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A Study of Dermato histopathological patterns with reference to site and morphology of lesions: a retrospective cross-sectional study at a tertiary care centre.

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ABSTRACT

Background

Skin diseases are frequently encountered among the health problems in a developing country like India.The heterogeneity of clinical presentation and diversity in the spectrum of skin lesions makes histopathological examination imperative. A complete correlation between clinical presentation and history provides a clue to arrive at the final diagnosis and also improves the diagnostic specificity of skin lesions. Therefore, the present study was conducted with the objectives of categorizing the patterns of skin lesions into eight groups (I-VIII) based on the final histopathological diagnoses, to evaluate the concordance index of clinical and histopathological diagnoses in each group, to study the frequency distribution of cases according to age, sex, site of involvement and morphology of lesions and to list out the various patterns of skin lesions in all the eight groups (I-VIII).

Materials and methods

The present study was a retrospective cross-sectional study conducted in the Department of Pathology. A total of 113 skin biopsies were received during the study period (January 2021 to January 2022) and a total of 105 skin biopsies meeting the inclusion criteria were included in the study after thoroughly analyzing the records available and details furnished on the request forms. Based on these histopathological diagnoses already given, the skin lesions were categorized into eight groups (I-VIII). Concordance index between the clinical and histopathological diagnoses were evaluated in each group. The data was recorded in Microsoft Excel sheet and statistically analyzed using SPSS for Windows software, version 20.0.

Results

A total of 105 skin biopsy specimens were included. Majority of the cases (25, 23.8%) were within the age group of 41-50 years. The mean age of presentation being 35 years. A slight female preponderance was noted with the male to female ratio being 0.9:1. The most common site of involvement was found to be face (31%) followed by upper extremity (20%). The most common morphology of skin lesion was nodule (23%) followed by papule (19%). Based on the final histopathological diagnosis, the skin lesions were categorized into eight groups (I-VIII). Majority of the skin lesions belonged to Group IV- Benign tumours, tumour-like lesions and cysts (41%).100% clinico-histopathological concordance was seen in all the groups except in Group IV: Benign tumours, tumour-like lesions and cysts (93%, n=43 cases) and Group VII: Vascular diseases (50%, n=2 cases). Total (fully and partially concordant cases) clinico-histopathological concordance was seen in 96% (n=101) of total cases. Discordance was seen in only 4% (n=4) of cases.

Conclusions:

Our study has highlighted on the importance of combined clinical, morphological and histological approach in arriving at a definitive diagnosis. A very strong clinico-histopathological concordance was established in our study and it aided in initiating an early treatment plan to the patients.

Keywords: Histopathology, Vesiculobullous, Papulosquamous, Infectious, Benign, Malignant

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INTRODUCTION:

In a developing country like India, the prevalence of skin diseases varies from 4.2-11.6% in the general population [1,2]. Although many of the skin diseases are benign with low mortality, some of them need medical observation, follow up and immediate intervention and can also cause serious psychosocial problems affecting the quality of life [3,4,5]. Most of the skin lesions are diagnosed by just clinical examination and history. However, some skin lesions pose diagnostic dilemma and in order to overcome it, there is a need for performing simple procedure like skin biopsy followed by the histopathological examination (HPE) [6].

The heterogeneity of clinical presentation and diversity in the spectrum of skin lesions makes histopathological examination imperative. Histopathology still remains the gold standard to arrive at a definitive diagnosis [6]. A complete correlation between clinical presentation and history such as age, sex, anatomical location, duration, number of lesions, morphology of lesions etc., provides an indispensable clue to conclude the final diagnosis and also improves the diagnostic specificity of skin lesions[7].

OBJECTIVES

1 To categorize the patterns of skin lesions into eight groups (I-VIII) based on the final histopathological diagnosis.
2 To evaluate the concordance index of clinical and histopathological diagnoses in each group.
3 To study the frequency distribution of cases according to age, sex, site of involvement and morphology of lesions.
4 To list out the various patterns of skin lesions in all the eight groups (I-VIII).

MATERIALS AND METHODS

Study design: This was a retrospective cross-sectional study.

Study period: Skin biopsies received in the Department of Pathology during the period of January 2021 to January 2022 were included in the present study. During this period, a total of 7525 biopsies were received, out of which 113 (1.5% of total biopsies) were skin biopsies.

Sampling method: Purposive sampling

Inclusion criteria:

1. Cases with complete demographic and clinical details.
2. All types of skin biopsies were included (eg: punch, shave, curettage, excision biopsies).

Exclusion criteria:

1. Inadequate skin biopsies.
2. Improperly fixed biopsies.
3. Cases without a presumptive clinical diagnosis on the histopathology request forms.

Data collection procedure: Based on the details given in histopathology request forms and the available records from record section, out of 113 skin biopsies received during the study period, 08 biopsies were excluded from the study (as 05 biopsies were inadequate, 02 cases lacked complete clinical details and 01 biopsy was sent without formalin and was improperly fixed). Rest 105 cases were processed in Leica automated tissue processor, paraffin-embedded blocks were sectioned and stained routinely with Hematoxylin and Eosin (H& E) stain. The slides were reviewed by the pathologists under light microscopy. Special stains such as Ziehl-Neelsen stain (Z-N stain), Fite-Faraco stain, Periodic Acid Schiff (PAS) stain were used in relevant cases. The final histopathological diagnoses were conferred upon for the 105 cases, keeping in mind all the relevant clinical details (such as age, sex, site of biopsy, number of lesions, morphology of lesions, clinical diagnosis etc.) as furnished in the request forms sent along with the specimen and based on the histopathological findings as observed under microscope. Based on these histopathological diagnoses already made, the lesions were categorized into eight groups.

In addition to this, concordance index between the clinical and histopathological diagnoses were evaluated in each group. Clinico-histopathological concordance included three groups: Full concordance, partial concordance and discordance. Full concordance was defined as identical clinical and histopathological diagnosis.Partial concordance was defined as the histopathological diagnosis matching with atleast one of the clinical differential diagnosis as recorded by the dermatologist. Discordance was defined as the histopathological diagnosis completely differingfrom that of the clinical diagnosis and also thedifferential diagnosis. Total concordance was

defined as both combined fully concordant and partially concordant cases.

Statistical analysis: The data was recorded in Microsoft Excel sheet and statistically analyzed using SPSS for Windows software, version 20.0.

Ethical clearance: Institutional Ethical Committee clearance for the study was obtained [Reference number: SIMS & RC/IEC/18/2022-23].

RESULTS:

A total of 105 skin biopsy specimens fulfilling the inclusion criteria were included in the study. A wide variation in age distribution among the patients ranging from 1 year to 85 years was noted. Majority of the cases (23.8%) were within the age group of 41-50 years **(Table 1).**

Table 1: Distribution of the cases according to age and sex

Age group (in years)	No. Of cases	Percentage (%)	No. Of males	No. Of females
1-10	06	5.7	05	01
11-20	13	12.4	04	09
21-30	18	17.1	12	06
31-40	16	15.2	07	09
41-50	25	23.8	10	15
51-60	14	13.3	04	10
61-70	09	8.6	06	03
71-80	03	2.9	02	01
81-90	01	1.0	01	00
TOTAL	**105**	**100%**	**51**	**54**

The mean age being 35 years. A slight female preponderance was noted with the male to female ratio being 0.9:1. The most common site of involvement was found to be face (31%), followed by upper extremity (20%) and lower extremity (17%) **(Table 2).**

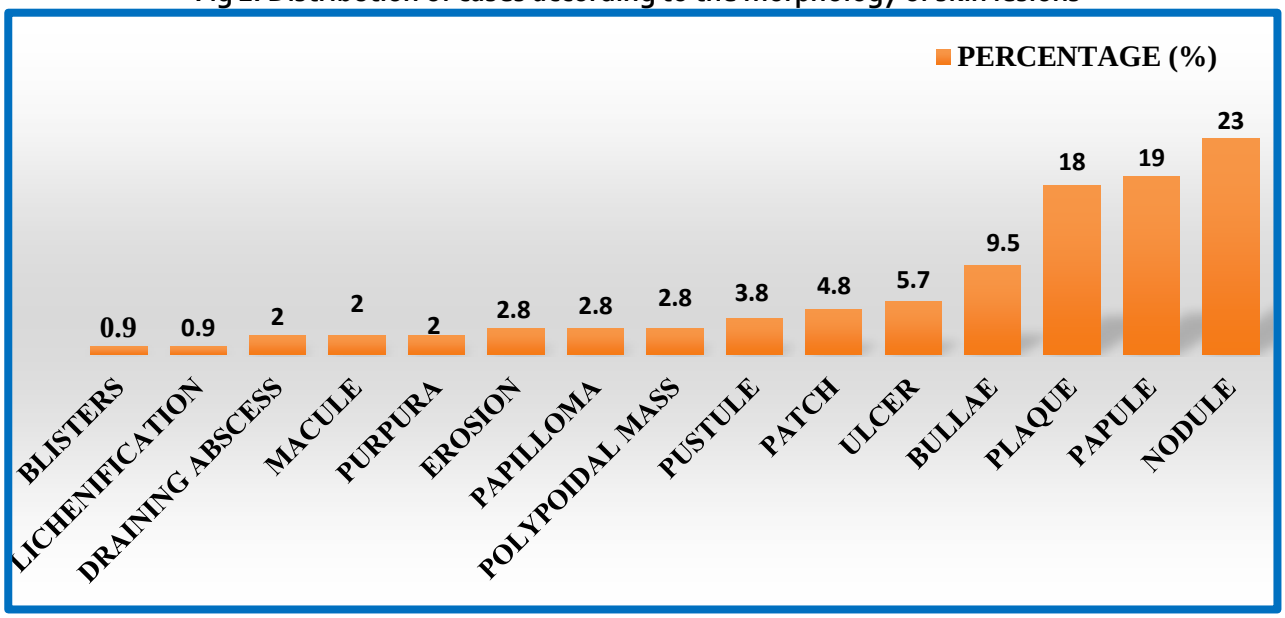
Table 2: Distribution of the cases according to the site of involvement

Sno	Site of involvement *	No. Of cases	Percentage (%)
1.	**SCALP**	11	**10.4**
2.	**FACE** (Forehead, eyelids, outer canthus of eye, nose, nasolabial fold, mouth, lip, gingiva, lower jaw, angle of mouth, chin, ear, ear lobule)	33	**31**
3.	**NECK**	03	**03**
4.	**SUPRACLAVICULAR REGION**	01	**01**
5.	**STERNUM**	01	**01**
6.	**CHEST**	03	**03**
7.	**ABDOMINAL WALL**	01	**01**
8.	**UPPER EXTREMITY** (Shoulder, arm, elbow, forearm, wrist, hand, fingers, palm)	21	**20**
9.	**LOWER EXTREMITY** (Thigh, knee, calf, shin, ankle, foot, sole)	18	**17**
10.	**BACK**	08	**7.6**
11.	**PERINEUM**	01	**01**
12.	**VULVA**	02	**02**
13.	**GLUTEAL REGION**	02	**02**
	TOTAL	105	**100**

NOTE: For the cases with multiple sites of involvement, the predominant site (site where the lesions were most noticeable and largest in number) involved is taken into consideration.

The most commonly observed morphology of skin lesion was nodule (23%) followed by papule (19%) and then plaque (18%) **(Fig 1).**

Fig 1: Distribution of cases according to the morphology of skin lesions



NOTE:For the cases presenting with multiple morphologies of skin lesions, the predominant morphological presentation is taken into consideration.

After the final histopathological diagnosis, the skin lesions were categorized into following eight groups[8] **(Fig 2)**:

Group I: Non-infectious vesiculobullous/vesiculo pustular diseases

Group II: Non-infectious erythematous papulo squamous diseases

Group III:Infectious diseases of skin (Bacterial/ viral/ fungal/ protozoal)

Group IV: Benign tumors, tumor-like lesions and cysts

Group V: Malignant lesions

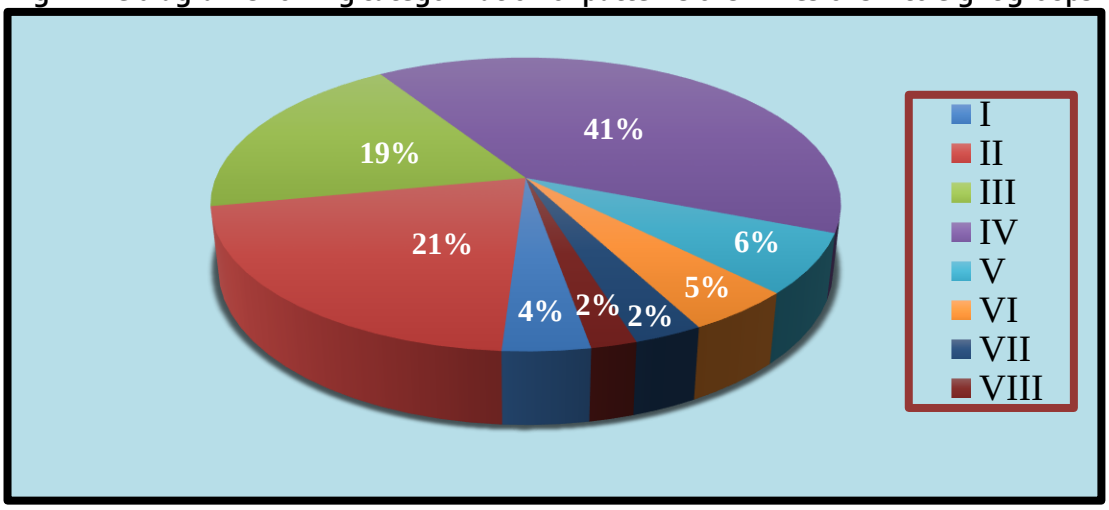
Group VI: Connective tissue diseases

Group VII: Vascular diseases

Group VIII: Genodermatoses

Majority of the skin lesions belonged to Group IV (41%) followed by Group II (21%) and Group III (19%) **(Fig 2).**

Fig 2: Pie diagram showing categorization of patterns of skin lesions into eight groups

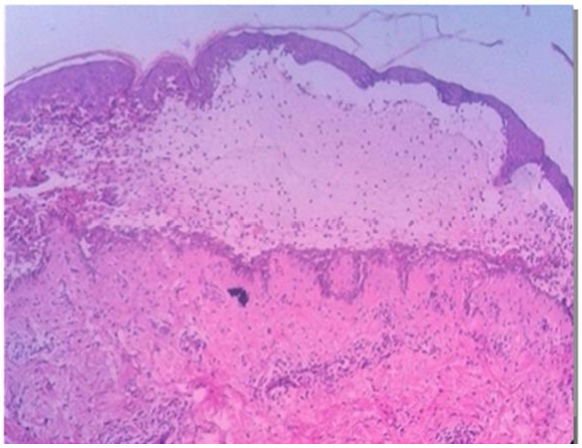


100% clinico-histopathological concordance was seen in all the groups except in Group IV:Benign tumours, tumour-like lesions and cysts (93%, n=43 cases) and Group VII: Vascular diseases (50%, n=2 cases). Total [fully concordant (n=80) and partially concordant (n=21)] clinico-histopathological concordance was seen in 96% (n=101) of total cases. Discordance was seen in only 4% (n=4) of cases**(Table3).**

Table 3: Table showing clinico-histopathological concordance index in each group

GROUPS	CONCORDANCE		TOTAL NO. OF CASES	CONCORDANCE INDEX (%)
	NO. OF TOTAL CONCORDANT CASES (FULLY AND PARTIALLY CONCORDANT CASES)	NO. OF DISCORDANT CASES		
GROUP I	04	0	04	100
GROUP II	22	0	22	100
GROUP III	20	0	20	100
GROUP IV	40	03	43	93
GROUP V	07	0	07	100
GROUP VI	05	0	05	100
GROUP VII	01	01	02	50
GROUP VIII	02	0	02	100
TOTAL	**101 (96%)**	**04 (4%)**	**105**	

Figure 3: GROUP I: Pemphigus vulgaris showing suprabasal bullae and "Tombstone" appearance of the basal layer [H & E stain, 100X]



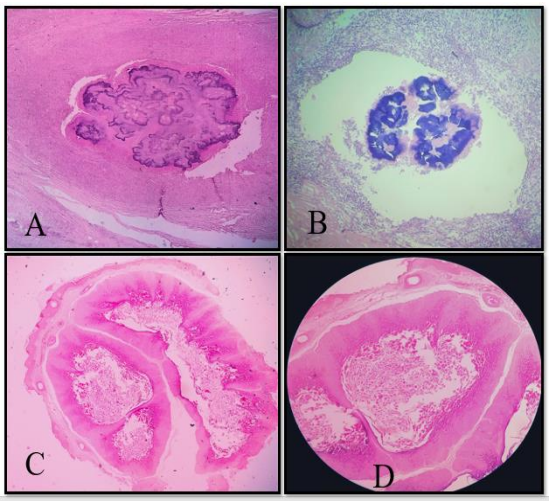
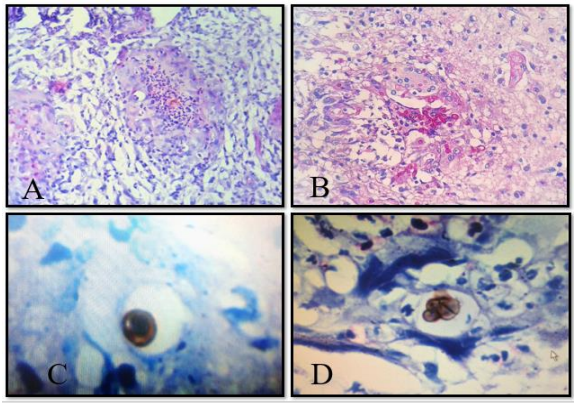


Figure 4: GROUP III: A & B- Actinomycosis showing radiating basophilic filaments of bacterial colonies [H & E, 100X]. C & D- Molluscum contagiosum showing inverted lobules of hyperplastic squamous epithelium and large number of molluscum bodies [H & E, 40X &100X

Figure 5: GROUP III: Chromoblastomycosis: A- Granulomatous inflammatory reaction with copper bodies in the centre [H & E, 100X]. B- Fungal elements highlighted in Periodic Acid Schiff (PAS) stain [100X]. C & D- Copper penny bodies/ sclerotic bodies in histopathological tissue section [H & E, 400X]



A very broad pattern of histopathological diagnoses were appreciated in each group.

Figure 6: GROUP IV: Cylindroma showing compact irregular tumour islands composed of basaloid cells fitting together in a "jig-saw puzzle" pattern (A, B: H & E, 40X) and showinghyaline droplets and hyaline deposits within the tumour and also in between the irregular lobules (C, D: H & E, 400X)

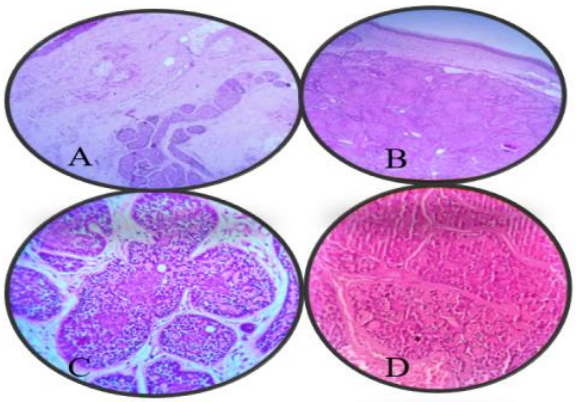


Table 4: List of patterns of skin lesions in all the categories

GROUP I	GROUP II	GROUP III	GROUP IV	GROUP V	GROUP VI	GROUP VII	GROUP VIII
Bullous pemphigoid	Hypertrophic Lichen planus	Furuncle	Epidermoid cyst	Basal cell carcinoma	Morphea	Livedoid vasculitis	Acrokeratosis Verruciformis of Hopf
	Lichen planus pigmentosus	Acute folliculitis	Trichilemmal cyst		Lichen sclerosus et atrophicus		
	Lichen striatus	Verruca plana	Granular cell tumour				
	Psoriasis	Indeterminate leprosy	Benign Fibrous Histiocytoma				
	Non-specific dermatitis	Lepromatous leprosy	Seborrheic keratosis				
	Ashy dermatosis	Histioid leprosy	Keloidal dermatofibroma				
	Acute Eczematous dermatitis	Erythema nodosum	Angiokeratoma				
	Lichenoid drug eruption	Molluscum contagiosum	Fibrokeratoma				
	Lichen simplex chronicus	Actino-mycosis	Chondroid syringoma				
	Post inflammatory hyperpigmentation (secondary to lichen planus)	Chromoblastomycosis	Proliferating trichilemmal cyst				
	Chronic spongiotic dermatitis	Madura-mycosis	Eccrine spiradenoma				
		Lupus vulgaris	Eccrine poroma				
		Bullous impetigo	Syringoma				
			Cylindroma				
			Pilomatricoma				
			Intradermal nevus				
			Xanthoma				
			Fibroepithelial polyp				
			Pyogenic granuloma				
			Nevus sebaceous				
			Neurofibroma				

			Sebaceous hyperplasia				
Pemphigus vulgaris	Lichen planus	Myrmecia/ Deep palmoplantar wart	Keloid	Squamous cell carcinoma	Cutaneous Lupus Erythematosus	Leukocyto-clastic vasculitis	Darier's disease
Bullous pemphigoid	Hypertrophic Lichen planus	Furuncle	Epidermoid cyst	Basal cell carcinoma	Morphea	Livedoid vasculitis	Acrokeratosis Verruciformis of Hopf
	Lichen planus pigmentosus	Acute folliculitis	Trichilemmal cyst		Lichen sclerosus et atrophicus		

DISCUSSION

The patterns of skin lesions are influenced by various factors such as literacy, socioeconomic status, religion, culture, and access to primary health care[8]. Skin diseases have wide clinical presentation with a broad histopathological spectrum[9].

In our study, a majority (25 cases, 23.8%) of the skin lesions occurred in fourth to fifth decade which was comparable to Chalise et al9 (Table 5).This study showed wide variation in age distribution, youngest was a male patient presenting at 1 year of age and the eldest patient was 85 years old male. There was a slight female preponderance (54 cases) in the present study which was comparable to Chalise et al.9, Bezburah K et al.10, Mamatha K et al.11 (Table 5).The most common site of involvement was on the face (31%) followed by upper extremity (20%) which was comparable to a study by Bezburah K et al. 10.

Maximum number of cases belonged to Group IV (Benign tumours, tumour-like lesions and cysts) in our study (41%), amongst which the commonest was epidermoid cyst, which was similar to the studies by Bezburah K et al. 10 and Gaikwad et al1.In Group I, out of 4 cases, three were Pemphigus vulgaris and one was Bullous pemphigoid. In Group II, majority of the cases were Lichen planus and its variants and two cases were Psoriasis. Among the Group III lesions, 5 cases were of Leprosy (1= Indeterminate, 3= Lepromatous, 1= Histioid leprosy). Special stain like Fite-faraco was done which demonstrated the leprae bacilli. Other diagnoses included deep infections like Actinomycosis (2 cases), Maduramycosis(2 cases), Chromoblastomycosis (1 case). Viral infectious skin lesions like Myrmecia (1 case), Verruca (2 cases), Molluscum contagiosum (1 case) were also seen similar to a study by Adhikari et al 8. In Group IV, a wide range was lesions were diagnosed such as epidermoid cysts (8 cases), seborrheic keratosis (2 cases), Angiokeratoma (1 case), Pyogenic granuloma (1 case) etc. Adnexal tumours like Cylindroma (2 cases), Syringoma (1 case), Eccrine poroma (1 case), Eccrine spiradenoma(1 case). Chondroid syringoma (1 case), nevus sebaceous (1case) etc. In Group V, 4 cases were Basal cell carcinoma and three were squamous cell carcinoma. This was contradictory to a study by Bezburah K et al. [10] wherein squamous cell carcinoma was the predominant malignant lesion. In Group VI, two cases of cutaneous lupus erythematosus, two cases of morphea and one case of lichen sclerosus et atrophicus were diagnosed. In Group VII, one case of leucocytoclastic vasculitis and one livedoid vasculitis were included. In Group VIII, one case of Darier's disease and one case of Acrokeratosis verruciformis of Hopf were included.
In the present study, majority of the skin lesions presented as nodule (23%) followed by papule (19%) (Fig 1).The morphological presentation of skin lesions has not been emphasized upon in many of the other studies in literature. However, in a study conducted by Tayal A et al.7, papule (84.2%) was the predominant morphologic presentation of skin lesions.
Total clinico-histopathological concordance was established in majority of the cases in present study (n=101, 96%) similar to studies by Aslan et al. 12 (76.8%), Bin Yap et al. 13 (92%), Gupta P et al.14 (85.8%) and Kafle SU et al. (87%) 15. High clinico-pathological concordance can be attributed to factors like good communication between the pathologist and dermatologist and other factors like good knowledge, precise site of taking biopsy, correct sampling techniques, sample storage,

transportation and processing methods. The histopathological diagnosis was discordant with clinical diagnosis in only 4% of our cases comparable to study by Gupta P et al. 14 (9.1%).

Table 5: Comparison table of present study with other studies

Sno.	Study by	Duration of study	Sample Size	Most frequent age group	Gender prepon-derance	Most common site	Mostcommon lesion
1.	Adhikari RC et al.[8]	2 years	1040	31-40 years	Male	Upper extremity	Non-infectious vesiculobullous and vesiculopustular lesions (297, 28.6%)
2.	Chalise et al.[9]	6 months	133	41-50 years	Female	Upper extremity	Non-neoplastic lesions (90, 67.7%)
3.	Bezbaruah et al.[10]	1 year	113	21-30 years	Female	Eyelid	Neoplastic lesions (92, 81.42%)
4.	Mamatha K et al.[11]	2 years	286	51-60 years	Female	ND*	Granulomatous lesions (154, 53.8%)
5.	Gupta P et al.[14]	1 year	253	31-40 years	Male	ND*	Infectiousdiseases (34.6%)
6.	Present study	1 year	105	41-50 years	Female	Face	Benign tumours, tumour-like lesions and cysts (43, 41%)

[* ND: Not Done]

CONCLUSION

The present study is unique as it highlights on the importance of a combined clinical, morphological and histological approach to arrive at a definitive diagnosis. Our study definitely adds on to the existing literature as very few or no studies have been done in the past combining the site of lesion and morphological presentation of skin diseases with other clinical findings. A very strong clinico-histopathological concordance was seen in majority (96%) of the cases which aided in initiating a definitive treatment plan for the patient.

The limitations of the study were smaller sample size and lack of follow up of the cases as the study was done retrospectively. The various diagnostic modalities used for arriving at the clinical diagnosis and also the management plan for each group of skin lesions can be considered as future recommendations for research.

REFERENCES

1. Gaikwad SL, Kumawat UD, Sakhare NA, D'costa GF. Histopathological Spectrum of Skin Lesions-Experience at Rural Based Hospital. Int J cur Res.2016 Aug;8(8):36223-7.
2. Grover S, Ranyal RK, Bedi MK. A cross section of skin diseases in ruralAllahabad.IndianJDermatol 2008;53:179-81.
3. Vivar KL, Kruse L. The impact of pediatric skin disease on self-esteem. Int J of Women's Dermatol. 2018; 4:27- 31.
4. Mruthyunjayappa S, Mahantappa H, Gopal MG, Venugopal SB. A Study of Histopathological Features in Patients Presenting withHyperpigmented Skin Lesions. Arch Med Health Sci. 2016;4:189-95.
5. Mehar R, Jain R, Kulkarni CV, Narang S, Meena M, Patidar H. Histopathological study of dermatological lesions- A retrospective approach. Int J Med Sci Public Health. 2014;3:1082-5.
6. Kortifis C, Gregoriou S, Antoniou C, Katsambas AD, Rigopoulos D. "Skin biopsy in the context of dermatological diagnosis: A retrospective cohort study". Dermatol ResPract.2014;2014:734906.
7. Tayal DA, Bharti DR, Kumar DH. Study of histomorphological pattern in non-infectious erythematous papulosquamous lesion of skin attertiary Care Hospital, Up. IOSR-JDMS. 2019;18(6):19-24.
8. Adhikari RC, Shah M, Jha AK. Histopathological spectrum of skin diseases in a tertiary skin health and referral centreJ Pathol Nep. 2019;9(1):1434-40. DOI: https://nepjol.info/index.php/JPN/article/view/23172
9. Chalise S, Dhakhwa R, Pradhan SB. Histopathological Study of Skin Lesions in a Tertiary Care Hospital: A Descriptive Cross-sectional Study. J Nepal Med Assoc. 2020 Apr 30;58(224):218-222. doi: 10.31729/jnma.4799. PMID: 32417857; PMCID: PMC7580462.
10. Bezbaruah R, Baruah M. Histopathological spectrum of skin lesions-A hospital based study. Indian J Appl Res. 2018;8:51-2
11. Mamatha K, Susmitha S, Patil V, Sathyashree KV, Disha BS. Mamatha K, Susmitha S, Patil V, Sathyashree KV, Disha BS. Histopathological spectrum of dermatological lesions – An experience at tertiary care centre. IP Arch CytolHistopathol Res. 2018;3(2):83-88. DOI: https://doi.org/10.18231/2456-9267.2018.0017
12. Aslan C, Goktay F, Mansur AT, Aydingoz IE, Gunes P, Ekmekci TR. "Clinicopathological consistency in skin disorders: A retrospective study of 3949 pathological reports". J Am Acad Dermatol. 2012;66:393-400.
13. Bin Yap FB. "Dermatopathology of 400 skin biopsies from Sarawak". Indian J Dermatol VenereolLeprol. 2009;75:518 –19
14. Gupta P, Karuna V, Grover K, Rathi M, Verma N, The histopathological spectrum of skin diseases with emphasis on clinicopathological correlation: A prospective study. IP J DiagnPathol Oncol 2018;3(2):91-95. DOI: https://doi.org/10.18231/2581-3706.2018.0020