Original Article

Concordance of Dermatological Diagnosis with Pathological Diagnosis in Skin Biopsies: A Study from Kashmir.

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Abstract

Background

Skin biopsies are performed on selected patients by dermatologists to reach to conclusive diagnosis for patient management. Dermatologists and pathologists are interdependent on each other regarding clinical information provided by former and morphological description and diagnosis made by later to reach to the definitive diagnosis. But despite coordination between two specialties, not all skin biopsies result in definitive diagnosis.

Aim

This study was designed to define the role of skin biopsy in reaching conclusive diagnosis and evaluate concordance between the clinical diagnosis made by dermatologists and pathological diagnosis made by pathologists.

Methodology

This is a retrospective observational study which was conducted by reviewing the histopathological requisition forms of skin biopsies and their reports from archives of department of pathology, Sher-i-Kashmir Institute of Medical Sciences Medical College and Hospital, Bemina, Kashmir for period of three years from January 2017 to December 2019. During this period 366 skin biopsies were received and their forms were analyzed.

Results Our study found clinical and pathological concordance of 60.78% and efficacy of skin biopsy in diagnosis of skin disease to be70.5%.

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Introduction

Dermatologists diagnose most of skin disease on basis of history, clinical examination and biochemical investigations [1-3]. Pathologists rely on the clinical information and differential diagnosis recorded on the histopathology requisition forms to interpret the morphology of skin biopsy. Treating dermatologists depend on reporting pathologist for diagnosis while reporting pathologists depend on the treating dermatologists for how complete and accurate information he can provide on the requisition form to enable pathologist to reach to conclusive diagnosis on biopsies [4-6].

This study is designed to define the role of skin biopsy in reaching conclusive diagnosis and the concordance between the clinical diagnosis made by dermatologist and pathological diagnosis made by pathologist. To our knowledge no such study has been done from Kashmir valley prior to it. Also our institute serves as one of the two institutes in Kashmir valley having post graduate departments of pathology as well as

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Keywords

Concordance, dermatological, histopathological, Skin biopsy

dermatology and therefore justifying the reason to present concordance between two departments as symbol of team work for better patient care.

Material and Methods

Our study was conducted in department of pathology in a tertiary care teaching hospital, Sher-i -Kashmir institute of medical sciences medical college and hospital at Bemina. This retrospective study was conducted by reviewing the histopathological requisition forms of skin biopsies and their respective reports from archives of our department for period of three years from January 2017 to December 2019. During this period 366 skin biopsies were received and their forms were analyzed. All the clinical details mentioned on the forms which included age, sex, clinical presentation, differential diagnosis and site of the biopsy were recorded. The histopathological report prepared by the pathologist was also noted and its correlation with any of clinical differential diagnosis was recorded. Thereafter, the pathological diagnosis was evaluated for concordance with clinical diagnosis and grouped into following six groups;

1. Group 1: pathological diagnosis was consistent with clinical diagnosis.
2. Group2: descriptive pathological report suggestive of clinical diagnosis.
3. Group 3: descriptive pathological report neither favoring clinical diagnosis nor any definitive diagnosis.
4. Group4: definitive pathological diagnosis but not consistent with clinical diagnosis.
5. Group 5: inadequate biopsy sample
6. Group 6: No clinical diagnosis mentioned.

Group 1 and 2 were considered concordant with clinical diagnosis while group 3 and, 4 were considered discordant while group 6 was excluded due to lack of clinical information. Skin biopsies in groups 1, 2 and 4 were helpful in reaching to conclusive diagnosis. Descriptive statistical analysis was done on SPSS version 16.

The study was conducted while maintaining ethical principles of medical research on human beings as per the declaration of Helsinki 2013. The confidentiality of patients was maintained. Institutional ethical approval was obtained before conducting this study.

Results

Total of 366 cases were analyzed in this study, out of which 141 were men and 225 were females making the male: female ratio of 0.63:1. The age range was wide among both the genders which for females were from 19 months to 80 years while for males it was 2 years to 82 years. The group wise numbers of cases are presented in Table 1. The group 1 cases which included the cases showing pathological diagnosis consistent with clinical diagnosis were found to be 145(39.6%), while as group 2 cases in which pathologist gave descriptive report with morphology favoring clinical diagnosis included 72 cases (19.7%). These two groups were considered concordant with regard to clinical diagnosis and pathological diagnosis. The group 3 which included the cases in which pathologist gave descriptive report which did not favor any of the clinical differential diagnosis mentioned on requisition form had 92 cases (25.1%). The group 4 cases in which the pathologist had reached to conclusive diagnosis which however did not match any of the clinical differential diagnosis had 36 cases (0.98%). The group 5 biopsies which on microscopic examination by pathologist were declared inadequate for evaluation included 11 cases (0.03%). The group 6 included cases wherein requisition form had no clinical detail about the diagnosis made by dermatologist and there were 9 such cases (0.024%). While estimating the concordance, the group 6 cases were excluded as they lacked any information regarding clinical diagnosis and therefore, clinical and pathological correlation could not be established. However, group 5 cases were included as they were declared microscopically inadequate by pathologist.

Table 1: Distribution of cases in different groups

Serial number of cases	Group	Definition	Number
1	Group 1	Concordant	145
2	Group 2	Descriptive concordant	72
3	Group 3	Descriptive ,no definitive diagnosis, discordant	92
4	Group 4	Discordant but definitive	37
5	Group 5	Inadequate biopsy, discordant	11
6	Group 6	No clinical diagnosis mentioned	09
	Total		366

Group 1 and group 2 cases

The histomorphological spectrum of these cases was wide. They included different forms of inflammatory dermatosis . Morphea was reported in 29 cases, immunobullous lesions in 12 cases, dermatomyositis in 4, Discoid Lupus Erythematosus (DLE) in 8, lupus in 5, vasculitis in 8 cases, deposition disease in10 cases, granulomas in 23 cases and neoplastic pathology in 22 cases. The immunobullous lesion were diagnosed on basis of morphology only as our laboratory is resource limited and lacks facility of immunoflouresensce to confirm the diagnosis of immunobullous lesions. Almost all of the immunobullous cases were kept in

group 2 with descriptive morphology favoring clinical diagnosis. The availability of immunoflouresensce microscopy would have made confirmation of such lesions possible. The cases that were reported as deposition disease included amyloidosis (7 cases),collagenosis (1case),mucinosis(1 case)and calcinosis(1case). These also needed the availability of special stains like congo red , masson trichrome, alcian blue and von kossa for confirmation and due to their unavailability were given descriptive report with morphology favouring clinical diagnosis. The 21 granulomatous lesion diagnosed consisted of 10 infective lesions which include 5 cases of tuberculosis, 3 of leprosy and 2 of leishmaniasis. Other granulomatous lesions included 5 cases each of granuloma annulare and erythema nodosum along with one case of chelitis granulomatous. Three other nongranulomatous infective cases in this group included one case each of verruca vulgaris, molluscum contagiosum and fungal infection. The neoplastic pathologies put in group 1 included 6 cases of Bowens disease, 2 cases of squamous cell carcinoma,3 cases of basal cell carcinoma , one case of seborrheic keratosis and 10 cases of nevus. All the cases in this category were considered concordant and contributed in the confirmation of clinical diagnosis and hence helped in better patient care.

Group 3

This group included biopsies were pathologist gave descriptive report without attributing to any definitive diagnosis. This group included 93 cases. Among these most of cases were clinically diagnosed as one of the inflammatory dermatosis but failed to get confirmation by pathologist on histomorphology. About 15 cases in this group were thought to be neoplastic by dermatologist but could not get confirmation on histomorphology by pathologist. These included cases suspected of pagets disease, bowens disease, basal cell carcinoma, squamous cell carcinoma, nevus and seborrheic keratosis . Almost 10 cases clinically thought to be of infective etiology and 6 cases of non infectious granulomatous pathology could not be confirmed on biopsy by pathologist. The biopsies in this group were not of much help to the treating dermatologist and therefore did not prove helpful intreating patients. This group was considered discordant with regard to clinical diagnosis.

Group 4

This group included 37 cases which were given definitive diagnosis on histomorphology of skin biopsy by pathologist that was different from the clinical differential diagnosis made by dermatologist. The clinical versus pathological diagnosis is given in Table 2. Many of the lesion which were wrongly diagnosed by dermatologist were neoplastic lesion. Since, the diagnosis was definitive, therefore despite being discordant they were considered useful with regards to the patient management.

Group 5

They included the cases were skin biopsy was taken by dermatologist to confirm or get diagnosis however they were called inadequate by pathologist. They included cases which were clinically suspected of panniculitis but the biopsy lacked subcutaneous fat to confirm it or rule it out. They also included cases which after processing showed either strip of unremarkable epidermis or portion of unremarkable dermis. These cases were considered as discordant while analyzing concordance of dermatologist and pathologist. The biopsies of this group did not prove helpful for patient care.

Group 6

This included the biopsies wherein no clinical information regarding differential diagnosis was mentioned on requisition form. This group included 9 cases among which definitive diagnosis was given in four cases whereas in other five descriptive report on morphology was made. Hence, for four cases the skin biopsy proved to be helpful in this group. The pathological diagnoses made are given in table 3.

Analysis

While analyzing for concordance the skin biopsies in group 1 and 2 (145+72=217) were considered concordant as the diagnosis made by pathologist corresponded or morphologically favored one of the differential diagnosis made by dermatologist. The biopsies in group 3, 4 and 5 were considered discordant as the diagnosis made by pathologist was not one among the differential diagnosis set by dermatologist nor did the morphological description favor any of the differential diagnosis. The group 6 biopsies (9) were excluded while calculating concordance due to lack of clinical diagnosis on the requisition form. Out of 357 biopsies (excluding 9 cases of group 6), 217 showed concordance in the diagnosis made by pathologists and dermatologists, making total percentage of concordance as 60.78%.

For analysis of role of skin biopsy in reaching to conclusive diagnosis and contributing positively to patient management, all biopsies, (irrespective of the group they belong) those yielded definitive pathological diagnoses were considered. In this all group 1,2 and4 cases and the four cases with definitive diagnosis from group six were considered helpful. Therefore out of 366 biopsies, definitive diagnosis could be reached in 258 cases making percentage of 70.5%.Hence skin biopsy was helpful in 75.5% cases although cocordance

between diagnosis of pathologists and dermatologists was 60.78%.

Table 2: Pathological diagnosis versus clinical diagnosis in discordant cases.

Serial No	Pathological Diagnosis	Clinical Diagnosis
1.	Seborrheic keratosis.	Keratinous cyst
2	Rosacea	Basal cell carcinoma
3.	Leukocytoclastic vasculitis	Systemic lupus erythematosus
4.	Subacute spongiotic dermatosis	Dermatitis herpetiformis
5.	Piloleiomyoma	Sarcoidosis
6.	Seborrheic keratosis	Chronic actinic dermatitis
7.	Subacute spongiotic dematosis	Polymorphous light eruption
8.	Trichilemmoma	Melanoma
9.	Sebaceous gland hyperplasia	Basal cell carcinoma
10.	Unremarkable follicules	Alopecia aereta
11	Rosacea	Discoid lupus erythematosuss
12	Vasculitis	Toxic epidermal necrosis
13	Squamous cell carcinoma in situ	Melanoma
14	Fibrolipoma	Acrochordon
15.	Sebaceous gland hyperplasia	Basal cell carcinoma
16.	Rosacea	Basal cell carcinoma
17.	Keloid	Lichen amyloid
18.	Squamous cell carcinoma	Basal cell carcinoma
19.	Intradermal nevus	Actinic keratosis
20	Psoriasiform dermatitis	Pyoderma gangrenosum
21	Psoriasiform dermatitis	Hemangioma
22	Syringe cystadenoma papilliferumVerrucous	epidermal nevus
23	Intradermal nevus	Wart
24	Sebopsoriasis	Lichen planus
25	Basal cell carcinoma	Keratoacanthoma
26	Actinic keratosis	Seborrehic keratosis
27	Sweet syndrome	Erythema nodosum leprosum
28	Pemphigus foliaceous	Bullous pemphigoid
29	Seborrehic keratosis	Verruca
30	Glomus	Melanosis
31	Pilomatricoma	Hypertrophic scar
32	Intra dermal nevus	Dermatofibroma
33	Erythema chronicum migrans	Tuberculosis
34	Seborrheic keratosis	Verruca vulgaris
35	Bullous pemphigoid	Henoch schoennin pur[pura
36	Benign spindle cell tumor	Keloid
37	Psoriasis	Deep mycosiss

Discussion

Dermatologists face the challenging situations wherein they get into diagnostic dilemma about the disease condition of patient. In these cases skin biopsy, a simple and minimally invasive procedure facilitates the diagnosis and treatment. However the accuracy with which the pathologist can report skin biopsy depends on factors such as choice of the lesion for biopsy, technique of biopsy, clinical information provided and laboratory parameters like tissue fixation and tissue staining. Also diagnostic efficiency increases with application of adjuvant techniques like immuno fluorescence[4].

In our study of 366 cases, we found wide age range and male to female ratio of 0.63:1. In contrast to this males outnumber females in other studies from India [2]. In a study by Malik et al male to female ratio was 1.16:1[3].

Table 3: Pathological diagnosis in cases without clinical diagnosis on the requisition form.

Serial number	Pathological diagnosis
1	Molluscum contagiosum
2.	Descriptive
3.	Verruca vulgaris
4	Descriptive
5	Descriptive
6.	Lichen planus
7.	Descriptive
8.	Lichen planus
9.	Descriptive

We found that out of 366 cases definitive diagnosis could be reached in 258 cases hence confirming the efficacy of skin biopsy to be 70.5%. In our study the biopsies were categorized into six groups based on the agreement between clinical and pathological diagnosis. The group1 cases showing pathological diagnosis consistent with clinical diagnosis were found to be 145(39.6%), while as group2 cases in which pathologist gave descriptive report with morphology favoring clinical diagnosis included 72 cases (19.7%). The group 3, which included the cases in which pathologist gave descriptive report which did not favor any of the clinical differential diagnosis mentioned on requisition form, had 92cases (25.1%). The group 4 cases in which the pathologist had reached to conclusive diagnosis which however did not match any of the clinical differential diagnosis had 36 cases (0.98%). The group5 biopsies which on microscopic examination by pathologist were declared inadequate for evaluation included 11cases (0.03%). The group 6 included cases wherein requisition form had no clinical detail about the diagnosis made by dermatologist and they were 9 such cases 9(0.024%). In a similar study done by Malik et al [3] on 2216 skin biopsies, they had found the cases with total agreement with clinical diagnosis to be 45.67%, while as cases with descriptive report favoring morphology of clinical diagnosis to be 15.34%. This scenario matches with our study corresponding to group 1 and 2 cases which constituted 39.6% and 19.7% respectively. The summation of these two scenarios

which was considered concordant was 61.01% for their study which is comparable to 60.78% from our study. Further, in the study by Malik et al [3], the cases given only descriptive report which could neither match the morphology of clinical diagnosis not lead to any definitive diagnosis were 31.5%, the cases in which conclusive diagnosis was reached but did not match clinical diagnosis were 4.02%, while cases declared inadequate by pathologist were 3.29% and cases with no clinical details were 0.14%. These cases would correspond to group 3,4,5 and 6 of our study and they formed 25.1%,.98%,0.03% and 0.024% respectively in our study.

In one more study from India, 46.5% were given definitive pathological diagnosis consistent with clinical diagnosis, 21% were given descriptive pathological diagnosis consistent with clinical diagnosis, 6% had definitive pathological diagnosis inconsistent with clinical diagnosis while 6% had descriptive pathological diagnosis inconsistent with clinical diagnosis [7]. This study[7] concluded with overall concordance in clinical and pathological diagnosis of 67.5% which is slightly higher in comparison to our study (60.78%) and Malik et al[3](61.01%).

Relatively higher concordance is reported from international centers'. The study from Nepal on 111 cases showed concordance of 87% with fully and partially concordant cases being 27.93% and 50.45% respectively [2]. The large sample study from Saudi Arabia consisting of 4268 cases showed total concordance of 75.9% with fully and partially concordant cases being 28.3% and 47.6% respectively[8]. The studies from Greece and Turkey have shown pathological diagnosis concordant with clinical diagnosis to be68% and 76.8% respectively [4,9]. In a review study on clinical and histopathological diagnosis agreement in skin biopsy, the mean agreement was found to be 72.8%[10].

Conclusion

Our study found concordance of 60.78% and efficacy of skin biopsy in diagnosis to be70.5%. Many studies have focused on disease specific concordance between clinical and pathological diagnosis which has not been extensively evaluated in our study. The other limitation of our study is that it was a retrospective study. Also concordance is more in other centres across world probably due to availability of adjuvant like immunoflorescence, special stains and immunohistochemistry which was not available in our institute.

Conflict of interest

All authors declare that we have no conflict of interest to declare in presenting this research. All authors declare that no financial support was received from any organization for the submitted work

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