divided into 2 types – type 1 and 2 based on age of onset. These two types are thought to be different in etiopathological associations and severity [5]. But this was not found in our study.

Many studies concur that there is not much difference in incidence of psoriasis between males and females [12, 13]. However, there are few that contradict this perception. As per Karumbaiah KP *et al*., the male to female ratio of incidence was 2.33:1 and as per Raghuveer C. et.al it was 3:1 [1, 3]. In our study too 77% males and 23% females were diagnosed to have psoriasis with a male to female ratio of 3.30:1. The lower incidence observed in females from this part of the world may be due to their being less attentive to health, and occurrence of psoriasis over covered parts [3].

Psoriasis is believed to be a polygenetic disease with several known triggers in the environment [14]. On the genetic front, several alleles (HLA-cw6, HLADQ* 0201, CYP1A1 and CCHCR1) and loci (PSORS1-9, PSORSASI) have been found to confer genetic predisposition for this disease, of which HLA-cw6 and PSORS1 have the strongest risk [15-18]. A variety of environmental factors have also been implicated in initiation and development of psoriasis. The primary pathologic process is dysregulation of interaction between activated T cells and antigen presenting cells leading to overproduction of interferon alpha and tumour necrosis factor alpha; both of which are pro-inflammatory which results in inflammation in the dermis with hyperproliferation and abnormal differentiation of epidermis [11].

The patient commonly presents with pruritis of varying intensities which is the most common symptom as was in our cases [19]. Other symptoms include irritation of the skin, burning sensation, pain and bleeding [20]. On examination, the lesions are classically circular, well circumscribed, red papules or plaques with grey or silvery-white, dry scales distributed symmetrically which were seen in all our cases [5]. In the cases of psoriasis that we encountered the most common site was the upper limbs and back where they were seen in 33% cases, followed by the

lower limbs and abdomen where they were seen in 25% and 5% cases respectively. The least common sites were chest, face and genitals where they were found in 2% cases each. Other studies however had different observations. N. Vivekanand *et al.*, and Karumbaiah KP *et al*., reported lower limbs to be most commonly affected (49% and 41% respectively), followed by upper limbs (31% and 23% respectively), abdomen (8% and 23% respectively) and back (7% and 13% respectively) [1, 21]. The findings of Raghuveer C *et al*., were also similar [3]. It can be concluded that tough many studies find the lower limbs to be the most commonly affected site, in our study, it was the upper limb. New lesions can form at sites of trauma; this is known as Koebner phenomenon. Often removal of scale reveals pinpoint bleeding, called Auspitz sign [2].

Clinically, psoriasis can be of various types. Out of the total 56 cases of psoriasis studied, different variants were; 84% - psoriasis vulgaris, 7% - pustular psoriasis, 5% - guttate psoriasis and 4% - inverse psoriasis. Raghuveer C *et al*., also had similar observations. They found most common type of psoriasis to be psoriasis vulgaris (83%), followed by guttate (8%), pustular (3%) and inverse psoriasis (1%) [3]. Even N. Vivekanand *et al.*, also reported similar incidence of various types [21]. Hence it can be concluded that psoriasis vulgaris is the most common type of psoriasis.

The various histologic features of psoriasis are hyperkeratosis, parakeratosis – focal or confluent, acanthosis, hypogranulosis to agranulosis, suprapapillary epidermal thinning, elongation of rete ridges, Munro microabscesses and spongiform pustules of Kogoj in the epidermis with capillary dilatation and mild dermal infiltration in the dermis [1-3, 22]. These features are present in various combinations depending on the age of lesion and activity, as psoriasis is a dynamic dermatosis with these morphological changes occurring during the evolution of a lesion. The early stage consists of dilatation of blood vessels in the papillary dermis and perivascular lymphocytic cuffing. This is followed by thickening of the epidermis with loss of granular layer and parakeratosis which is believed to be due to shortened cell turnover time. In the advanced stage there is acanthosis, elongation of rete ridges, suprapapillary epidermal thinning with confluent parakeratosis with transmigration of inflammatory cells through epidermis into parakeratotic scale, resulting in collections of neutrophils known as Munro Microabscesses. Similar accumulation in the stratum spinosum are known as “spongiform pustule of Kogoj [22]. Among the various microscopic parameters in the present study, acanthosis was seen in 93% cases, parakeratosis in 84% cases, elongated rete ridges in 71% cases and dermal inflammation in 100% cases. Munro Microabscesses and spongiform pustules were seen in 61% and 34% cases respectively.

Diagnosis of psoriasis is made based on the analysis of clinical symptoms, signs and histopathological features [1-3]. Treatment depends on the type and severity of the disease. The mainstay of treatment includes methotrexate, cyclosporine and acitretin [23].

CONCLUSION

Psoriasis is an increasingly common papulosquamous disorder of relatively unknown aetiology. The clinical presentation of psoriasis is variable and can be confused with other papulosquamous disorders. As of today confirmatory diagnosis of psoriasis is on histopathology. This makes the identification of specific and sensitive histopathologic parameters along with a combined assessment of various clinical and histopathologic parameters to arrive at the diagnosis all the more important. The relative ambiguity associated with this disease makes such histopathologic studies all the more important in revealing and understanding the mystery called psoriasis.

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