A Retrospective Study to Evaluate the Clinicopathological Correlation of Skin Biopsies Done in a Tertiary Care Centre in South India

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Abstract

Background: Skin biopsy is one of the most commonly used diagnostic tests in dermatology to achieve accurate and rapid diagnosis. However, it is important to incorporate detailed clinical information for histopathological evaluation.

Aims: To retrospectively evaluate the quality of data entered in the histopathology request forms and biopsy reports and to investigate the consistency between clinical and pathological diagnoses in the reported biopsy specimens.

Methods: A retrospective analysis of histopathology request forms and their corresponding skin biopsy reports done over a period of two years was undertaken. Details like clinical history, examination findings, biopsy site and technique, purpose of biopsy, number of differential diagnosis, microscopic description, pathologist's diagnosis, duration of reporting and level of clinicopathological correlation were analyzed. Statistical analysis was carried out for two-tailed significance, and $p < 0.05$ was considered significant.

Results: A total of 456 biopsy reports were analyzed. On assessing the clinicopathological correlation, we observed a concordance rate of 70.2% and discordance rate of 29.8%. No correlation was observed between clinicopathological consistency and inadequate clinical history, inadequate examination findings and number of differential diagnosis. However, correlation was observed between clinicopathological consistency and inadequate clinical history and examination findings, when both were clubbed together. Clinicopathological consistent reports had a significantly higher rate of definitive pathologist's diagnosis and a significantly shorter duration for issuing the histopathology reports.

Conclusions: Several shortcomings were identified in the histopathology request forms during the review. Standardising the methodology of including all details in histopathology request forms would be useful.

Key words: Biopsy; Clinicopathological correlation; Consistency.

Introduction

Histopathology remains the gold standard for most dermatologic diagnoses. Dermatopathology plays an important and integral role in dermatology, aiding in the confirmation of clinical suspicions, helping to arrive at a diagnosis or to narrow the differential diagnoses in challenging cases.[1] However, every specimen submitted for histological diagnosis should be accompanied by detailed clinical information, including a differential diagnosis. The histopathologist's ability to render an accurate diagnosis often depends on the available clinical information, and clinicopathological correlation is

the key to providing optimal patient care. Hence, the histopathology request form becomes the crucial link between the treating dermatologist and the pathologist. Studies auditing the consistency between clinical and histopathological diagnoses of skin disorders are few.[2,3] An audit is a quality improvement process that seeks to improve the quality of existing healthcare facilities through a systematic review of care against explicit criteria and implementation of changes for its betterment.[4] We sought to evaluate the correlation between the clinical diagnoses rendered on the biopsy request form with the subsequent histological diagnoses and factors affecting consistency by reviewing the quality of data included in the dermatopathology request forms and reports in this retrospective study.

Materials and Methods

This study was conducted at a tertiary care referral hospital in South India. A retrospective analysis of histopathology request forms and their corresponding skin biopsy reports done over a period of two years (January 2014 to December 2015) in the Department of Dermatology was undertaken. Histopathology request forms and reports in the Department of Pathology and biopsy records in the Department of Dermatology were reviewed. Two histopathologists with experience in Dermatopathology for more than ten years were reviewing the slides. Each patient's age and gender were recorded. Other details like clinical history, examination findings, biopsy site and technique, purpose of biopsy, number of differential diagnosis, microscopic description, pathologist's diagnosis, duration of reporting and level of clinicopathological correlation were analyzed. The clinical findings were reviewed after the histology diagnosis and histology diagnosis reviewed in relevant cases. The relationships between clinical and pathological diagnoses were studied in 4 groups, namely: (1) definite pathological diagnoses consistent with the clinical diagnoses, (2) descriptive pathological diagnoses consistent with the clinical diagnoses, (3) definite pathological diagnoses inconsistent with the clinical diagnoses, and (4) descriptive pathological diagnoses inconsistent with the clinical diagnoses. The first two groups were taken as evidence of clinicopathological consistency, whereas the latter two groups were taken as evidence of clinicopathological inconsistency between the diagnoses. The data were analyzed using IBM SPSS statistics version 20 for windows. All categorical and quantitative variables were presented as frequencies and percentages and were compared by chi-squared test for trend. All statistical analysis was carried out for two-tailed significance, and $p < 0.05$ was considered significant.

Results

A total of 456 biopsy reports were analyzed, among them 258 (56.6%) were of male patients and 198 (43.4%) were of female patients. The sample size was small considering the fact that, routinely biopsies were not done for all clinically evident cases. Biopsies were done only in suspected cases where clinical diagnosis was not straightforward. Only in Hansen's disease biopsies were done in all cases before starting them on treatment. Mean age recorded in 456 reports was 36.5 years. Proportion of biopsies from different body sites were: lower limbs 32%, upper limbs 26%, back 20%, chest and abdomen 15%, head and neck 6% and mucosa 1%. The biopsies were categorized by type as follows: 444 punches, 10 excisional, and 2 incisional. Majority (452, 99.1%) of the biopsies were performed for diagnostic purposes, and the remaining (4, 0.9%) were done for both diagnostic and therapeutic purposes. Out of these four cases, two cases were melanocytic naevus and one case each of dermatofibroma and pilomatricoma. In these cases, clinicopathological correlation was required to rule out any malignancy and also to confirm the diagnosis.

The deficiencies observed in the histopathology request forms included the following: inadequate clinical history in 36 (7.9%) forms, inadequate examination findings in 86 (18.9%) forms and site of biopsy not mentioned in 10 (2.2%) forms. The number of clinical differential diagnosis varied between 1 and 7. No correlation was observed between clinicopathological consistency and inadequate clinical history, inadequate examination findings and number of differential diagnosis (Table 1). However, when we clubbed together the inadequate clinical history and examination findings, the association between clinicopathological consistency and inadequate clinical details was statistically significant (Table 1). Among 48 biopsies with discordant histopathology reports and inadequate clinical history and clinical findings, the histological diagnosis changed in 10 (20.8%) biopsies after providing the adequate clinical history and findings.

The association between clinicopathological consistency and adequate clinical details for individual groups of disorders was found to be statistically significant (Table 2).

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Also, when we separated the definitive diagnosis and descriptive reports in the concordant group, the association between adequate clinical details and definitive diagnosis was statistically significant (Table 3).

Definite diagnosis was recorded in 336 (73.7%) reports, and descriptive diagnosis in 120 (26.3%) reports. Of the 456 reports examined, 296 (64.9%) had a definite pathological diagnosis consistent with the clinical diagnosis, 24 (5.3%) had a

Table 1:

Factors	Biopsy report Concordant n (%)	Discordant n (%)	Total	*p* value
Clinical history				
Adequate	296 (70.5)	124 (29.5)	420	0.63
Inadequate	24 (66.7)	12 (33.3)	36	
Examination findings				
Adequate	256 (69.2)	114 (30.8)	370	0.33
Inadequate	64 (74.4)	22 (25.6)	86	
History and Examination clubbed together				
Adequate	256	88	344	0.014
Inadequate	64	48	112	
Number of diagnosis				
≤2	230 (71)	94 (29)	324	0.55
>2	90 (68.2)	42 (31.8)	132	
Microscopic details				
Mentioned	320 (70.2)	136 (29.8)	456	0.001
Not mentioned	0	0	0	
Pathologists diagnosis				
Definitive	296 (88.1)	40 11.9)	336	0.001
Descriptive	24 (20)	96 (80)	120	
Reporting time				
≤1 week	228 (74)	80 (26)	308	0.009
>1 week	92 (62.2)	56 (37.8)	148	

Table 2: Correlation of clinical details in different group of disorders

Group of disorders	Clinical details	Concordant	Discordant	Total	*p* value
Hansen's disease	Adequate	36	18	54	0.003
	Inadequate	4	12	16	
Psoriasis	Adequate	30	14	44	0.03
	Inadequate	6	10	16	
Lichen planus and lichenoid disorders	Adequate	22	12	34	0.12
	Inadequate	6	12	18	
Connective tissue diseases	Adequate	11	7	18	0.02
	Inadequate	1	7	8	
Vasculitis	Adequate	13	3	16	0.005
	Inadequate	1	5	6	
Pigmentary diseases	Adequate	6	4	10	0.02
	Inadequate	2	6	8	
Vesiculobullous disorders	Adequate	10	1	11	0.03
	Inadequate	2	3	5	
Granulomatous diseases	Adequate	7	2	9	0.009
	Inadequate	0	4	4	
Cutaneous malignancies	Adequate	2	4	6	0.10
	Inadequate	2	0	2	
Adnexal tumors	Adequate	2	4	6	0.35
	Inadequate	0	2	2	

descriptive pathological diagnosis consistent with the clinical diagnosis, 40 (8.8%) had a definite pathological diagnosis inconsistent with the clinical diagnosis, and 96 (21.1%) had a descriptive pathological diagnosis that was inconsistent with the clinical diagnosis.

Time taken for issuing the histopathology report was ≤ 7 days in 316 (69.3%) forms and > 7 days in 140 (30.7%) forms. On assessing the clinicopathological correlation, we observed a concordance rate of 70.2% (320 reports) and discordance rate of 29.8% (136 reports). Maximum concordance was observed among vesiculobullous and vasculitic disorders and maximum discordance among adnexal tumours, pigmentary disorders and cutaneous malignancies. Cutaneous malignancies reported were melanocytic melanoma (1 case), squamous cell carcinoma (2 cases), basal cell carcinoma (1 case) and adenexal carcinoma (0). There were 18 cases in the benign neoplasia group with a concordance of 37.5%. Clinicopathological concordance among various groups of disorders are summarized in Table 4.

Table 3: Comparision of clinical details of concordant reports between definitive diagnosis and descriptive reports

Clinical details	Definitive diagnosis	Descriptive reports	p value
Adequate	286	10	
Inadequate	10	14	<0.001
Total	296	24	

Table 4: Group of disorders and rates of clinicopathological consistencies

Group of disorders	Number of biopsies	Clinicopathological concordance (%)
Hansen's disease	70	57.1
Psoriasis and psoriasiform dermatitis	60	60
Lichen planus and lichenoid disorders	52	57.7
Connective tissue diseases	26	46.2
Vasculitis	22	63.6
Pigmentary diseases	18	44.4
Vesiculobullous disorders	16	75
Granulomatous diseases	13	53.8
Cutaneous malignancies	8	50
Adnexal tumors	8	25

Table 5: Comparison of level of clinicopathological correlation of various groups of disorders in different studies

Group of disorders	No. of biopsies in our study	Concordance (%)	Other studies	No. of biopsies in their study	Concordance (%)
Hansen's disease	70	57.1	Bhatia et al.[16]	1351	89
			Moorthy et al.[15]	372	62.6
			Rao et al.[18]	108	95
			Balasubramanian et al.[3]	454	58.8
			Shivaswamy et al.[17]	182	74.7
Psoriasis and psoriasiform dermatitis	60	60	Mehta et al.[14]	100	81
			Aslan et al.[2]	Not mentioned	96.8
			Balasubramanian et al.[3]	274	68.2
Lichen planus and lichenoid disorders	52	57.7	Aslan et al.[2]	Not mentioned	94.6
			Balasubramanian et al.[3]	286	70.6
Vasculitis	22	63.6	Khetan et al.[20]	80	77
			Balasubramanian et al.[3]	160	56.3
Pigmentary diseases	18	44.4	Aslan et al.[2]	202	87.6
Vesiculobullous disorders	16	75	Aslan et al.[2]	Not mentioned	94.6
			Balasubramaniam et al.[3]	204	71.1
Cutaneous malignancies	8	50	Aslan et al.[2]	Not mentioned	89.6
			Balasubramaniam et al.[3]	55	52.7
			Tan et al.[7]	78	91

Further we categorized our cases into broad groups such as inflammatory and neoplastic. In the inflammatory group, there were 432 cases with a concordance of 71.8% and in the neoplastic group there were 24 cases with a concordance of 41.7%.

Clinicopathological consistent reports had a statistically significant (p = 0.001) higher rate of definitive pathologist's diagnosis and a statistically significant (p = 0.009) shorter duration for issuing the histopathology reports (Table 1).

Discussion

Skin biopsy is one of the most commonly used diagnostic tests in dermatology and an invaluable tool in the dermatologist's diagnostic armamentarium.[3] Previous studies have observed that providing a good clinical description in histopathology requisition forms increased the diagnostic accuracy.[2,5,6] Tan et al.[7] in their study on inflammatory and malignant disorders have highlighted the utility of the Clinico-Pathological Correlation (CPC) score, and demonstrated how this scoring system could provide a form of communication between clinicians and dermatopathologists. In our study, no significant association was observed between clinicopathological consistency and inadequate clinical history and examination findings provided. Similar findings have been reported by Balasubramanian et al.[3] in their retrospective audit of 3006 pathology requisition forms and reports. However, when we clubbed together the inadequate clinical history and examination findings, the association between clinicopathological consistency and inadequate clinical details was statistically significant. Among 48 biopsies with discordant histopathology reports and inadequate clinical history and clinical findings, the histological diagnosis changed in 20.8% of biopsies after providing adequate clinical history and findings. This may be due to the fact that, the histological or tissue responses may be similar or overlap and the histological diagnosis changed after providing the necessary clinical details. These findings reiterate the importance of filling the requisition forms with detailed clinical history and examination findings.

Aslan et al.[2] in their study reported that no correlation was observed between clinicopathological consistency and type of biopsy or number of differential diagnosis. Our results also did not show any correlation with respect to number of differential diagnosis and majority of our biopsies were punch biopsy.

Our study demonstrated a clinicopathological concordance rate of 70.2% and discordance rate of 29.8% in diagnosing dermatologic diseases. This correlates well with literature accuracy rates where Balasubramanian et al.[3] and Aslan et al.[2] found 59.8% and 76.8% concordance rate, and 30.9% and 23.2% discordance rates respectively. Both these studies evaluated skin biopsies of all types of dermatological diseases. The diagnostic accuracy rate in prior clinicopathological consistency studies looking at single lesions, benign tumors and malignancy such as basal cell carcinoma and melanoma, has ranged from 44% to 96.5%.[8-13]

Comparision of clinicopathological concordance among various groups of dermatological disorders in our study with other studies are summarized in Table 5. Psoriasiform and lichenoid disorders had a low degree of concordance in our study which was relatively close to another Indian study by Balasubramanian et al.[3] However, studies by Mehta et al.[14] and Aslan et al.[2] had a higher degree of concordance in these groups of disorders. This dichotomy in concordance rates could be due to improper biopsy site selection, lack of standardized criteria for reporting and could be that biopsies were done only in suspected but not clinically evident cases. Also, in other studies, biopsies could have been done in the clinically evident cases also for documentary evidence.[3]

Clinicopathological correlation in Hansens disease in our study (57.1%) was similar to that observed by Balasubrmanian et al.[3] (58.8%) and Moorthy et al.[15] (62.6%). However, higher clinicopathological concordance rates have been reported by Bhatia et al.[16] (69%), Shivaswamy et al.[17] (74.7%), and Rao et al.[18] (95%). Correlation was maximum in lepromatous leprosy followed by tubeculoid and borderline tuberculoid leprosy in our study, which is in agreement with those reported by Balasubramanian et al.[3], Shivaswamy et al.[17] and Bhatia et al.[16] Maximum correlation with borderline tuberculoid leprosy followed by borderline lepromatous type has been reported by Manandhar et al.[19] Discordance between clinical and histopathological diagnosis can be explained on the basis that generally the diagnosis is made on clinical grounds alone, awaiting histopathological confirmation. It is possible that there is an individual observer bias also. Variation in different studies may be related to different criteria used to select the cases: choosing the biopsy site, age of the lesion, morphology of the lesion, immunological and treatment status of the patient, retrospective versus prospective studies.

Clinicopathological correlation of cutaneous malignancies in our study was 50% which is almost similar to that reported by Balasubramanian et al. (52.7%).[3] On the contrary, Aslan et al.[2] and Tan et al.[7] have reported it to be 89.2% and 91% respectively. This could be because of the infrequent occurrence of skin cancers in the Indian subcontinent compared to white skinned individuals and our high index of clinical suspicion.

Concordance rate was minimum in adnexal tumors group (25%). This may be due to the fact that, these present with cutaneous/subcutaneous swellings and specific clinical diagnosis is difficult to make.

Balasubramanian et al.[3] documented that concordant reports had a significantly higher rate of definitive pathologist's diagnosis and a significantly shorter duration for issuing the histopathology reports. Our study also documented the same findings. This could be due to the fact that, when pathological diagnoses are inconsistent with the clinical diagnosis, the pathologist can apply additional procedures such as histochemistry, immunohistochemistry and serial sections to establish a definite diagnosis which may prolong the duration of the reports.

Limitation of this study was sampling bias, as all cases of Hansen's disease were preferentially biopsied whereas other diseases were biopsied only when there was clinical difficulty.

Conclusion

The rate of clinicopathological consistency in our study was 70.2%. Several inadequacies were identified in the histopathology request forms during the review. Review of discordant slides is required to reduce the clinic-pathological inconsistency. It would be useful to have a standardised histopathology request forms which includes all the clinical details. Also, a clinicopathological correlation scoring system would be beneficial in improving the communication between dermatologists and pathologists.

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