



A Clinicopathological Study of Inflammatory Dermatoses

Prasanthi Cherukuri ^{1*}, Vasundara Gardas ², Sanjana Nutakki ³

^{1*} Associate Professor, Department of Pathology, GITAM Institute of Medical Sciences and Research, GITAM Deemed to be University, Visakhapatnam-530045, Andhra Pradesh, India.

² Associate Professor, Department of Pathology, GITAM Institute of Medical Sciences and Research, GITAM Deemed to be University, Visakhapatnam-530045, Andhra Pradesh, India.

³ Assistant Professor, Department of Pathology, GITAM Institute of Medical Sciences and Research, GITAM Deemed to be University, Visakhapatnam-530045, Andhra Pradesh, India.

*Corresponding author's E-mail: cherukuriprasanthi@gmail.com

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ABSTRACT

Introduction: The instant pattern recognition seen in neoplastic, and few infectious disorders is not seen in inflammatory dermatoses. An overall assessment of the clinical features and microscopic features aids in the diagnosis of inflammatory lesions which have several overlapping features in common. Inflammatory dermatoses include psoriasiform diseases, lichenoid diseases, vasculopathic diseases, spongiotic diseases and vesiculobullous diseases.

Aim: The current study is aimed to evaluate the pathological findings in inflammatory skin lesions and to compare with the pathological with clinical findings.

Material and methods: This is a study conducted at GITAM institute of medical sciences and research for a period of 18 months i.e., from January 2022 to June 2023. All the skin biopsies received at the department of pathology, GIMSR. Using 10% formalin they were subjected to fixation and processed in automatic tissue processor and after taking 3-4 microns sections, staining was done with eosin and hematoxylin and a final histopathological diagnosis was made.

Results: The patterns of various tissue reactions were observed in our study were Lichenoid reaction pattern (23%), Psoriasiform reaction pattern (39%), Spongiotic reaction pattern (22.7%), Vesiculobullous reaction pattern (4.5%), Vasculopathic reaction pattern (7.9%). In our study the most common inflammatory dermatoses observed was psoriasis 26% (23 cases), variants of lichen planus 12.5% (11 cases), pityriasis Rosea 6.8% (6 cases) followed by 5.6% (5 cases) spongiotic dermatitis and leucocytoclastic vasculitis each. In 72 cases (82%) there was agreement between the clinical and histological diagnoses, whereas in 16 cases (18%) there was a discrepancy.

Conclusion: To narrow the differential diagnosis and arrive at the most accurate diagnosis, a systematic approach during histopathological assessment and sorting inflammatory dermatoses based on the reaction pattern are crucial.

Keywords: Inflammatory dermatoses, Lichenoid reaction pattern, Psoriasiform reaction pattern, Spongiotic reaction pattern, Vesiculobullous reaction pattern.

INTRODUCTION

The dermatopathologist in day-to-day practice faces a lot of challenges in diagnosing inflammatory dermatoses. The instant pattern recognition seen in neoplastic, and few infectious disorders is not seen in inflammatory dermatoses. An overall assessment of the clinical features and microscopic features aids in the diagnosis of inflammatory lesions which have several overlapping features in common. The aim of the dermatopathologist is to provide a clinically relevant diagnosis to the dermatologist. Inflammatory dermatoses include psoriasiform diseases, lichenoid diseases, vasculopathic diseases, spongiotic diseases and vesiculobullous diseases. A clinicopathological correlation is crucial for making a diagnosis when examining the skin's histology for signs of inflammatory dermatoses. Relevant demographic and clinical details of the patient need to be disclosed prior to the submission of biopsy specimen to achieve accurate and efficient histopathological diagnosis. A 4mm punch biopsy is necessary for the histopathological assessment of inflammatory dermatoses. According to the

methodology used by Elder et al. ¹ and adopted by Alsaad and Ghazarian ², the cases of inflammatory dermatoses are divided into different categories: The current study is aimed to evaluate the pathological findings in inflammatory skin lesions and to compare with the pathological with clinical findings.

MATERIAL AND METHODS

Study design: It is a retrospective study.

Study place: The study was conducted at GITAM institute of medical sciences and research, a tertiary care teaching hospital, Visakhapatnam.

Study period: The study was conducted for a period of 18 months i.e., from January 2022 to June 2023.

Inclusion criteria and Exclusion criteria: The study comprised all inflammatory dermatoses of the Superficial Cutaneous Reactive Unit that were sent in for histopathological analysis. The study excluded those instances that had malignancy, an infectious aetiology, or insufficient skin samples.



Institutional Ethics committee approval: The institutional ethics committee approved this retrospective study with an IEC – 199/2023.

Methodology: In this study we evaluated the most frequently encountered inflammatory dermatoses taking into consideration the clinical findings and diagnosis made by the dermatologist. All skin biopsies received by the department of pathology were fixed in 10% formalin, processed using an automatic tissue processor, and stained with hematoxylin and eosin after being cut into sections of 3 to 4 microns.

RESULTS

The research was carried out for a period of eighteen months and 88 total cases were reported with inflammatory dermatoses were seen. The demographic variable like patient age was reported from 10 to 76 Y. The inflammatory dermatoses in our study were more common among age group 40 to 50 years constituting 22%. The predominance of inflammatory dermatoses was higher in males (64%) than females (36%) (Table 1).

According to our investigation, the limbs (40%) and palms and soles (20%) were the most frequent sites of presentation, while the neck (6%) was the least frequent. The various tissue reaction patterns observed in our study were, Lichenoid reaction pattern (23%), Psoriasiform reaction pattern (39%), Spongiotic reaction pattern (22.7%), Vesiculobullous reaction pattern (4.5%) and Vasculopathic reaction pattern (7.9%) (Figure 1). Among the lichenoid tissue reaction majority i.e eight cases were reported with lichen planus (Table 2). Among the psoriasiform tissue reaction majority twenty three cases were reported with Psoriasis (Table 3). Among the spongiotic reaction pattern majority i.e five cases were reported with spongiotic dermatitis (Table 4). Among the vesiculobullous reaction pattern majority i.e three cases were reported with bullous pemphigoid dermatitis (Table 5). Among the vasculopathic reaction pattern majority i.e five cases were reported with Leucocytoclastic vasculitis

(Table 6). In our study the most common inflammatory dermatoses (Depicted from Figure 2 to Figure 9) observed was psoriasis 26% (23 cases), variants of lichen planus 12.5% (11 cases), pityriasis Rosea 6.8% (6 cases) followed by 5.6% (5 cases) spongiotic dermatitis and leucocytoclastic vasculitis each. A concordance between clinical diagnosis and histopathological diagnosis was observed in 72 cases (82%) and a discordance in 16 cases (18%) was observed (Table 7).

Table 1: Distribution of patients according to age

Age (years)	Number of cases
10-20	9
21-30	14
31-40	18
41-50	20
51-60	11
61-70	8
71-80	8
Total	88

Table 2: Frequency of lesions showing lichenoid tissue reaction pattern

Lichenoid reaction pattern	No of cases
Lichen planus	8
Lichen sclerosus	3
Lupus erythematosus	2
Hypertrophic lichen planus	2
Lichen planus pigmentosus	1
Lichen amyloidosis	1
Lichenoid drug eruption	1
Porokeratosis	1
Fixed drug eruption	1
Dermatomyositis	1
Total	21 (23%)

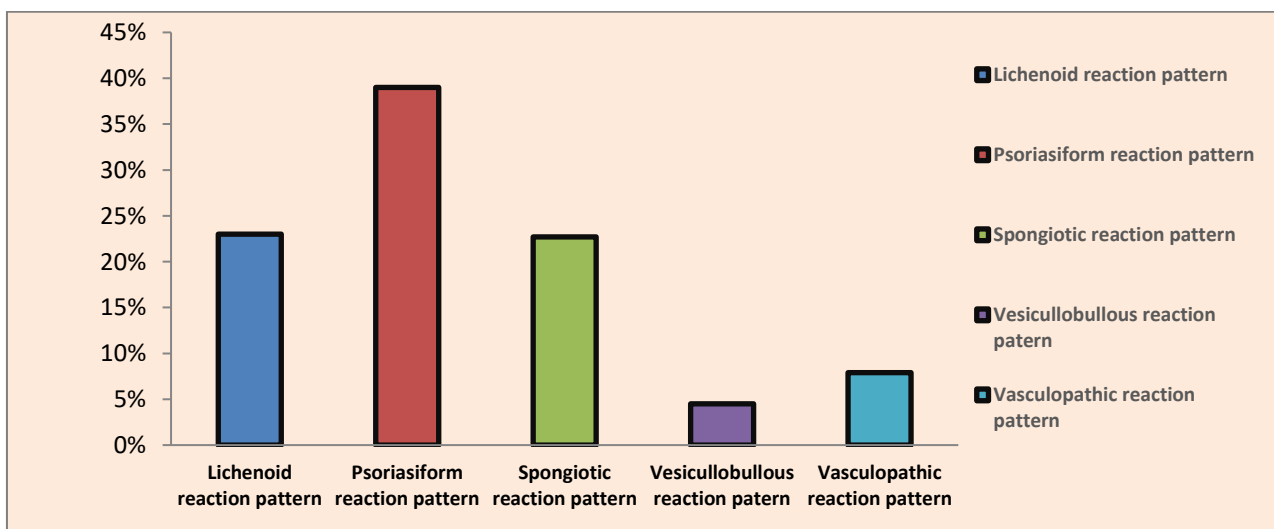


Figure 1: Various tissue reactions



Table 3: Frequency of lesions showing psoriasiform reaction pattern

Psoriasiform reaction pattern	No of cases
Psoriasis	23
Pityriasis Rosea	6
Palmoplantar psoriasis	2
Lamellar ichthyosis	1
Plaque parapsoriasis	1
Chronic plaque psoriasis	1
Lichen simplex chronicus	1
Total	35 (39%)

Table 4: Frequency of lesions showing Spongiotic reaction pattern

Spongiotic reaction pattern	No of cases
Spongiotic dermatitis	5
Eczema	4
Pigmented contact dermatitis	3
Prurigo nodularis	2
Seborrhic dermatitis	2
Stasis eczema	2
Allergic contact dermatitis	1
Hyperkeratotic eczema	1
Total	20 (22.7%)

Table 7: List of cases showing discordance with histopathological diagnosis

S.no	Tissue reaction pattern	Total no of cases	No of cases showing positive clinicopathological correlation	No of cases showing discordance with histopathological diagnosis
1	Lichenoid reaction pattern	21	15	6
2	Psoriasiform reaction pattern	35	30	5
3	Spongiotic reaction pattern	20	18	2
4	Vesiculobullous reaction pattern	4	4	0
5	Vasculopathic reaction pattern	7	4	3
	Total	88	72 (82%)	16 (18%)

The anatomical distribution of lesions observed in our study on inflammatory dermatoses revealed that limbs were more commonly involved mostly the upper limb and lower limb. This was similar to the studies done by Poonam Sharma et al.⁴ and Costa et al.⁶ Since the majority of lesions observed in our study appeared to be Psoriasis followed by Lichen planus and these lesions were more common on the limbs. An analysis of the broad categories of tissue reaction patterns in inflammatory dermatoses of our study showed psoriasiform reaction pattern to be the predominant pattern. Psoriasis was the commonest lesion comprising of 23 cases (26%), followed by 8 cases (9%) of Lichen planus. This was similar to a study done by Agarwal et al.⁷, Reddy et al.⁸ and Puri et al.⁹ Psoriasiform reaction is characterised by epidermal hyperplasia and regular elongation of rete ridges. Out of 35 cases (39.7%) of psoriasiform reaction pattern, 23 cases of psoriasis, followed by 6 cases of pityriasis Rosea.

Table 5: Frequency of lesions showing vesiculobullous reaction pattern

Vesiculobullous reaction pattern	No of cases
Bullous pemphigoid	3
Pemphigus foliaceus	1
Total	4 (4.5%)

Table 6: Frequency of lesions showing vasculopathic reaction pattern

Vasculopathic reaction pattern	No of cases
Leucocytoclastic vasculitis	5
Urticaria	2
Total	7 (7.9%)

DISCUSSION

Varied pathological stimuli cause varied tissue reaction patterns, each of which exhibits a unique set of clinical traits while sharing many of the same histopathological results³. The clinicopathological correlation is the only way to improve diagnostic specificity, even though histopathology is still the gold standard for dermatological diagnosis. The majority of cases in our study on inflammatory dermatoses were males between the ages of 41 and 50. These findings concurred with those of Poonam Sharma et al.⁴ and Kedariseti et al.⁵

Males appeared to be the predominant population presenting with this condition and this is in accordance with the worldwide statistics and was more common in the age group 40-50 yrs which was in accordance with Griffiths et al.¹⁰ and Bell et al.¹¹ Among 35 cases of psoriasiform reaction pattern a clinicopathological correlation was seen among 30 cases (85%), only in 5 cases (14%) there was a discordance as they showed psoriasiform reaction pattern but were clinically diagnosed as eczema, photodermatitis, keratoderma and pityriasis. Patients with psoriasis who also develop allergic contact dermatitis may have certain characteristics, and the latter lesions may share immunohistochemistry characteristics with both illnesses¹². The other lesions that displayed discordance had some clinical characteristics both histologically and clinically. The lichenoid reaction pattern, also known as the lichenoid tissue reaction or interface dermatitis, has been

described as a dermatosis where the infiltrate, which is typically primarily made up of lymphocytes, appears "to obscure the junction when sections are observed at scanning magnification" and is histologically characterised by epidermal basal cell damage¹³⁻¹⁶. In our study lichen

planus appeared to be the most predominant lesion comprising of 8 cases of Lichen planus followed by three cases of Lichen Sclerosus and two cases of Lupus erythematosus and Hypertrophic Lichen planus each.

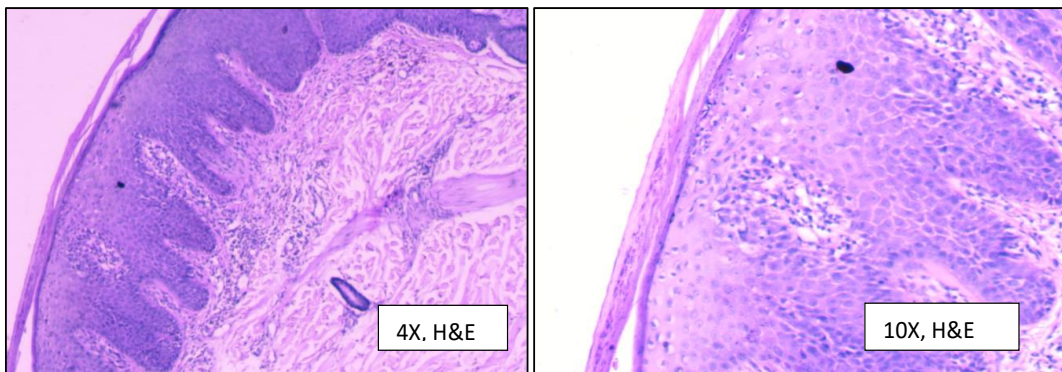


Figure 2: Psoriasis showing acanthosis, parakeratosis, regular elongation of rete ridges.

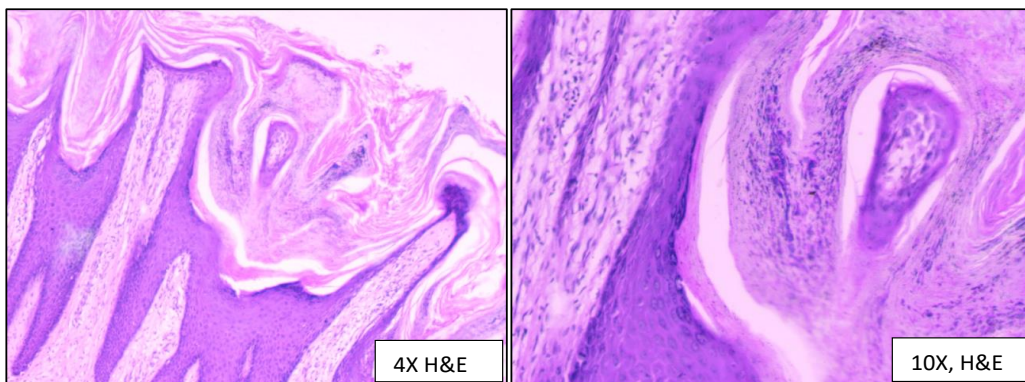


Figure 3: Psoriasis showing hyperkeratosis and micromunro abscess

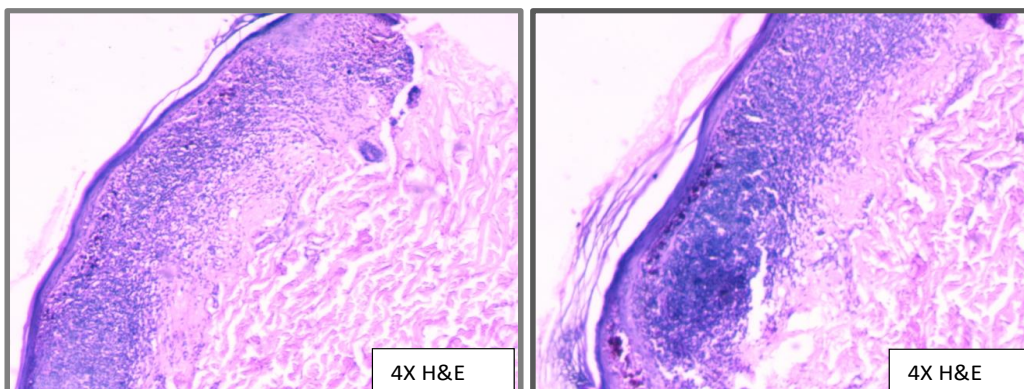


Figure 4: Lichen planus showing band like lymphocytic collections at the dermo-epidermal junction

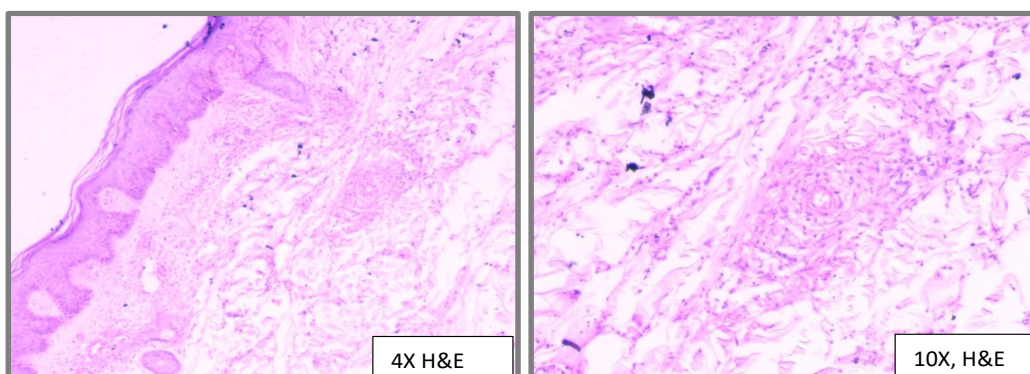


Figure 5: Leucocytoclastic Vasculitis showing inflammation around blood vessels.

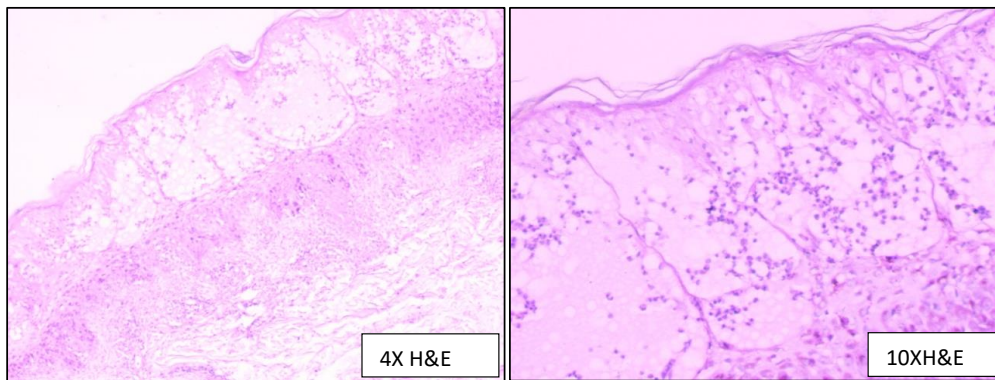


Figure 6: Pemphigus Foliaceus showing sub corneal blister with acantholytic cells

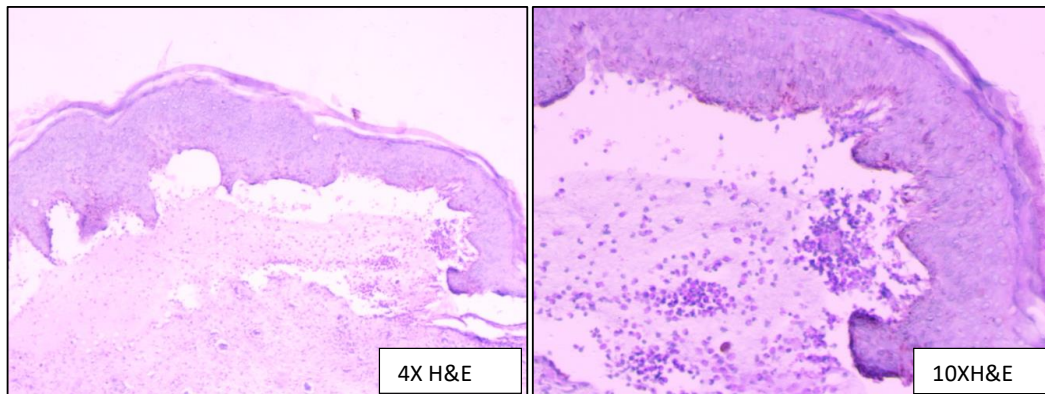


Figure 7: Bullous pemphigoid sub epidermal blister filled with eosinophils.

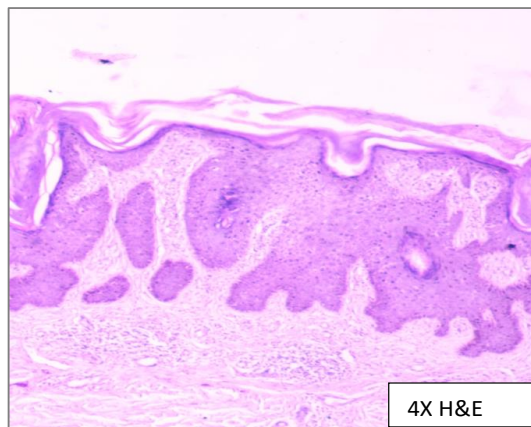


Figure 8: Prurigo Nodularis

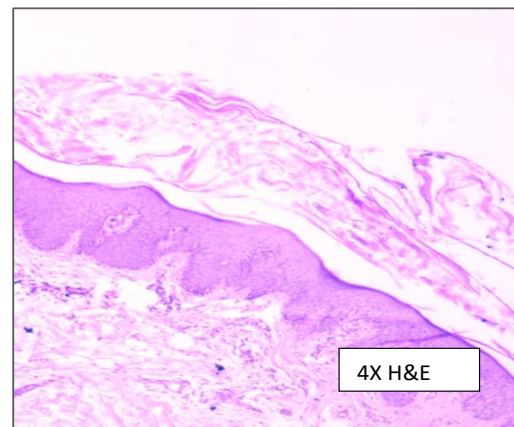


Figure 9: Pityriasis Rosea

In our study lichenoid tissue reaction pattern was observed in 21 cases of which 15 cases (71%) showed clinicopathological correlation. The discordance seen in the six cases (28%) were clinically diagnosed as Morphea but turned out to be lichen sclerosis on histopathology. Guttate morphea consists of small, pale, slightly indurated lesions on the upper part of the trunk that may resemble lichen sclerosis et atrophicus¹⁷. The other case was clinically diagnosed as chronic actinic dermatitis and Lichen Plano pilaris which were histopathologically reported as Lichen planus and lichen amyloidosis respectively. The presence of intraepidermal and intercellular edoema, which may be seen as expanded voids between keratinocytes and lengthened intercellular bridges, is what distinguishes the spongiotic tissue reaction¹⁸. In our study spongiotic reaction pattern was seen in 20 cases and in 18

cases (90%) there was concordance in the clinical and histopathological diagnosis. Only two cases there was discordance, which were diagnosed clinically as psoriasis was reported as sub acute spongiotic dermatitis. Early psoriasis can develop spongiosis in conjunction with lymphocyte exocytosis¹⁹. The presence of vesicles or bullae at any level of the epidermis or at the dermoepidermal junction defines the vesiculobullous response pattern. This type of reaction includes pustules, which are vesicles or bullae containing plenty of neutrophils or eosinophils¹⁹. Three cases of Bullous Pemphigoid and one case of Pemphigus foliaceus in our investigation had no clinical or histopathological disagreement. The vasculopathic reaction pattern includes a clinically heterogeneous group of diseases that have in common pathological changes in blood vessels²⁰. There were seven cases of vasculopathic

reaction observed in our study, 5 cases were diagnosed as leucocytoclastic vasculitis and two cases of urticaria. There was clinicopathological correlation in four cases but there was discordance in three cases, out of which two cases which were clinically diagnosed as Erythema Nodosum and another as Nodular vasculitis was found to be Leucocytoclastic vasculitis on histopathology.

Leukocytoclastic vasculitis usually characterized by palpable purpura or erythematous macules, and it affects dependent body parts, especially the lower legs²¹⁻²³. Hemorrhagic vesicles and bullae, nodules, 23-crusted ulcers, and, less frequently, livedo reticularis, pustules, or annular lesions are additional abnormalities that may be present. The overall clinicopathological correlation of inflammatory dermatoses in our study was found to be 82% and a discordance of 18% was seen. Other studies done by Reddy et al.⁸, Chabbi et al.²⁴, Younas et al.²⁵, Kaur et al.²⁶ showed a concordance of 86.5%, 85%, 76.3%, and 74% respectively. An overall assessment of the patient based on both clinical and microscopic features generally yields the most precise diagnosis.

CONCLUSION

Histopathology continues to be the gold standard in the diagnosis of inflammatory dermatoses due to the extensive overlap between the clinical characteristics and different inflammatory dermatoses. A systematic approach during histopathological evaluation and categorising inflammatory dermatoses based on the reaction pattern is essential to narrow the differential diagnosis, thereby achieving the most appropriate diagnosis.

AUTHORS CONTRIBUTIONS: Author Prasanthi Cherukuri contributed for study conception and design, data collection, analysis and interpretation of results and manuscript preparation. Author Vasundara Gardas contributed in manuscript preparation and data analysis. Author Sanjana Nutakki contributed for data collection and literature collection.

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