Original Article

DOI: 10.17354/ijss/2015/557

Histopathological Review of Dermatological Disorders with a Keynote to Granulomatous Lesions: A Retrospective Study

Deepti Agarwal[1], Kulwant Singh[1], Swarn Kaur Saluja[2], Parveen Rana Kundu[3], Hemlata Kamra[1], Ruchi Agarwal[3]

[1]Associate Professor, Department of Pathology, Bhagat Phool Singh GMC for Women, Khanpur Kalan, Sonepat, Haryana, India, [2]Professor and Head, Department of Pathology, Bhagat Phool Singh GMC for Women, Khanpur Kalan, Sonepat, Haryana, India, [3]Assistant Professor, Department of Pathology, Bhagat Phool Singh GMC for Women, Khanpur Kalan, Sonepat, Haryana, India

Abstract

Background: The spectrum of dermatologic disorders varies greatly according to geographical distribution, gender, age, and co-existing disorders. The objective of this study was to determine the histopathological profile of dermatological lesions, to study morphology and attempt to identify the etiology of granulomatous lesions on skin biopsies in a rural population of our set-up.

Materials and Methods: This is a retrospective study over a period of 2-year in the Department of Pathology at our rural area based tertiary care institute. The data of 180 skin biopsies received for histopathological examination were reviewed. Slides stained with routine stain and special stains like Ziehl–Neelsen stain, periodic acid-Schiff, Alcian blue, and Fite-Faraco were reviewed.

Results: Out of 180 cases, 40 (22.22%) cases of non-specific dermatitis, 35 cases (19.44%) of granulomatous lesions, followed by 21 (11.67%) cases of psoriasiform dermatitis, 7 cases of vesiculobullous and vesiculopustular diseases, and 4 (2.22%) cases were reported as connective tissue disorders. Pigmentary disorders of the skin were reported in 6 (3.33%), 23 (12.78%) cases of tumors and cysts of the epidermis and a miscellaneous category, 3 (1.67%) cases. Leprosy accounted for 23 cases of granulomatous lesions followed by 6 cases of lupus vulgaris. Positivity for acid fast bacilli was recorded in 11 cases of these cases.

Conclusion: The incidence of skin lesions was observed to occur more frequently in males and in the age group of 20-30 years. Granulomatous dermatitis is still rampant with infections predominantly leprosy and tuberculosis as the leading causes.

Key words: Bullous lesions, Granulomatous, Histopathology, Papulosquamous diseases, Vesicles

INTRODUCTION

The pattern of skin diseases varies from country to country and various regions within the same country.[1] Occasionally, skin diseases may be alone manifestation of systemic diseases.[2] Skin diseases are also influenced by various factors such as environment, economy, literacy, racial, and social customs.[2] It is more so in our country with a tropical climate, with a wide difference in socio-economic status, diverse religions, and customs in different parts of the country.[3]

Our study aimed at describing the histopathological profile of non-neoplastic dermatological disorders in a rurally based Tertiary Care Institute of Northern India. Granulomatous dermatitis frequently poses a diagnostic challenge to dermato-pathologists, as has been discussed in few studies,[4-6] since an identical histological picture is produced by several causes and conversely, a single cause may produce varied histological patterns.

Access this article online

www.ijss-sn.com

Month of Submission : 10-2015
Month of Peer Review : 11-2015
Month of Acceptance : 12-2015
Month of Publishing : 12-2015

MATERIALS AND METHODS

This retrospective study was carried out in the Department of Pathology, BPS Government Medical College for Women located in a rural area of Khanpur Kalan, Sonipat, Haryana.

Corresponding Author: Dr Deepti Agarwal, Department of Pathology, Bhagat Phool Singh GMC for Women, Khanpur Kalan, Sonepat, Haryana, India. E-mail: drdeepti75@gmail.com

All the skin biopsies received from 2012 to August 2015 were reviewed. Clinical history and relevant data were recorded from request forms of biopsies received. Slides stained with routine hemotoxin and eosin stain and special stains such as Ziehl–Neelsen (ZN) stain, periodic acid-Schiff, Alcian blue, Fite-Faraco, and Congo red for amyloid were reviewed. From the histopathology section reporting point of view, the skin is divided into four anatomical compartments or units:

1. The first compartment/unit includes the epidermis, papillary dermis, and superficial vascular plexus
2. The second compartment/unit consists of the reticular dermis and the deep vascular plexus
3. The third compartment/unit consists of the pilosebaceous units, the eccrine glands, and in certain anatomical locations, the apocrine glands
4. The fourth compartment/unit is the subcutaneous tissue (panniculum).

Ideally the skin biopsy should consist of all four compartments along with hair follicles. A 4 mm punch biopsy is preferred, and usually adequate for the histological evaluation of most inflammatory dermatoses. A superficial or shave biopsy should be avoided, because it might be misleading, producing an erroneous pattern and diagnosis.

RESULTS

A total of 180 cases were studied during the study period and classified into different age groups. The age distribution pattern revealed that the maximum biopsies received were in the age range of 21-30 years, and the least number were in the age range of 0-10 years (Table 1).

Out of these patients, 102 cases (56.67%) males and 78 cases (43.33%) females. A classification of categories of all histological diagnoses is presented in Table 2. The frequencies and percentages were "non-specific dermatitis" $n = 40$ (22.22%), followed by granulomatous lesions $n = 35$ (19.44%). 14 cases of vacuolar interface dermatitis were observed (erythema multiforme-2, phototoxic dermatitis-1, lichen sclerosus et atrophicus-1, xanthema-1, lupus erthematosus-3, and pigmented purpuric dermatitis-1). A total of 15 cases of lichenoid eruptions were seen which included 8 cases of lichen planus, 2 each of pityriasis lichenoid chronica and post-inflammatory hyperpigmentation and 1 case each of porokeratosis, ashy dermatosis, and lichen nitidus. A total of 35 (19.44%) cases with granulomas were observed (Table 3).

12 cases of malignant tumors were observed comprising of basal cell carcinoma (7 cases), squamous cell carcinoma (4 cases), and basosquamous carcinoma (1 case). Benign tumors and cyst comprise of 11 cases. These include tumors with any epithelioma component (e.g., with seborrheic keratosis $n = 5$), papilloma $n = 1$, pilomatrixoma $n = 3$, apocrine adenoma $n = 1$, and condyloma accuminata $n = 1$.

A total of 35 (19.44%) cases with granulomas were observed. The most common etiology recorded was leprosy accounting for 23 cases followed by 6 cases of lupus vulgaris. Leprosy cases were further classified into sub-groups according to Ridley and Jopling. The majority of the cases were tuberculoid leprosy (TT) followed by lepromatous leprosy. Special stain for acid-fast bacilli (AFB) was positive in 11 cases of granulomatous etiology.

Table 1: Distribution of dermatologic lesions according to age groups

Age group	Number of patients	Males	Females
0-10	13	5	8
11-20	34	23	11
21-30	38	23	15
31-40	25	14	11
41-50	27	13	14
51-60	17	11	6
>60	26	13	13
Total	180	102	78

Table 2: Detailed distribution of skin lesions on the basis of histological diagnosis

Skin lesions	*n* (%)
Non-specific dermatitis	40 (22.22)
Psoriasiform dermatitis	21 (11.67)
Interface dermatitis with lichenoid eruptions	15 (8.33)
Interface dermatitis with vacuolar interface lesions	14 (7.78)
Spongiotic dermatitis	4 (2.22)
Granulomatous lesions	35 (19.44)
Vesiculobullous lesions	7 (3.89)
Calcinosis cutis	6 (3.33)
Pigmentary disorders	6 (3.33)
Benign tumors	11 (6.11)
Malignant tumors	12 (6.67)
Disorders of connective tissue	4 (2.22)
Vasculitis	2 (1.11)
Miscellaneous lesions	3 (1.67)
Total	180 (100)

Table 3: Distribution of granulomatous skin lesions according to classification and gender

Type of lesion	Number of cases	Percentage	Males	Females
Lupus vulgaris	6	17.14	4	2
Tuberculosis	5	14.28	3	2
Verrucous type TB	1	2.85	1	-
TT leprosy	7	20	5	2
BT leprosy	4	11.42	3	1
BL leprosy	2	5.72	-	2
LL leprosy	6	17.14	4	2
Histoid leprosy	2	5.72	1	1
Indeterminate type	2	5.72	1	1
Total	35	100	22	13

TB: Tuberculosis, TT: Tuberculoid leprosy, BT: Borderline tuberculoid leprosy, BL: Borderline lepromatous leprosy, LL: Lepromatous leprosy

DISCUSSION

This study has documented the histopathological profile of skin lesions at our tertiary care center with a fairly high presence of non-specific dermatoses (22.22%) and granulomatous lesions (19.44%). The sex distribution pattern revealed that most of the patients were males (56.67%). The age distribution pattern revealed that the maximum biopsies received were in the age range of 21-30 years (Table 1) with most of the patients falling below the age of 40 years. The youngest patient was 5 years old, and oldest was 74 years old.

An analysis of the broad categories revealed that the most frequently encountered lesions were non-specific dermatoses (22.22%) and granulomatous lesions (19.44%) (Table 2). Inflammatory lesions are grouped initially into general categories and then specific features are sought to narrow the diagnoses. Combining the available information on the gross appearance and the clinical differential diagnosis with the histological diagnosis is the vitally important prior to rendering a final diagnosis.[7] Dermatitis reactions may have acute, subacute, and chronic inflammatory phases with fairly specific histological correlates, incited by external or internal antigens. Since the pathogenesis of most inflammatory dermatitidis is unknown, they are best classified using morphologic criteria.[8]

Psoriasiform dermatitis, observed in 21 (11.67%) cases, revealed a characteristic pattern of epidermal hyperplasia typified by elongation of the epidermal rete ridges. Interface dermatitis with lichenoid eruption was observed in 15 (8.33%) cases in our study. It refers to a morphologic alteration at the junction of epidermis and dermis with vacuolization within basilar keratinocytes or basement membrane.[9] These cases had an inflammatory cell-rich dense band-like infiltrate filling the papillary dermis. Interface dermatitidis with vacuolar interface lesions had a poor density or patchy presence of inflammatory cell infiltrate in the papillary dermis and was observed in 14 (7.78% cases). Spongiotic dermatitis, also referred to as eczematous dermatitis, was observed in 4 cases (2.22%) in our study. It refers to the presence of spongiosis or intercellular edema that stretches apart keratinocytes along with the occasional formation of intra epidermal vesicles.[6,8] Spongiosis was variable, multifocal, and accompanied by intracellular edema and exocytosis of inflammatory cells.

Infectious granulomatous lesions were observed in 19.44% cases in the present study which in accordance with the study done by Mohan *et al*.[6] The most common etiology of granuloma in our study was leprosy, accounting for 23 cases (12.77% of total). Leprosy presents clinically as macular, infiltrative nodular and diffuse type, affecting both the skin and peripheral nerves.[10] Histologically, it exhibited an extensive cellular infiltrate separated from the flattened epidermis by a narrow Grenz zone of normal collagen. In most of the cases, this infiltrate caused the destruction of the cutaneous appendages extending into the subcutaneous fat.[11] The Fite-Faraco stain showed globi of lepra bacilli within the foamy macrophages (Figure 1).

Erythema nodosum leprosum, a Type-2 lepra reaction, is an acute inflammatory reaction seen in a patient with borderline TT and occasionally in lepromatous subtypes.[10] Here, the foci of acute inflammation superimposed on chronic leprosy were observed (Figure 2).

TT was the most common lesion encountered. In our study, most of the patients with granulomatous lesions were in the 21-40 years age group. The underlying dermis showed epithelioid cell granulomas in the underlying dermis (Figure 3). Neural invasion is also frequently observed in stained sections.

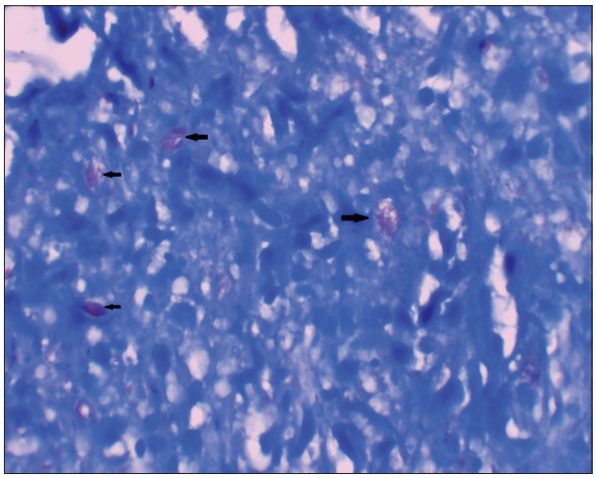

Figure 1: Fite-Faraco staining with globi of lepra bacilli within the foamy macrophages (arrows), (×100)

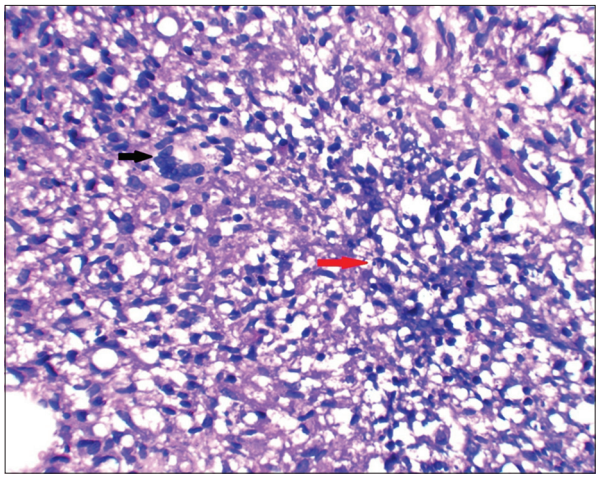

Figure 2: Giant cells (black arrow) along with abundant polymorphonuclear cells (red arrow), (×20)

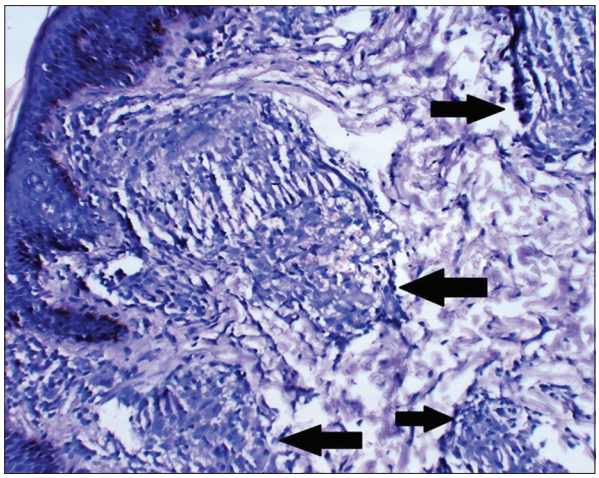

Figure 3: H and E stain (×20): Section showing numerous granulomas in the dermis (arrows)

Studies done in Pakistan[5] reveal out of a total of 97 cases of tuberculosis (TB) 17 (17.5%) were children (age <16 years) while Kumar and Muralidhar[12] observed 75 children (18.7%) out of 402 cases of cutaneous TB. Cutaneous TB is a relatively rare clinical entity in western countries but is still prevalent in the developing world as in far East, where it accounts for 0.4% of patients with skin disease.[13] In developing countries like India, the incidence has fallen from 2% to 0.15%. In our study, 6 out of 12 cases of TB were typified which included lupus vulgaris and TB cutis (5 cases). Cutaneous TB is an infection of the skin, and subcutis caused by *Mycobacterium* TB occurs by three routes, i.e., direct inoculation, hematogenous spread, and direct extension from underlying tuberculous lymph node (causing scrofuloderma). Scrofuloderma is the most common form of cutaneous TB in children. It results as a direct extension from an underlying TB focus, such as a regional lymph node or infected bone or joint, to the overlying skin.[12,14,15] Here, tissue sections revealed tuberculoid granuloma surrounding areas of necrosis.

In a study done by Uz Zafar *et al*.,[5] out of 47 typified cases of cutaneous TB, lupus vulgaris was the most common form, seen in 18 (38.29%) of these patients, followed by other types. Similar results were also seen by Singh[10] and Kumar *et al*.[15] who found lupus vulgaris the most common form in 44% and 48%, respectively. On the contrary, we observed an incidence of lupus vulgaris in 6 cases (17.1% among granulomatous lesions). In the present study, special stain for AFB was positive in 11.5% of all cases. According to Veena *et al*.,[11] AFB were found in 2 (6.45%) out of 31 skin biopsies in leprosy patients.

CONCLUSION

Our study showed that the incidence of skin lesions was more frequent in males and in the age group of 20-30 years. Moreover, cases where skin biopsy delivered a non-specific diagnosis, it aided in ruling out infective or malignant etiology. Granulomatous dermatitis is still rampant with infections predominantly leprosy and TB as the leading causes. Demonstration of AFB by ZN stain is specific; however, they are not detected with ease, thereby further emphasizing the significance of adequate clinical data and work up which helps in the elucidation of specific etiology.

REFERENCES

1. Patil R, Makdani M, Gunjalia A, Gandhi K, Patel H. Retrospective study of papulonodular skin lesions and their clinopathological correlation. Int J Med Sci Public Health 2015;4:612-6.
2. Gulia SP, Wadhai SA, Lavanya M, Menon R, Chaudhary M, Kumar SP. Histopathological pattern of skin diseases in a teaching hospital Puducherry. Int J Recent Trend Sci Technol 2014;11:45-50.
3. Mehar R, Jain R, Kulkarni CV, Narang S, Mittal M, Patidar H. Histopathological study of dermatological lesions: A retrospective approach. Int J Med Sci Public Health 2014;3:1082-5.
4. Bal A, Mohan H, Dhami GP. Infectious granulomatous dermatitis: A clinicopathological study. Indian J Dermatol 2006;51:217-20.
5. Uz Zafar MN, Sadiq S, Arif Memon M. Morphological study of different granulomatous lesions of the skin. J Pak Assoc Dermatol 2008;18:21-8.
6. Mohan H, Bal A, Dhami GP. Non-infectious granulomatous dermatitis: A clinicopathological study. J Cutan Pathol 2006;33:767-71.
7. Hegde VK, Khadilkar UN. A clinicopathological study of interface dermatitis. Indian J Pathol Microbiol 2014;57:386-9.
8. Singh R, Bharathi K, Bhat R, Udayashanka C. The histopathological profile of non-neoplastic dermatological disorders with special reference to granulomatous lesions - Study at a tertiary care Centre in Pondicherry. Internet J Pathol 2012;13.
9. Sabir F, Aziz M, Afroz N, Amin SS. Clinical and cyto-histopathological evaluation of skin lesions with special reference to bullous lesions. Indian J Pathol Microbiol 2010;53:41-6.
10. Singh G. Lupus vulgaris in India. Indian J Dermatol Venereol 1974;40:257-60.
11. Veena S, Kumar P, Shashikala P, Gurubasavaraj H, Chandrasekhar HR, Murugesh. Significance of histopathology in leprosy patients with 1-5 skin lesions with relevance to therapy. J Lab Physicians 2011;3:21-4.
12. Kumar B, Muralidhar S. Cutaneous tuberculosis: A twenty-year prospective study. Int J Tuberc Lung Dis 1999;3:494-500.
13. Chintu C, Mwinga A. An African perspective on the threat of tuberculosis and HIV/AIDS – Can despair be turned to hope? Lancet 1999;353:997.
14. Khan Y, Anwar J, Iqbal P, Kumar A. Cutaneous tuberculosis: A studies of ten cases. J Pak Assoc Dermatol 2001;11:6-10.
15. Kumar B, Rai R, Kaur I, Sahoo B, Muralidhar S, Radotra BD. Childhood cutaneous tuberculosis: A study over 25 years from northern India. Int J Dermatol 2001;40:26-32.

How to cite this article: Agarwal D, Singh K, Saluja SK, Kundu PR, Kamra H, Agarwal R. Histopathological Review of Dermatological Disorders with a Keynote to Granulomatous Lesions: A Retrospective Study. Int J Sci Stud 2015;3(9):66-69.

Source of Support: Nil, **Conflict of Interest:** None declared.