ORIGINAL ARTICLE

DISTRIBUTION OF HISTOPATHOLOGICAL VARIANTS OF CUTANEOUS GRANULOMATOUS INFLAMMATION

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ABSTRACT

Background: A granuloma is defined as a circumscribed collection of modified macrophages with scattered giant cells and lymphocytes. It represents a cell mediated (type IV) hypersensitivity reaction. The objective of this study was to determine the pattern of different cutaneous granulomas.

Material & Methods: This cross-sectional study was conducted in Pathology Department, Bannu Medical College, Bannu, KPK, Pakistan. The biopsies were collected from different hospitals of the area with relevant clinical information and supportive laboratory tests. Eighty six biopsies of cutaneous granulomatous inflammation from various anatomical locations were analyzed. Demographic variables were sex, age in years and age groups including 10-20, 21-30, 31-40, 41-50, 51-60 and 61-70 years. Research variables were; types of cutaneous granuloma with attributes of tuberculous granuloma, cutaneous leishmaniasis, fungal granuloma, foreign body granuloma, leprosy, sarcoid granuloma, malakoplakia and necrobiotic granuloma. Inclusion criteria was all biopsies of cutaneous granulomatous inflammation of any age, sex and location in body. Exclusion criteria was insufficient biopsy material, autolysed specimen and granulomas from sites other than of cutaneous location. Numeric variables were calculated with mean and SD whereas categorical as frequency and percentages. SPSS version 20 was used for analysis.

Results: Out of a total of 86 cases of cutaneous granulomatous tissue biopsies, male to female ratio was 1.2:1. The age range was from 10- 70 years with mean age 34.47±13.55 years, The commonest age group was 21-30 years with 39 cases (45.38%) followed by 31-40 years with 28 (32-55%) cases. The most common type of granuloma was tuberculous granulomas 63 (73.28%) followed by granuloma of cutaneous leishmaniasis 08 (9.30%), fungal granulomas 05 (5.81%), foreign body granulomas 04 (4.65%), leprosy 03 (3.84%) and one each (1.16%) of necrobiotic granuloma, sarcoid granuloma and malakoplakia.

Conclusion: The tuberculous granulomas are the commonest granulomas in district Bannu, Pakistan, specially in 21-40 years of age.

KEY WORDS: Tuberculous Granulomas; Foreign Body Granuloma; Sarcoid Granuloma; Histopathology.

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INTRODUCTION

The hallmark of chronic granulomatous inflammation is granuloma. Granuloma is defined as a circumscribed collection of modified macrophages with scattered giant cells rimmed by lymphocytes and a collar of fibrous tissues.[1] The basic pathophysiology of granulomatous inflammation is non degradable nature of the injurious agent engulfed by macrophages. For such degradation an action of transformed/modified macrophages is required which are formed in response to type IV (cell mediated immunity).[2] The formation of a granuloma effectively "walls off" the offending agent and is therefore a useful defense mechanism but is not always successful in eradication of the causative agent.[1,3]

There are different causes of granulomatous inflammation, these may be infectious or non infectious. The infectious causes are Mycobacterium tuberculosis causing tuberculous granulomas both caseating and non caseating, Mycobacterium leprae causing non caseating lepromatous granulomas

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both tuberculoid and lepromatous as well as borderline type, Treponema Pallidum causing Gumma in syphilis a microscopic to grossly visible granulomatous lesion composed of sheets of histiocytes, plasma cell and vasculitis. Gram negative bacilli Bartonella Henselae causing suppurative granuloma of cat scratch disease which is composed of rounded or stellate granulomas containing central neutrophilic collections.[4,5]

Histologically granulomas are identified into six or seven types on the basis of cells and tissues architectural pattern formation. These are Tuberculous granulomas, Lepromatous granulomas, Foreign Body granulomas, Necrobiotic granulomas, Suppurative granulomas, Sarcoidal granulomas and Xanthgranulomas/ malakoplakia. [6-8]

The non infectious granulomas are non caseating nacked sarcoid granulomas of unknown etiology with numerous activated macrophages, few lymphocytes and scattered asteroid body or conchoids body.

Crhon's disease may have an association with non caseating granulomas in the wall of the intestine in 40-60% of patients.[9]

Foreign body granuloma is another type of non caseating granulomas caused by foreign body agent with typical foreign body type giant cells, histiocytes and other inflammatory cells.[10]

Necrobiotic granulomas is an another granuloma of unknown etiology in young diabetic people with central fibrinoid necrosis.[11]

The frequency and type of different granulomas vary according to the geographical locations. There is less data available regarding the frequency of cutaneous granulomas in Pakistan although it is a common type of chronic inflammation in the form of tuberculous granulomas.[12] The objective of this study was to determine the pattern of different cutaneous granulomas.

MATERIAL AND METHODS

This cross-sectional study was conducted in Pathology Department, Bannu Medical College, Bannu, KPK, Pakistan. The biopsies were collected from different hospitals of the area with relevant clinical information and supportive laboratory tests. Eighty six biopsies of cutaneous granulomatous inflammation from various anatomical locations were analyzed. Demographic variables were sex, age in years and age groups including 10-20, 21-30, 31-40, 41-50, 51-60 and 61-70 years. Research variables were; types of cutaneous granuloma with attributes of tuberculous granuloma, cutaneous leishmaniasis, fungal granuloma, foreign body granuloma, leprosy, sarcoid granuloma, malakoplakia and necrobiotic granuloma. Inclusion criteria was all biopsies of cutaneous granulomatous inflammation of any age, sex and location in body. Exclusion criteria was insufficient biopsy material, autolysed specimen and granulomas from sites other than of cutaneous location. All the biopsy specimens were received in 10% buffered formalin, registered with proper biopsy number and further processed for 1-5 tissues sections 5 mm thick. These sections placed in tissue capsule and processed in different grades of alcohol, xylene, paraffin wax, blocks prepared, microtome sections five micron thick were taken, slide prepared, dried in incubator and then processed for hematoxylin and eosin staining. Lastly slides were mounted with DPX and cover slip placed, labeled and made ready for histopathologist reading. The diagnostic criteria for tuberculous granulomas was granulomatous inflammation both caseating and non caseating confirmed by AFB positive ziehl neelsen staining of tissue, culture of fresh biopsy material in lowenstein Jensen media etc. For fungal granulomas periodic acid-Schiff (PAS) stain was used for confirmation. For malakoplakia containing foamy macrophages with basophilic inclusions called Michaelis Gutmann bodies were identified by PAS stain. For leprosy clinical evaluation as well as characteristics features of granuloma with additional support from Fite's stain was also added. Numeric variables were calculated with mean and SD whereas categorical as frequency and percentages. SPSS version 20 was used for analysis.

RESULTS

Out of a total of 86 cases of cutaneous granulomatous tissue biopsies, male to female ratio was 1.2:1. The age range was from 10- 70 years with mean age 34.47±13.55 years, The commonest age group was 21-30 years with 39 cases (45.38%) followed by 31-40 years with 28 (32-55%) cases as given in table 1.

Table 1: Age distribution of various cutaneous granulomatous inflammation (n=86).

Age group in years	Number of cases	Percentage
10-20	06	6.97%
21-30	39	45.38%
31-40	28	32.55%
41-50	06	6.97%
51-60	05	5.81%
61-70	02	2.32%

The most common type of granuloma was tuberculous granulomas 63 (73.28%) followed by granuloma of cutaneous leishmaniasis 08 (9.30%), fungal granulomas 05 (5.81%), foreign body granulomas 04 (4.65%), leprosy 03 (3.84%) and one each (1.16%) of necrobiotic granuloma, sarcoid

granuloma and malakoplakia as given in table 2.

Table 2: Types of granulomatous inflammation (n=86).

Type of granuloma	Number of cases	Percentages
Tuberculous granuloma	63	73.28%
Cutaneous leishmaniasis	08	9.30%
Fungal granuloma	05	5.81%
Foreign body granuloma	04	4.65%
Leprosy	03	3.48%
Sarcoid granuloma	01	1.16%
Malakoplakia	01	1.16%
Necrobiotic granuloma	01	1.16%

DISCUSSION

Cutaneous chronic granulomatous inflammation frequently presents a diagnostic challenge for histopathologist. Different causes of granuloma may present a similar histologic picture or a similar cause may present in variable histologic picture. The agents causing granulomatous inflammation is usually non degradable organic or inorganic material.[11] In developing countries like Pakistan where majority of people are living in poor socioeconomic conditions, this chronic granulomatous inflammation especially in the form of tuberculosis is essential to diagnose and manage correctly, so that further spread may be prevented, as this is a contagious disease.[12,13]

In this study of 86 cases of cutaneous chronic granulomatous inflammation the age range was from 10-70 years with mean age of 34.5±14.8 years. In a study conducted by Permi et al[8] in Manglore in 2012, the age range was1-87 years with mean age of 33.26±12.64 years. Another study conducted by Pawale et al[12] in 2011 describe age range of 2-70 years with mean age of 31.26±14.64 years. Still another study conducted by Zafar et al[9] in Pakistan in 2008, the age range was 6-70 years with mean age of 29.25 years. In a study conducted by Gautam et al[10] in Nepal in 2011 the age range was 11-84 years with mean age of 47.5 years.

In this study male to female ratio was 1.2:1 and the common age group was 21-30 years. In study conducted by Permi et al[8], male to female ratio was1.09:1 and the common age group was 21-30 years. In another study conducted by Pawale et al[12] show male to female ratio was 1.18:1 and the common age group was 20-29 years. Still another study conducted by Gautam et al[10] has given male to female ratio of 1.7:1 and the common age group involved was 31-40 years.

In this study the most common type of cutaneous granuloma was tuberculous granulomas 63 (73.28%) followed by granuloma of cutaneous leishmaniasis 08 (9.30%), fungal granulomas 05 (5.81%), foreign body granulomas 04 (4.65%), leprosy 03 (3.84%) and each one (1.16%) of necrobiotic granuloma, sarcoid granuloma and malakoplakia.

In a study conducted by Zafar et al[9] in 2008 in Karachi, the commonest granuloma was tuberculous granuloma 92.7% followed by foreign body granuloma 3.3%, sarcoidal granuloma 1.6% and suppurative granuloma 1.6%, necrobiotic granuloma 0.8%.

Another study conducted by Gautam et al[10] has also given tuberculous granuloma as the commonest type 68.9% followed by foreign body granuloma 18.9%, necrobiotic granuloma in 3.7%, suppurative granuloma 2.8% and sarcoidal granuloma in 1.9%.

Another study conducted by Dhar et al[6] in 2002 in India as also reported tuberculous granuloma as the commonest 77.7% followed by sarcoidal granuloma in 13.7 and suppurative granuloma in 9%. In a study conducted by Mohan et al[13] in 2006 in India, tuberculous granuloma is reported as the commonest type 87.7% followed by suppurative granulomas 2.9%, necrobiotic granuloma 2.7%, sarcoidal granuloma 2.6% and foreign body granuloma in 1.7% cases.

Another study conducted by Chakrabarthi et al[14] tuberculous granulomas were 73.12% followed by necrobiotic granulomas in 12.37%, foreign body granuloma 6.45%, suppurative granuloma in 4.68% and sarcoidal granuloma in 1.61% cases.

CONCLUSION

The tuberculous granulomas are the commonest granulomas in district Bannu, Pakistan, specially in 21-40 years of age.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

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