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Clinico-Histopathological Consistency in Dermatological Disorders in a Tertiary Care Hospital of Kathmandu

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Abstract

Introduction: A skin biopsy for histopathological examination is one of the most reliable investigations for confirming clinical diagnosis. When there is alignment of clinical and histopathological diagnosis, it demonstrates clinico-histopathological consistency. There is limited reported data on clinico-histopathological concordance in the context of Nepal.

Objectives: To determine the consistency of clinical and histopathological diagnosis of dermatological disorders.

Materials and Methods: A retrospective study was conducted on 551 patients who underwent skin biopsy at the Department of Dermatology and Venereology, Tribhuvan University Teaching Hospital, for a period of 1 year. Both inpatients and outpatients who had undergone a skin biopsy were included in the study. Demographic data, clinical and histopathological diagnoses were noted on a proforma sheet. Histopathological diagnoses, both definitive and descriptive, were deemed consistent when they aligned with the clinical diagnoses. Conversely, if either definitive or descriptive histopathological diagnoses were not concordant with the clinical diagnoses, they were categorized as inconsistent.

Results: The mean age of patients was 41.42 (±18.42) years. The male to female ratio was 1:1.5. Out of 551 cases who underwent skin biopsy, clinico-histopathological consistency was found in 64.43% of cases (355), whereas clinico-histopathological inconsistency was present in 35.57% (196). The maximum concordance was present in eczematous disorders (58.06%), followed by immunobullous disorders (47.22%), and vasculitis (45.45%).

Conclusion: The overall clinico-histopathological consistency was 64.43%. Both experienced dermatologists and pathologists need to assist each other in providing a better understanding of the diagnostic process. This study emphasizes need for this cooperation and will aid in evaluating clinico-histopathological consistency.

Keywords: Clinical Diagnosis; Clinico-Histopathological Consistency; Histopathological Diagnosis; Skin Biopsy

Introduction

Skin problems are one of the most common health problems in our country. The overall prevalence of skin diseases is around 25%. [1] Skin diseases contribute to a significant burden in the global context of health. [2] The majority of dermatological problems are diagnosed clinically, while some diseases need additional investigations. Despite adequate knowledge, it is not easy to reach a definitive diagnosis for several dermatological diseases because of diverse clinical findings. Skin biopsy is an important investigation to confirm the diagnosis, to exclude one condition from another and to investigate a poor response to therapy. [3] It is important to have clinico-pathological consistency for the correct management of a patient.

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But the clinical and histopathological diagnoses are not always concordant, which can lead to misdiagnosis and incorrect treatment. Dermatologists and pathologists should be coordinated for better consistency of clinical and histopathological diagnoses. [4]

There can be various factors that can lead to clinico-histopathological inconsistencies, like inadequate clinical information provided in the histopathological requisition forms, biopsy technique, and site chosen for biopsy. [5]

Therefore, sufficient clinical information should be provided for a consistent histopathological diagnosis. [6]

The main objective of this study was to identify the common clinical diagnoses and histopathological diagnoses of patients who underwent skin biopsy and to determine the consistency between clinical and histopathological diagnoses in different skin disease categories. It emphasizes the need for the cooperation of dermatologists and pathologists that will aid in disease management.

Materials and Methods

It was a hospital-based retrospective study compiling data from all the inpatients and outpatients who underwent skin biopsies between January 1st 2023 to December 31st 2023. The study was conducted after obtaining approval from the Institutional Review Committee, , Institute of Medicine. The data comprised the patient's age, gender, clinical differential diagnoses, and histopathological diagnosis. The clinical diagnoses and histopathological diagnoses were provided by the dermatologists and pathologists, respectively. These data were collected from the biopsy registry maintained in the minor operation theater maintained by the assisting residents in the Department of Dermatology and histopathological records from the Department of Pathology. All the patients with incomplete data in the registry and cases with inadequate biopsy samples were excluded from this study. The clinical and histopathological consistency and inconsistency were assessed by dividing them into two broad groups:

1. **Clinical diagnosis consistent with pathological diagnosis (clinico-histopathological consistency):** The consistency between clinical and pathological diagnoses was classified as definitive or descriptive. Concordance was said to be achieved when the definitive diagnosis provided by the pathologist aligns with one of the potential diagnoses suggested by the dermatologist. Descriptive consistency, on the other hand, occurs when the pathologist merely describes observed histopathological findings that align with the histopathological profile of one of the dermatologist's listed differentials.
2. **Clinical diagnosis inconsistent with pathological diagnosis (clinico-histopathological inconsistency):** The clinico-pathological discordance was divided into two groups. It was considered inconsistent when the pathologist provided a definitive diagnosis that did not match any of the clinical differentials listed by the dermatologist. Furthermore, descriptive discordance involved reports where the pathologist only mentioned histopathological findings that did not match the histopathological profile of any clinical diagnosis listed by the dermatologist.

All skin disorders were grouped as per Tables 1 and 2. The clinical and histopathological diagnoses for each case were further categorized into different disease categories. The diseases that were not part of the mentioned categories were taken under the miscellaneous category. When histopathological diagnoses were not indicative of the mentioned clinical differentials and were inconclusive of any diagnosis , they were listed under an unspecific heading. Within each disease category, if the clinical differential diagnosis matched the histopathological diagnosis, it was considered concordant.

The concordance and discordance rates were calculated for the different groups of disorders. In the case of multiple histopathological differential diagnoses, the first differential diagnosis was taken as the final histopathological diagnosis. If the histopathological diagnosis aligned with one of the clinical differential diagnoses, the case was considered to exhibit overall clinico-histopathological consistency. The clinical differential diagnoses of a case were in the same or different disease categories. If there were two or more clinical differential diagnoses of the same disease category and one of them aligned with the histopathological diagnosis, it was documented as both consistent and inconsistent for that particular disease category. The data was collected via Microsoft Excel and analyzed using IBM Statistical Package for Social Sciences 26.0 for Windows. Categorical and quantitative variables were presented as frequencies and percentages.

Results

Out of 551 cases, there were 334 (60.62%) female patients and 217 (39.38%) males. The male -female ratio was 1:1.5. The mean age of patients was 41.42 (±18.42) years. Around one-fifth (20.15%) were under the age group of 30-39 years .

Table 1 presents data on the distribution of cases according to clinical diagnosis. The clinical diagnoses were classified into 16 broad groups. Among them, the three most prevalent clinical diagnoses were benign tumors (14.23%), granulomatous disorders (14.23%), and papulosquamous disorders (14.13%). Other notable clinical diagnoses were eczematous disorders (9.32%), pigmentary disorders (8.82%), malignant tumors (7.31%), and connective tissue

disorders (4.91%). There were 1 to 5 clinical differential diagnoses mentioned for a single patient. In 254 cases, only one clinical diagnosis was specified. Two differential clinical diagnoses were given in 184 cases, three clinical differential diagnoses in 79 cases, four clinical differential diagnoses in 31 cases, and five differential clinical diagnoses in 3 cases. The mean number of clinical differential diagnoses is 1.81± 0.17.

Table 2 shows that the maximum number of histopathologically diagnosed cases was of benign tumors (16.88%), followed by eczematous disorders (12.70%). Additionally, papulosquamous disorders (8.35%), granulomatous disorders (6.72%), and pigmentary disorders (6.53%) had significant findings.

SN	Clinical Diagnoses	Frequency	Percentage
1	Benign Tumors	142	14.23
2	Granulomatous Disorders	142	14.23
3	Papulosquamous Disorders	141	14.13
4	Eczematous Disorders	93	9.32
5	Pigmentary Disorders	88	8.82
6	Malignant Tumors	73	7.31
7	Connective Tissue Disorders	49	4.91
8	Vasculitis	44	4.41
9	Immunobullous Disorders	36	3.61
10	Panniculitis	31	3.11
11	infection	26	2.61
12	Cicatricial Alopecia	24	2.40
13	Cornification Disorders	18	1.80
14	Reactive Erythema	13	1.30
15	Neutrophilic Dermatoses	8	0.80
16	Others	70	7.01
	Total	998	100.00

Table 1: Distribution of cases according to clinical diagnosis

SN	Histopathological Diagnoses	Frequency	Percentage
1.	Benign Tumors	93	16.88
2.	Eczematous Disorders	70	12.70
3.	Papulosquamous Disorders	46	8.35
4.	Granulomatous Disorders	37	6.72
5.	Pigmentary Disorders	36	6.53
6.	Immunobullous Disorders	22	3.99
7.	Vasculitis	22	3.99
8.	Malignant Tumors	21	3.81
9.	Cicatricial Alopecia	16	2.90
10.	Panniculitis	15	2.72
11.	Connective Tissue Disorders	15	2.72
12.	Infection	8	1.45
13.	Cornification Disorders	7	1.27
14.	Reactive Erythema	5	0.91
15.	Neutrophilic Dermatoses	2	0.36
16.	Unspecific	80	14.52
17.	Miscellaneous	56	10.16
	Total	551	100.00

Table 2: Distribution of cases according to histopathological diagnosis

	n	%
Clinico-histopathological consistency (definitive and descriptive)	355	64.43%
Clinico-histopathological inconsistency (definitive and descriptive)	196	35.57%

Table 3: Overall clinico-histopathological consistency and inconsistency

SN	Clinical Diagnoses	Clinicopathological Consistency	Clinicopathological Inconsistency
1.	Eczematous Disorders	54 (58.06%)	39(41.94%)
2.	Immunobullous Disorders	17 (47.22%)	19(52.78%)
3.	Vasculitis	20 (45.45%)	24(54.55%)
4.	Panniculitis	14 (45.16%)	17(54.84%)
5.	Benign Tumors	60 (42.25%)	82(57.75%)
6.	Pigmentary Disorders	35 (39.77%)	53(60.23%)
7.	Cornification Disorders	7 (38.89%)	11(61.11%)
8	Connective Tissue Disorders	19 (38.78%)	30(61.22%)
9.	Cicatricial Alopecia	8 (33.33%)	16(66.67%)
10.	Papulosquamous Disorders	46 (32.62%)	95(67.38%)

Table 4: Clinico-histopathological consistency and inconsistency in 10 most common skin disease categories

Among the 551 cases that underwent skin biopsy, clinical and histopathological findings aligned in 64.43% of cases (355), while inconsistency between clinical and histopathological findings was observed in 35.57% (196) of cases.

Among reports demonstrating clinicopathological consistency, the pathological diagnosis aligned with

the initial clinical diagnosis in 73.80% of cases, with the second clinical diagnosis in 21.97% of cases, and with the third clinical diagnosis in 3.66% of cases.

Table 4 shows the clinico-histopathological consistency and inconsistency in different categories of clinical diagnoses. The clinico-histopathological consistency among the clinical diagnoses was highest in eczematous disorders (58.06%), followed by immunobullous disorders (47.22%), and vasculitis (45.45%). The maximum clinico-histopathological inconsistency was seen in infection (80.77%).

Discussion

A skin biopsy is an important investigation that aids in the diagnosis of dermatological disorders. Clinical presentations of skin disorders can be variable, which leads to numerous clinical differential diagnoses. A co-relation between clinical and histopathological diagnosis is required for prompt management of patients. In our study duration, 24145 patients attended the outpatient department of dermatology, and around 551 skin biopsies were performed. The percentage of skin biopsies performed was 2.28%.

The overall concordance between clinical and pathological diagnoses in our study was 64.43%, which aligns with findings from other research. In an observational study by Mahmud et al., in 630 patients, 68.22% of the diagnosis was histopathologically consistent with the clinical diagnosis.[4] In a retrospective study by Aslan et al., the pathological diagnoses were consistent with the clinical diagnoses in 76.8% cases, and they were inconsistent in 23.2% cases.[7] Balasubramanian et al., found a concordance of 59.8% in their audit of 2955 biopsy specimens.[5] Additionally, studies from Saudi Arabia (4268 cases) and Greece reported overall concordance rates of 76% and 68%, respectively. [8,9] A study in India, showed the overall concordance between clinical and pathological diagnoses to be 70.48%. [10] In a study conducted by Rajaratnam et al., accurate diagnoses were achieved at a rate of 55% without prior knowledge of the patient's clinical history. [11] However, this rate increased to 78% after obtaining clinical information. Similarly, in our study, patients with adequate descriptive clinical knowledge exhibited a higher rate of clinicopathological consistency. In a study by Mahmut Sami et.al., the clinicopathological correlation was seen in 79.1%.[12] Similarly, a study by Varughese et al., showed clinicopathological correlation in 54% of cases.[13] A higher rate of correlation between clinical and histopathological diagnosis of 85.8% was observed in a study by Gupta P. et al.,.[14] In a similar study conducted in Nepal by Jha et al., the overall concordance between clinical and histopathological diagnosis was found to be 76.5%. [15]

The pathological diagnosis corresponded to the initial clinical diagnosis in 73.80% of cases, to the second clinical diagnosis in 21.97% of cases, and to the third clinical diagnosis in 3.66% of cases. These findings closely mirror those reported by Aslan et al., [7] where the first clinical diagnosis matched the histopathological diagnosis in 68.8% of cases, the second clinical diagnosis in 22.0% of cases, and the third clinical diagnosis in 7.3% of cases. This indicates that clinical diagnoses on the pathology requisition form were arranged according to the hierarchy of importance.

In the present study, the majority of biopsies were done for benign tumors, followed by eczematous disorders and papulosquamous disorders. The results were similar to a study by Mahmut et.al., where the most common diseases biopsied were tumors followed by papulosquamous diseases.[12] A study by Gupta P. et al., [14] showed the maximum histopathological diagnosis of infectious disorders followed by papulosquamous disorders and benign tumors. Inflammatory skin disorders were the maximum histopathological diagnosis in a study by Talwar A et al. [10]

The maximum clinico-pathological concordance was found in eczematous disorders (58.06%), followed by immunobullous disorders (47.22%), and vasculitis (45.45%). The most clinico-histopathological inconsistency was seen in infection (80.77%). In study by Mahmud et al, [4] the highest clinico-pathological concordance was present in vesiculo-bullous disease (93.33%). Talwar et al., reported the maximum consistency being in perforating disorders and deposition disorders (100%) followed by pigmentary disorders (92.3%). [10]

Varughese et al., found maximum clinico-histopathological concordance in infectious skin diseases (86.8%) followed by vasculitis (83%) and granulomatous skin lesions (80%). [13] Aslan et al., reported a high level of concordance between clinical diagnosis and pathological diagnosis for connective tissue diseases (96.8%), metabolic diseases (95.1%), bullous diseases (94.6%) and inflammatory dermatoses (93.9%). [7]

The histopathological request forms possessing adequate descriptive clinical knowledge exhibited greater consistency in clinicopathological correlation. When clinicians mention diseases from different groups and the results are found to be discordant, it typically means there is disagreement or inconsistency among the diagnoses or assessments made by the clinicians. Some diseases may present with overlapping symptoms or be part of a spectrum of related conditions, making diagnosis challenging and prone to variation. Addressing discordant results often requires collaboration among clinicians and pathologists, review of available information and consideration of further diagnostic tests to arrive at a consensus diagnosis.

The limitation of our study is that there might have been a loss of data due to its retrospective nature, and the data was from a limited period.

Conclusion

The current research demonstrates a concordance rate of 64.43%, highlighting the important role of histopathology as a cost-effective diagnostic tool in accurately diagnosing many dermatological disorders. Conducting regular audits and organizing clinico-pathological meetings can identify and address any shortcomings, ultimately leading to improved concordance rates.

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