

Hospital Based Assessment of the Morphology and Etiology of Granulomatous Lesions on Histopathologically Evaluated Biopsies of the Skin and Subcutaneous Tissue

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Abstract

Background: Granulomatous dermatoses are common skin pathology, often need histopathological confirmation for diagnosis. Histologically six sub-types of granulomas found in granulomatous skin diseases- tuberculoid, sarcoidal, necrobiotic, suppurative, foreign body & histoid type.

Objective: The aim was to study the morphology and find the etiology of all the granulomatous lesions on histopathologically evaluated biopsies of the skin and subcutaneous tissue.

Materials and methods: A prospective study was done in Patna Medical College & Hospital, Patna, Bihar, India from August 2019 to August 2020. The biopsies of the cases diagnosed as granuloma on H & E-stained sections were selected. Special stains like Ziehl-Neelsen stain, Gomori's Methenamine silver were done wherever required.

Results: Total of 78 granulomatous lesions were studied. Granulomas with different morphology and etiology were seen. Out of a total 78 cases, 39 cases (50.0%) showed tuberculoid granulomas, 12 cases (15.3%) showed histiocytic granulomas, 15 cases (19.2%) showed foreign body granuloma, 8 (10.2%) showed suppurative, 4 (5.1%) showed necrobiotic granuloma.

Conclusion: Granulomatous lesion of skin was most common lesion in males. Commonest type of granuloma was tuberculoid and the most common etiological subtype was borderline tuberculoid leprosy.

Keywords: Granulomas, leprosy, fungal.

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Introduction

Granulomatous skin lesions are distinctive pattern of chronic inflammatory response of skin due to reaction against various organic and inorganic antigens [1,2]. Granulomas are characterized by focal

collection of epithelioid cells or histiocytes, admixed with variable number of leucocytes (especially mononuclear cells) and multinucleated giant cells. Granulomatous reaction is a type IV hypersensitivity reaction evoked by poorly

soluble reactive substances. Six types of granulomatous skin lesions are identified according to cellular constituents and associated changes: 1) tuberculoid, 2) sarcoidal, 3) necrobiotic, 4) suppurative 5) foreign body and 6) histoid type granuloma [3,4]

Fully developed granulomas with sheets of epithelioid histiocytes and giant cells are easily recognized, but more subtle lesions containing a few epithelioid histiocytes still qualify as granulomatous.[5]

Incidence and prevalence of different types of granulomatous dermatitis depend on geographic location. Granulomatous skin lesions are common in eastern India. Many granulomatous skin lesions have identical histomorphology and conversely a single pathology can produce varied histological features.[6]

The provocative agents of granulomatous inflammation appear to be non-degradable, by both neutrophils and non- active macrophages. The actions of polymorphonuclear leucocytes, non-activated macrophages and chemical mediators associated with tissue injury are insufficient to completely digest and eradicate the offending agent. Required for such degradation are the action of transformed macrophages formed with the help of CD4+T cells. CD4+T cells secrete various mediators such as IL2, IFa, TNF and lymphotoxin for the transformation of macrophage into epithelioid cells and giant cells, which are the component of granuloma. [7]

Materials and methods:

This study was undertaken in Department of Pathology, Patna Medical College & Hospital, Patna, Bihar, India from August 2019 to August 2020.

Methodology

The biopsies of the cases diagnosed as granuloma on Haemotoxyline and eosin-stained sections were selected. Special stains like ZN, GMS, PAS, Fite Faraco stain were used when required. The relevant clinical findings and lab investigation details were collected by personal interview and examination of the patient, or from hospital case sheets.

Results:

Total cases showing granulomatous inflammation during study period were 78 cases. Out of 78 cases, 40 cases were male, and 38 cases were females. Ages of all the patients ranged from 2 to 65 years. Out of a total 78 cases, 39 cases (50.0%) showed tuberculoid granulomas, 12 cases (15.3%) showed histiocytic granulomas, 15 cases (19.2%) showed foreign body granuloma, 8 (10.2%) showed suppurative, 4 (5.1%) showed necrobiotic granuloma. Commonest etiology of granuloma was leprosy with 37 cases followed by foreign body granuloma, granulomas of fungal etiology, and granulomas of tuberculous etiology, actinomycosis and the granulomas of unknown etiology. Morphology of lesion and use of special stain helped us to diagnose with specific etiology for 76 out of 78 cases. Actinomycosis were confirmed by grams stain and other fungal lesions were confirmed by GMS stain.

Table 1: Age and sex distribution of the patients

Age Groups (years)	Male	Female	Total (%)
0-10	2	14	16
11-20	13	7	20
21-30	8	6	14
31-40	5	5	10
41-50	3	3	6

51-60	3	2	5
61-70	6	1	7
Total	40	38	78

Table 2: Morphological type of granuloma

Type of Granuloma	Number	%
Tuberculoid	39	50.0
Histiocytic	12	15.3
Foreign body	15	19.2
sarcoidal	-	-
suppurative	08	10.2
necrobiotic	04	5.1

Table 3: Etiological types of granuloma

Etiology	Disease	No. of cases	Total/percentage
M. Tuberculosis	Lupus vulgaris	06	7(7.6%)
M. Leprae	TT	07	37(%)
	BT	15	
	BL	03	
	LL	04	
	IL	08	
	Histioid leprosy	02	
Actinomyces Israeli	Actinomycosis	5	5(6.4%)
Fungal			9(11.5%)
a) H. capsulatum	Histoplasmosis	01	
b) M. mycetomatis	Madura mycosis	05	
c) P. boydii	Pseudallescheria boydii	03	
Foreign body			17(21.7%)
a) Lipid	Xanthoma	11	
b) Keratin	Epidermal cyst with granuloma	03	
c) Keratin	SCC with granuloma	02	
Unknown etiology	Granuloma annulare	02	03(3.8%)
Total		78	78(100%)

Discussion:

Granulomatous inflammation is a type-IV hypersensitivity reaction to an antigen. Various infectious and non-infectious granulomatous dermatoses are frequent among the population of eastern part of India. [8]

Granulomatous inflammation was recognized as a distinct entity in the early nineteenth century and has been of

continuing interest since then. Granulomatous inflammation forms a common and intriguing problem. Arrival at a proper diagnosis is mandatory so that appropriate treatment can be delivered to the patient. Histopathology remains a time-tested tool for establishing a correct diagnosis, like in many other diseases pertaining to various organ systems of the body [9]

Out of a total 78 cases, 39 cases (50.0%) showed tuberculoid granulomas, 12 cases (15.3%) showed histiocytic granulomas, 15 cases (19.2%) showed foreign body granuloma, 8 (10.2%) showed suppurative, 4 (5.1%) showed necrobiotic granuloma. Definitive etiological diagnosis is important for their management. Histopathology is a gold standard tool for correct diagnosis of various granulomatous skin lesions.

Microscopically, wide spectrum of histopathological features of different granulomatous lesions was observed in the present study. We classified the lesions based on histo-morphology and etiology of the granulomatous diseases. [8]

Out of total 78 cases, 40 cases were males, and 38 cases were female. It showed that males are more susceptible to develop granulomatous lesions of skin. This finding was not in accordance with study done by Zafar M. [8]

Majority of cases xanthoma showed aggregates of foamy histiocytes and Touton type of giant cells with interspersed bands of collagen in the lower dermis. Cholesterol clefts were seen in one case. Similar observation was seen by Bulkley BH et al in his case study of 17-year-old girl presenting as a nodule over the knee. [9]

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