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Research Article

Spectrum of Non Neoplastic Skin Diseases: A Histopathology Based Clinicopathological Correlation Study

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Abstract: Skin, the largest organ of our body, is extraordinarily vibrant with regard to the diversity and complexity of the protective functions it serves. Many skin diseases can be diagnosed by a simple clinical examination, but sometimes relatively simple diagnostic procedures are required for additional valuable information towards reaching final diagnosis. A few such procedures are Skin biopsy. Potassium hydroxide preparation for fungal infections, Tzanck smear (cytological technique), examination under Wood's light. Skin biopsy is an especially useful procedure. It can be obtained in various ways like Punch biopsy, scalpel biopsy, shave biopsy and curettage biopsy. The choice of technique is according to the nature of the lesion, but a punch biopsy is the standard procedure. The correlation between the gross and histological appearances is often essential in understanding the pathogenesis and formulating the diagnosis. In the present study, over a period of 5 years 795 skin biopsies were received for different neoplastic and non neoplastic skin lesions. Out of 795 skin biopsies, 270 were clinically diagnosed as non neoplastic skin lesions. Definitive histopathological diagnosis was possible in 209 cases. In rest of the 61 cases, no histopathological diagnosis could be made as in 22 cases biopsy was inadequate to comment upon while in 39 cases no specific pattern of disease was observed which were analyzed and confirmed histologically.
Keywords: Dermatopathology, DLQI, Skin Biopsy, Dermatoses, Hematoxylin, Eosin.

INTRODUCTION

In recent years, there has been increasing awareness of the impact of skin diseases on social and leisure activities, work and sexual relationship and questionnaires such as Dermatology Life Quality Index (DLQI) have been employed to measure the impairment of quality of life [1].

There are probably at least 2000 different skin conditions that might present to the dermatologist, most dermatologists treat patients of all ages, from the neonate to the very old. The conditions seen vary enormously in severity. They range from cosmetic problems, such as dry skin or wrinkles, through a huge variety of acute or chronic disease, which may be disfiguring, itchy or painful, but are rarely fatal, to life threatening conditions, which if untreated my prove fatal within days (e.g., toxic epidermal necrolysis), weeks (e.g., pemphigus), months (e.g., malignant melanoma) or years (e.g., cutaneous lymphoma) [1].

The science and art of dermatopathology was started in early 19th century Europe with the writings of pioneers like Simon, von Baerensprung, Unna and Gans. Julius Rosenbaum (1807-1874) picked up Gilbert Breschet's suggestion of microscopic studies of skin lesion and first spoke of dermatopathologists [2]. Ttradition of dermatologists writing about histopathological aspect of skin disease was carried on by researchers like F. Pinkus, A. Civatte, J. Darier, H. Montgomery, H. Pinkus, W. Lever and more recently R.K. Winkelmann, E. Wilson Jones and A.B. Ackermann [4]. In the last century, major contributions to the discipline were made by British dermatopathologists [3, 4]. Human skin consists of a stratifgied, cellular epidermis and an underlying dermis of connective tissue [5].

Indications of Skin Biopsy [6]

- Excision of epidermal or dermal neoplasms, whether benign or malignant. Clear margins are required.
- An incisional biopsy for conformation of diagnosis of a lesion too big for removal, which will be treated by alternative methods.
- An incisional biopsy of a hard to categorise skin eruption.
- Fresh tissue incisional skin biopsies for immunopathological study.
- Simultaneous processing of contiguous incisional biopsy for pathology and for culture

of fresh, unfixed tissue when infection is suspected.

Techniques of Skin Biopsy [7, 8]

It include Excision biopsy**,** Incision biopsy**,** Punch biopsy**,** Curettage**,** Shave biopsy**,** Snip biopsy. In the present study Non neoplastic disorders of skin were studied under following groups:

- Infectious inflammatory dermatoses
- Non infectious inflammatory dermatoses
- Pigmentary disorders
- Vesiculobullous disorders
- Miscellaneous

MATERIALS AND METHOD

This study entitled "Spectrum of non neoplastic skin diseases in Bhopal and its vicinity by and their clinico-histopathological correlation" was conducted at Tertiary Health Care Centre, Bhopal over a period of 5 years. Of these 795 skin biopsies were received for different neoplastic and non neoplastic skin lesions. Out of 795 skin biopsies, 270 were clinically diagnosed as non neoplastic skin lesions, which were analyzed and confirmed histologically.

Out of these 270 biopsies, 22 samples were excluded from the study as the sample was insufficient to comment upon i.e. 248 cases constituted the study sample. Definitive histopathological diagnosis was possible in 209 cases. In rest of the 61 cases, no histopathological diagnosis could be made as in 22 cases biopsy was inadequate to comment upon while in 39 cases no specific pattern of disease was observed.

Case Selection & Exclusion Criteria

- Cases included were clinically diagnosed cases of non-neoplastic skin disorders.
- Cases with tumorous histology were excluded from the study.
- Inadequate skin biopsies were excluded from the study.

In the Histopathology division of Department of Pathology, biopsy specimens were received in 10% formal saline with adequate labelling and all the clinically relevant data mentioned in the requisition form. The specimens were then further processed in tissue processor and paraffin sections were cut and stained by the routine Hematoxylin & Eosin method.

Processing of the tissue [9]

Overnight schedule for tissue processing

- 10% Formalin: Overnight
- 70% Alcohol: 1/2 hr
- 95% alcohol: 1/2 hr
- Absolute Alcohol: 1/2 hr
- Absolute Alcohol: 1 hr
- Absolute Alcohol: 1/2 hr
- Xylene: 1 hr
- Xylene: 2 hrs
- Wax: 2 1/2 hrs
- Wax: 4 hrs

Tissue Processing

Paraffin embedding and block making, Trimming, Sectioning, Staining

Hematoxylin & Eosin Staining Procedure [9]

- Sections were dewaxed in 2 jars of Xylene, each for 2 min.
- Xylene was removed by keeping slides in 2 jars of absolute alcohol, each for 2 mins.
- Treatment with descending grades of alcohol
- In 90% alcohol for 1 min
- In 70% alcohol for 1 min
- Rinsed in water
- Sections were stained in Harris Hematoxylin for 7-10 min.
- It was followed by washing in running water till the sections turned blue.
- Sections were differentiated in 1% acid alcohol solution for 5-10 sec.
- Washed with tap water for 5 mins.
- Dipped in saturated solution of lithium carbonate till the section is completely blue.
- Washed with tap water for 5 mins.
- Treatment with increasing grades of alcohol
  - In 50% alcohol for 2 mins
  - In 70% alcohol for 2 mins
  - In 90% alcohol for 2 mins.
- Counterstain with 1% Eosin Y for 1 min.
- Rinsed in 95% alcohol 2 times each for 2 min.
- Dehydrated with absolute alcohol 3 times each for 2 mins.
- Clearing is done by 3 changes in Xylene each for 2 mins
- Mounted in DPX.

RESULTS

Table 1: Distribution of Skin Lesions

Type of skin lesion	Number	Percentage
Neoplastic	525	66.0
Non neoplastic	270	34.0

Table 2: Histopathological spectrum of non neoplastic skin disorders

Type of skin disorder	Male	Female	Total	Percentage
Infectious dermatoses	70	42	112	53.6
Non-infectious inflammatory dermatoses	19	24	43	20.6
Pigmentory disorders	14	24	38	18.2
Vesiculobullous disorders	06	02	08	03.8
Miscellaneous disorders	03	05	08	03.8
Total	112	97	209	100.00

Table 3: Histopathological spectrum of infectious inflammatory dermatoses

Type	Male	Female	Total	Percentage
Bacterial dermatoses	45	29	74	66.0
Viral dermatoses	22	13	35	31.2
Fungal dermatoses	03	00	03	02.8
Total	70	42	112	100.0

Table 4: Distribution of bacterial dermatoses

Type of Dermatoses	Male	Female	Total	Percentage
Leprosy	34	22	56	75.7
Cutaneous tuberculosis	11	07	18	24.3
Total	45	29	74	100

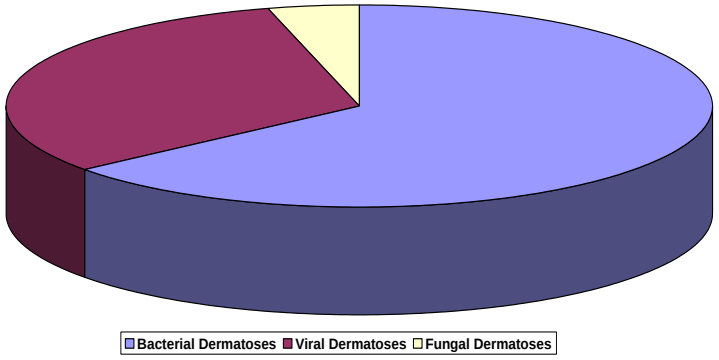

Fig. 1: Histopathological Spectrum of infectious inflammatory dermatoses

Table 5: Histopathological spectrum of non-infectious inflammatory dermatoses

Disorder	Male	Female	Total	Percentage
Sceleroderma	03	08	11	25.58
Lupus erythematosus	03	07	10	53.25
Linchen	05	03	08	16.27
Psoriasis	05	02	07	18.60
Exfoliative dermatitis	01	03	04	09.30
Pyoderma gangrenosum	01	00	01	02.33
Erythroderma nodosum	01	00	01	02.33
Granuloma annulare	00	01	01	02.34
Total	19	24	43	100.00

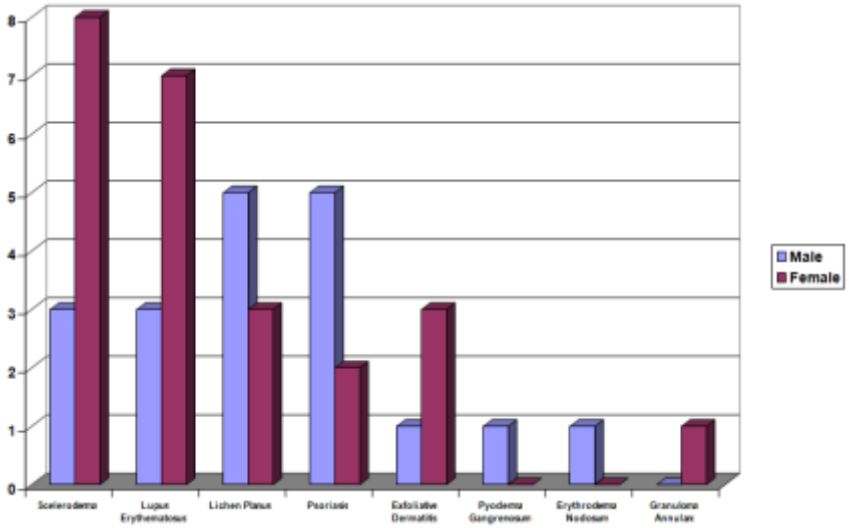

Fig. 2: Histopathological spectrum of non-infectious inflammatory dermatoses

Table 6: Histopathological Spectrum of vesiculobullous diseases

Lesion	Male	Female	Total	Percentage
Pemphigus vulgaris	02	02	04	50.0
Erythema multiforme	02	00	02	21.42
Pemphigus vegetans	01	00	01	14
Epidermolysis bullosa	01	00	01	14
Total	06	02	08	100

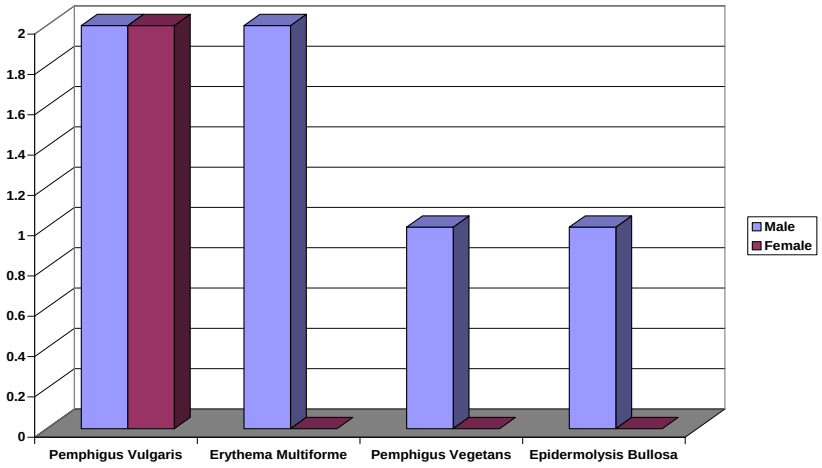

Fig. 3: Histopathological Spectrum of vesiculobullous diseases

Table 7: Histopathological Spectrum of Pigmentary disorders

Disorders	Male	Female	Total	Percentage
Intradermal nevus	10	17	27	71.05
Compound nevus	02	02	04	10.53
Vitiligo	01	03	04	10.53
Junctional nevus	01	02	03	07.89
Total	14	24	38	100

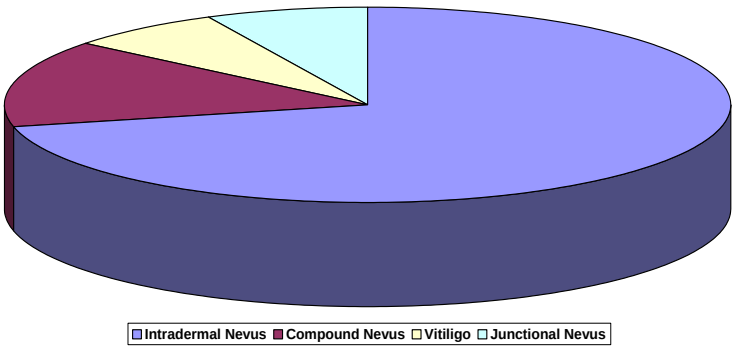

Fig. 4: Histopathological Spectrum of Pigmentary disorders

Table 8: Clinicopathological correlation

Correlation	Number	Percentage
Clinnicopathological agreement	156	63.0
Clinicopathological disagreement	53	21.4
Inconclusive	39	15.6
Total	248	100.00

DISCUSSION

A five year retrospective and prospective study of consecutive skin biopsy specimen received in the Tertiary Health Care Centre, Bhopal. As far as the contribution of histopathology to the diagnosis was concerned, histopathology confirmed the diagnosis in 63.0% cases and it gave the diagnosis which was not suspected clinically in 21.4% and was non conclusive in 15.6% cases, combining both, histopathology was helpful in making a definitive diagnosis in 84.3% cases.

D'costa F Grace *et al*. [10] conducted a similar study in pediatric age group and found positive correlation in 56.07% cases, in their study histopathology gave the diagnosis in 26.16% while they found 17.75% non conclusive cases. Hudavdelingen *et al*. [11] conducted a clinicopathological correlation study in non neoplastic skin biopsies and found correlation in 57.5% cases, in 20.5% cases histopathology offered the final diagnosis and in the rest 22% cases no diagnosis could be made.

Amongst 248 cases of non neoplastic skin disorders, 209 cases were proved histologically and could be given a definitive diagnosis. Out of these 209 cases, 112(53.6%) were infectious inflammatory dermatoses, followed by 43(20.6%) cases of non infectious inflammatory dermatoses, next in the series were 38(18.2%) cases of Pigmentory disorder, followed by 8(03.8%) cases each of vesiculobullous disorders and miscellaneous disorders.

In the present study infectious dermatoses constituted the largest group (53.6%) amongst all non neoplastic skin disorders. Amongst this bacterial dermatoses being the most common lesion constituted 66.0% of the infectious inflammatory dermatoses, Leprosy being most common 75.7% among bacterial dermatoses.

Amanjit Bal *et al*. [12] in a study on clinicopathological correlation of infectious granulomatous dermatitis found the age of patients ranged between 7-80 years with a male to female ratio of 1.5:1. Leprosy was the most common lesion (72.41%), second most common being cutaneous tuberculosis (23.1%), fungal dermatitis constituted 3.3% of the lesions of this group and post kala azar dermal leshmaniasis constituted the rest 1.16% in the same category.

Clinicopathological correlation in this category was 63% which was less as compared to 76.30% correlation found in the study of Mohammad Younas *et al*. [13]. Clinicopathological correlation was minimum in this category with maximum number of non conclusive cases.

In the present study melanocytic/ pigmentary nevus and vitiligo were the pigmentary lesions studied, forming 18.2% of non neoplastic skin disorders.

Amongst the melanocytic nevus, the most common lesion was intradermal nevus (71.05%), followed by compound nevus (10.53%) and Junctional nevus (7.89%). Out of 34 patients 24(63.16%) were female and majority patients were in the >19yr age group. The most common site of presentation in his study was head and neck.

Maximum clinicopathological correlation was found in melanocytic nevus. This result may be coincidental finding as the maximum number of patients was female in their adulthood, uncommon in infancy, naevi increase in frequency during childhood and adolescence and then more slowly to a plateau in middle age. During old age, their prevalence falls [14].

Amongst the miscellaneous, maximum number of cases were of callosity. Synonyms for it are callosity, callous, callus, clavus, corn, heloma, tyloma, keratoma. Clavus is thickening of the skin due to intermittent pressure and frictional forces. These forces result in hyperkeratosis, clinically and histologically. In the present study the most common site was foot.

D Singh *et al*. [15] described feet as the most common site of clavus formation, specifically the dorsolateral aspect of 5th toe for heloma durum, fourth interdigital web of foot for heloma molle and under metatarsal heads for calluses.

CONCLUSION

The present study was undertaken in the Tertiary Care centre, Bhopal 270 patients with clinical diagnosis of non neoplastic skin diseases were included the study. Definitive histopathological diagnosis was possible in 209 cases. In rest of the 61 cases, no histopathological diagnosis could be made as in 22 cases biopsy was inadequate to comment upon while in 39 cases no specific pattern of disease was observed.

In our study it was found that the most common non neoplastic skin disorder biopsied was inflammatory dermatoses (53.6%), followed by non infectious inflammatory dermatoses (20.6%) and pigmentary disorder (18.2%). Number of cases of vesiculobullous disorder and callosity were too less to reach a statistically significant conclusion.

Clinicopathological agreement was observed in 63% cases. While in 21.4% cases final diagnosis was different from probable clinical diagnosis. And in rest of the 15.6% cases no definitive diagnosis could be made.

Maximum clinicopathological agreement was seen in pigmentary disorders, followed by infectious inflammatory dermatoses. While the maximum number of non conclusive and inadequate biopsies was from non infectious inflammatory dermatoses, it emphasizes the importance of performing the skin biopsy at appropriate phase of the disease, from proper site, of proper thickness especially in cases of non infectious inflammatory dermatoses.

Histopathology was helpful in making the definitive diagnosis of non neoplastic skin disorders in 84.3% cases. This emphasizes the importance of histopathology in diagnosing non neoplastic skin disorders.

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