

Original research article

An inquiry into the histopathological patterns of various granulomatous lesions of the skin

Dr. Rajiv Kumar

Associate Professor, Department of Pathology, Lord Buddha Koshi Medical College and Hospital, Saharsa, Bihar, India.

Corresponding Author: Dr. Rajiv Kumar

Abstract

Aim: To evaluate the histopathological patterns of different cutaneous granulomatous lesions.

Materials and Methods: The present cross-sectional observational study was conducted in the Department of Pathology, Lord Buddha Koshi Medical College and Hospital, Saharsa, Bihar, India. For 1 year. This cross sectional study enrolled 120 cases of skin biopsies after histopathological confirmation of granulomatous lesions.

Results: Among 120 cases were studied in which male predominance was noted with 73(60.84%) cases and females constituted 47 (39.16%) case providing M: F ratio of 1.5:1. Most of the patients were noted in age group of 20 to 30 years i.e. 45(37.5%) cases followed by 23 (19.17%) case in 30 to 40 years. 85% of cases were seen below 50 years of age in our study. Infectious granulomatous dermatoses were very common, only 2 cases of sarcoidosis were found.

Conclusion: Tuberculosis, fungal infection, and foreign body reaction were the most frequent causes of cutaneous granuloma. The two popular subtypes of leprosy is borderline tuberculoid leprosy and tuberculoid leprosy.

Keywords: cutaneous lesions, leprosy, tuberculosis

Introduction

Granulomas are clusters of activated histiocytes and multinucleate giant cells that may or may not have a cuff of surrounding lymphocytes or exhibit necrosis. Granulomas in the skin may have a variety of aetiologies and, as a result, clinic-pathological presentations. Infections such as measles, leprosy, and fungal infections are among the causes, as are foreign bodies, sarcoidosis, necrobiosis, and drug reactions. As a consequence, an etiological description is insufficient.

The granulomatous inflammatory disorders are distinct type of chronic inflammatory processes where there is distinctive presence of granulomas. Granulomas are formed by accumulation of epithelioid type histiocyte, inflammatory cells and multinucleated giant cells.¹ Firstly granulomatous term was used by Virchow to describe a granule like tumor mass of granulation tissue.² Granulomatous inflammation is classified as type IV hypersensitivity reaction and can be induced by various kinds of infections, autoimmune, toxic, allergic and neoplastic conditions. Different types are granulomatous inflammatory lesion of skin are seen in different geographic locations.^{3,4} A single etiology can produce varied histological features and conversely many granulomatous skin lesion with almost similar histological features can have different etiologies.⁵ So cutaneous granulomatous lesion often present as a diagnostic challenge to pathologists and dermatologists. Granulomatous dermatoses due to infectious causes are very common and leprosy and tuberculosis are the leading etiologies.⁶ Histopathology with routine and special stains play important role in identifying the specific infectious agent 1 and in classification of Hansen

disease.^{7,8} This study was conducted with the aim to evaluate the frequency and patterns of different cutaneous granulomatous lesions.

Material and Methods

The present cross-sectional Observational was conducted in the Department of Pathology, Lord Buddha Koshi Medical College and Hospital, Saharsa, Bihar, India. for 1 year. after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

The research included 120 cutaneous lesion biopsies with granuloma formation. Medical observations and other important details is collected from the biopsies requisition types. Wherever possible, cutaneous biopsies were processed and stained with H&E and special histochemical stains such as Ziehl Neelsen (ZN), Fite Faraco (FF), Periodic Acid Schiff (PAS), and Gomori Methenamine Silver (GMS). The research included skin lesions of granuloma formation histopathologically. Cases with no granuloma formation or insufficient biopsies are ruled out. The histopathological and clinical findings of cutaneous granulomatous lesion cases were examined.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages and means.

Results

Table 1: Gender base distribution

Gender	N=120	Percentage
Male	69	57.5
Female	51	42.5

Table 2: Distribution according to age group

Age distribution	Number of cases	Percentage
Below 10	3	2.5
10-20	13	10.83
20 -30	45	37.5
30-40	23	19.17
40-50	18	15
50-60	9	7.5
60-70	6	5
Above 70	3	2.5

Table 3: Distribution according to etiology of granulomatous skin lesion

Disease	Number of cases	Percentage
Indeterminate	26	21.67
Tuberculoid Leprosy	21	17.5
Borderline Tuberculoid	30	25
Borderline Lepromatous	10	8.33
Lepromatous Leprosy	26	21.67
Fungal granuloma	3	2.5

Lupus Vulgaris	2	1.67
Sarcoidosis	2	1.67

Discussion

Cutaneous granulomas are commonly encountered in skin clinics and pose considerable amount of diagnostic dilemma to the dermatologist. Skin biopsy helps confirm a granulomatous reaction and further may point towards a diagnosis in many cases. However, histology alone may also not be sufficient in many cases and other adjunctive tests may be essential to come to a final diagnosis. Granuloma formation is due to type IV hypersensitivity reaction elicited by infectious and non infectious antigen. Granulomatous dermatoses are common in North India with overlapping clinical presentations. So, it becomes important to catch the definitive etiological diagnosis for their treatment.⁹

Histopathology plays a pivotal role for confirmatory diagnosis like in several diseases of other system of the body.⁶ The distribution of granulomatous dematoses varies widely according to geographic location. Very less number of studies done on the infectious granulomatous dermatoses, showing broad statistical variation for several lesions. This study is comparable to Gautam et al.⁷ Pawale et al.¹⁰ and Dhar et al.¹¹ in finding of predominance of male in granulomatous skin lesion showing male(60.84%), female (39.16%) with M:F ratio of 1.5:1. Infectious granulomatous dermatoses were commonest in this study which is similar with the study by Bal et al.^{12,13} Commonest site of the skin lesions was upper extremity which is comparable with the study done by Gautam et al.⁷ but not with Zafar et al.¹⁴ in which most lesion were found in head and neck region. Present study shows Tuberculoid Leprosy as the commonest etiological diagnosis 21(17.5%) cases. Mh El Khalwary et al.⁹ concluded 40.8% cases showing cutaneous tuberculosis followed by 31.7% case of leprosy. Rubina Qureshi et al.¹³ concluded cutaneous leishmaniasis 56.7% as the leading cause of granulomatous dermatoses followed by 13.5% case of lupus vulgaris. Bal et al.¹² and Potekar et al.¹⁵ concluded leprosy as a leading cause of cutaneous granulomatous disease. The observations in this study is similar with the findings of studies by Bal et al.¹² and Potekar et al.¹⁵ done in India. In our study the commonest subtype of leprosy was found to be borderline tuberculoid 30(25%) cases which is comparable with the findings of Gautam et al.⁷ 46.7% cases, Bal et al.¹² 55.2% cases and Chakrabarti et al.¹⁶ 57.94% cases. On Morphology non-caseating granulomas were found in all the tuberculoid as well as in borderline tuberculoid leprosy which were same as granulomas in tuberculosis and sarcoidosis. Strong positivity noted in all cases for lepromatous leprosy on Fite Faraco stain. Borderline tuberculoid leprosy shows positivity in 3 cases for Fite Faraco stain but none in tuberculoid leprosy. Granulomatous infiltration of nerve bundle, arrector pili muscle and adnexa along with proper clinical findings were helpful in the diagnosis of tuberculoid and borderline tuberculoid leprosy. Cutaneous tuberculosis was the second commonest granulomatous dermatoses in this study, 2(1.67%) cases were diagnosed as lupus vulgaris were found to be negative on Ziehl Neelsen stain. Bal et al.¹² found 5% positivity Z-N staining in cases of Lupus vulgaris. Z-N staining is specific for acid fast bacilli, still its positivity is low and varies with different studies. The present study did not revealed any case of cutaneous leishmaniasis. Rubina et al.¹³ found 56.7% cases in Pakistan. In this study 2 cases was reported as cutaneous sarcoidosis based on epithelioid cell granuloma without caseation and presence of inflammatory cells or Langhans giant cells. In this study there was 2 (1.67%) case of sarcoidosis somewhat similar to reported by Gautam et al.⁷ 1.88%. In the present study 3(2.5%) cases of fungal granuloma was noted similar to Potekar et al.¹⁵ Different studies reported fungal cutaneous granuloma in span of 2.7% to 3.3%.^{6,7,13,16-18}

Conclusion

Granulomatous dermatoses have a wide range of etiologies depending on where they occur. Infectious granulomatous dermatoses are common causes, with leprosy being the most common. Clinically, granulomatous skin lesions present in a variety of ways. Along with the correct history and relevant clinical review, histopathology plays a pivotal role in the diagnosis and sub-classification of cutaneous granulomatous lesions. Special stains play an important part in the process. Our research recognises the most prevalent chronic granulomatous inflammatory dermatoses in this part of India, which will help in management and implicate health initiatives.

Reference

1. The granulomatous reaction pattern. In: Weedon D, editor. *Skin Pathology* ; 2002,. p. 193–220. 2nd ed.
2. Wc J. Concepts of granulomatous inflammation. *Int J Dermatol*. 1984;23:90–99.
3. Permi H, Shetty JK, Shetty KP, Teerthanath S, Mathias M, et al. Chandrika A Histopathological Study of Granulomatous Inflammation. *Nitte Univ J Health Sci*. 2012;2(1):15–19.
4. Zaim MT, Bordell RT, Pokorney. Non Neoplastic Inflammatory Dermatoses: A Clinicopathologic Correlative Approach. *Mod Pathol*. 1990;3:381–414.
5. Singh R, Bharathi K, Bhat R, Udayashankar 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(3):14240.
6. Amanjit B, Harsh M, Dhami GP. Infectious Granulomatous Dermatitis. *Indian J Dermatol*. 2006;51(3):217–220.
7. Gautam K, Pai RR, Bhat S. Granulomatous Lesions of Skin. *J Pathol Nepal*. 2011;1(2):81–86
8. Lockwood DN, Nicholas P, Smith WC, Das L, Barkataki P, et al. Comparing The Clinical And Histological Diagnosis of Leprosy and Leprosy Reactions In Infir Cohort of Indian Patients with Multibacillary Leprosy. *Plos Neglected Trop Dis*;6(6):1702–1702.
9. Mohammed EK, Ibrahim M, Bayoumi E, Hussein HEN. Clinicopathological Features & The Practice of Diagnosing Infectious Cutaneous Granulomas In Egypt. *Int J Infect Dis*. 2011;15:620–626.
10. Pawale J, Belagatti SL, Naidu V, Kulkarni MH, Puranik R. Histopathological study of cutaneous granuloma. *Ind J Public Health Res Develop*. 2011;2(2):74–79.
11. Dhar S, Dhar S. Histopathological features of granulomatous skin diseases: an analysis of 22 skin biopsies. *Indian J Dermatol*. 2002;47(2):88–90.
12. Bal A, Mohan H, Dhami GP. Infectious granulomatous dermatitis: a clinic-pathological study. *Indian J Dermatol*. 2002;47(2):88–90.
13. Rubina Q, Riyaz AS, Anwar HU. Chronic Granulomatous Inflammatory Disorders of Skin at A Tertiary Care Hospital in Islamabad. *Int J Pathol*. 2004;2(1):31–34.
14. Zafar M, Sadiq S, Menon MA. Morphological study of different granulomatous lesions of the skin. *J Pak Asso Dermatol*. 2008;18(1):21–28.
15. Ratnakar M, Potekar AP, Javalgi LD, Rodrigues R, Dwarampudi S. Histopathological Study of Infectious Granulomatous Skin Lesions. *Ann Pathol Lab Med*. 2018;5(7).
16. Stephenson TJ. *Inflammation: General & Systemic Pathology*. 2009;p. 216–235. 5th Edition.
17. Sebastian L, Klaus S, Eckart H. *Bacterial Diseases, Protozoan Diseases & Parasitic Infestations in Levers Histopathology Of Skin 10th Edition*. Lippincott Willimas & Wilkins. 2009;p. 550–572.

18. Nayak SV, Shivrudrappa AS, Mukamil AS. Role of fluorescent microscopy in detecting Mycobacterium leprae in tissue sections. *Annals of diagnostic pathology*. 2003;7(2):78–81.

Received: 07-08-2020 || Revised: 06-09-2020 || Accepted: 22-10-2020