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HISTOPATHOLOGICAL STUDY OF GRANULOMATOUS LYMPHADENITIS

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ABSTRACT

The etiology for Granulomatous inflammation of lymph nodes varies with a wide spectrum ranging from inflammatory causes on one end to malignant on the other. **Aims and objectives:** The present study aimed to find out the various granulomatous lesions of lymph node on histopathology and their clinicopathological findings.**Materials and Methods:** In the present study, 150 cases dignosed on histopathological findings of granulomatous lymphadenitis were analysed .The routine haematoxylin and eosin (H & E) stain was done.The special stains like Ziehl–Neelsen stain,PAS, and Giemsa stain were done wherever needed. **Results**: Maximum cases of granulomatous lymphadenitis were between age group of 21-30 years ,55 cases (37.33 %) ,with female preponderance. The site of lymph node biopsies were from various regions like cervical, axillary, mesenteric, inguinal and others. Maximum cases of granulomatous lymphadenitis were from cervical region. The histopathological diagnosis Tuberculous lymphadenitis- 91.33 %, LGV lymphadenitis- 1.33%, Toxoplasma lymphadenitis- 0.66%, Granuloma Inguinale lymphadenitis- 0.66%, Other granulomatous lymphadenitis- 6.02%.**Conclusion**: Identifying granulomatous inflammation in lymph node biopy and finding the etiology in a biopsy specimen is very important for specific treatment and outcome of the disease. The morphological features and special staining helped us to find the specific etiology of granulomas. The commonest cause of granulomatous lymphadenitis was tuberculosis in our study.

Keywords- Lymph nodes ,Granulomatous inflammation, Necrosis ,Tuberculosis.

Introduction-

A granuloma is a localised collection of inflammatory cells, mononuclear cells predominating often with an epithelioid cells.[1]The multinucleated giant cells are not diagnostic of a granuloma, but should raise one's suspicion of one being present. It is usually formed as a result of the persistence of a non-degradable product of active hypersensitivity. [2]Granulomatous inflammation is a distinctive histomorphologic form of chronic inflammation. A specific scrutiny of such granulomatous lesions is necessary to avoid under diagnosis of a metastatic. We aimed at finding the etiology of all granulomatous lesions in lymph nodes tissue biopsy. Recognisation of granulomatous pattern and finding the etiology in a biopsy specimen is very important for specific treatment and outcome of the disease.[3]

Aims and Objectives: 1) To study the spectrum of granulomatous lesions in lymph node biopsy with clinical correlation.

2) To study etiological factors of granulomatous lesions and

Material and Methods-

We aimed at finding the etiology of all granulomatous lesions in lymph nodes tissue biopsy sent for histopathogical examination.The present study was conducted in department of Pathology, Krishna Institute of Medical Sciences, Karad, to analyse the histomorphological appearance of lymph node biopsies in general and to study the correlation of lympadenitis due to granulomatous lesion in specific.

The biopsy samples were received from various departments of the hospital. Lymph nodes revealed distinct and well-formed epithelioid cell granulomas in all biopsies.The relevant clinical details and laboratory investigations were collected from the hospital case sheets.Five micron thickness sections were obtained from formalin-fixed paraffin wax processed tissues.The cases which were diagnosed as granulomas on Hematoxylin and Eosin stained sections were included in this study . Special stains like Ziehl-Neelsen stain, Gomori's Methenamine silver, PAS, were done whenever required.

Results-We studied 150 cases of lymph node biopsies for features of granulomatous lymphadenitis. Our observations and results are as

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Table- 1.Age and sex wise distribution of the granulomatous lymphadenitis

Age In group	Tuberculosis		LGV		Toxoplasma		Granuloma Inguinale		Other granulomatous Lymphadenitis	
	M	F	M	F	M	F	M	F	M	F
0-10	-	04	-	-	-	-	-	-	02	-
11-20	14	14	-	-	-	-	-	-	01	-
21-30	14	36	02	-	01	-	-	-	03	-
31-40	09	26	-	-	-	-	-	-	02	-
41-50	05	07	-	-	-	-	-	-	-	01
51-60	03	05	-	-	-	-	-	-	-	-
61-70	-	-	-	-	-	-	01	-	-	-
	45	92	02	00	01	00	01	00	08	01
Total - 150 cases	137		02		01		01		09	

Table-2.Site wise distribution of the granulomatous lymphadenitis

Site of lymph node biopsy	Tuberculosis lymphadenitis	LGV lymphadenitis	Toxoplasma lymphadenitis	Granuloma Inguanale lymphadenitis	Other granulomatous lymphadenitis
Cervical	112	-	01	-	08
Axillary	17	-	-	-	01
Mesentric	05	-	-	-	-
Inguinal	01	02	-	01	-
Other	02	-	-	-	-
Total:150 =	137	02	01	01	09

Table-3 .Histopathological dignosis of granulomatous lymphadenitis

No.	Type of granulomatous lymphadenitis	No. of cases	%
1.	Tuberculous lymphadenitis	137	91.33
2.	Lymphogranuloma Venerum lymphadenitis	02	01.33
3.	Toxoplasma Lymphadenitis	01	00.66
4.	Granuloma Inguinale lympadenitis	01	00.66
5.	Other granulomatous lesions	09	06.02
	Total	150	100

In our study majority of patients were seen in the age group of 21-30 years, 55 cases (37.33 %) cases[Table 1]. Females were affected predominantly Male to female ratio was 1:1.7. The site of lymph node involvement were maximum from cervical region[Table 2]..

We reported maximum number of cases of tuberculosis lymphadenitis in our study137 cases 91.33% [Table 3].

Discussion-

Lymph node is affected by various types of lesions, both non-neoplastic (inflammatory) or neoplastic. Lymphadenopathy is a common clinical presentation of patients attending outdoor patient departments. Granulomatous inflammation is caused by a variety of conditions including infection, autoimmune, toxic, allergic, drug, and neoplastic conditions. The granuloma has a significant protective function

Granulomatous inflammation is a distinctive form of chronic inflammation.[4] It is defined by the presence of mononuclear leukocytes, specifically histiocytes (macrophages), which respond to various chemical mediators of cell injury..

The classification of granulomas based on the etiology are : 1. Bacterial 2. Metal induced 3. Fungal 4. Viral , 5.Chlamydial 6.Cat scratch fever 7. Lymphogranuloma venerum 8. Helminthic 9. Foreign body type 10. Unknown cause. [5,6]

While another classification is on infectious or non infectious granulomatous disorders are Infectious --A.Suppurative 1) Tularemia lymphadenitis 2) Cat scratch lymphadenitis 3) Yersinia lymphadenitis 4) Lymphogranuloma venereum 5) Fungal infection

B.Non-suppurative 1) Tuberculous lymphadenitis 2) Atypical mycobacterial infection 3) BCG-lymphadenitis 4) Toxoplasma lymphadenitis (5) Lepra 6) Syphilis 7) Brucellosis 8) Fungal infection (Cryptococcus, Histoplasma, Coccidioidomycosis, etc)

While,Noninfectious granulomatous disorders 1) Sarcoidosis lymphadenitis 2) Sarcoid-like lymphadenitis 3) Berylliosis were done.

Identification and classification of the granulomatous inflammation pattern can be helpful in narrowing a clinical differential diagnosis. However, broad differential diagnoses exist within each category. [7,8,9]

Depending on histomorphological pattern they are classificatied as : Epithelioid , Histiocytic ,Foreign body, necrotizing, non-necrotizing, suppurative, mixed inflammatory etc. is helpful for the clinical differential diagnosis. [10]

Granulomatous inflammation is commonly characterized by the formation of distinct granulomas composed of aggregates of epithelioid histiocytes, with a peripheral cuff of lymphocytes and plasma cells, and occasionally a necrotic center. Careful hematoxylin and eosin and specific stains evaluation can yield identifiable organisms within the necrosis or within histiocytes depending on the etiology. Grocott methenamine silver (GMS) stain , Periodic acid-Schiff (PAS) and Ziehl–Neelsen (AFB) are most commonly employed for the identification of fungi and acid fast bacilli.

Tuberculous lymphadenitis

The term “caseous” refers to a type of necrotizing granulomas in which the central necrotic material has a “cheese-like” consistency.Tuberculosis remains a major public health problem. Mycobacteria species are the most common etiologies of necrotizing granulomas .[11,12] About 90% of tuberculous lymphadenitis mainly appears in the cervical lymph node.The histological features were granuloma formation consists of giant cell , caseation necrosis,macrophages, epithelioid cells , lymphocytes , and histiocytes infiltration.

On histopathology, the lymph nodes were studied for the presence of granuloma. They were divided into two groups - Well-organized granulomas were characterized by a central group of epitheloid histiocytes, Langhan's giant cells, a mantle of lymphocytes and fibrous tissue and poorly organized granulomas showed a diffuse mixture of lymphocytes, histiocytes, and plasma cells with occasional giant cells.

We reported maximum number of cases of tuberculosis lymphadenitis in our study.The diagnosis of tuberculous lymphadenitis done on biopsy, other supported with positive tuberculin test, chest radiograph, CT scan, cytology, AFB staining, and mycobacterial culture are taken into considerations. Mycobacterium TB through Ziehl–Neelsen acid-fast stain and culture in Loewenstein–Jensen in association with clinical and imaging findings compatible with infection . [13] Few cases it is difficult to find acid-fast bacillus ,negative for acid-fast bacillus or the failure to culture Mycobacterium TB should not exclude the diagnosis. [14]

Toxoplasma Lymphadenitis - Toxoplasmosis is a common zoonosis caused by Toxoplasma gondii ; it is found worldwide, and is prevalent in warm and humid climates. Toxoplasma gondii mainly exists in humans in two forms, namely, tachyzoites within macrophages in the circulation and bradyzoites within intracellular cysts. The organism Toxoplasma gondii is a common

cause of lympadenopathy in adults. Toxoplasmic lymphadenitis is diagnosed histologically and confirmed by serologic assays.we had a cases of toxoplasmic lymphadenitis presented with fever and lymphadenopathy.

We reported case of cervical lympadenopathy in adult. The characteristic main three histological findings of lymph node were florid reactive follicular hyperplasia, cluster of epithelioid cells and patches of monocytiod B cell proliferation.The localized posterior cervical lymphadenopathy with fever is a common symptom. [15]

Granuloma Inguinale lymphadenitis- Donovanosis is caused by Klebsiella granulomatis, Gram-negative bacilli. It is characterized by an ulcerating lesion in the genital or perianal region. The bacteria which exhibit vacuolated macrophages with telephone handle appearance due to bipolar condensation of the chromatin when stained with Wright or Giemsa stain .

Lymphogranuloma venereum lymphadenitis it is caused by Chlamydia trachomatis (seroversion L1, L2, L3). It is characterized by a self-healing genital ulcer. It causes inguinal lymphadenitis. We reported case of painful inguinal lymphadenopathy with fever .On histopathology the lymph nodes show stellate neutrophilic abscess surrounded by palisading granulomatous inflammation.

Also cases of granulomas are noted in Fungal infection ,Tularemia , Cat scratch , Yersinia, Lepra , Syphilis , Brucellosis etc related lymphadenitis.Granuloma in lymph node with co-existent HIV infection should be carefully looked for.[16].

The tissue reaction pattern narrows the pathologic and clinical differential diagnosis and subsequent clinical management. Recognisation of the granulomatous pattern in a biopsy specimen is important because of the limited number of possible conditions that cause it and adequate treatment is possible.[17]

The specific diagnosis of granulomatous lymphadenitis is sometimes difficult with the histological appearance of the lesion and it requires the correlation of clinical , laboratory data ,special stain,advanced technics, etc to reach the diagnosis.

Conclusion-The histologic identification of granulomatous inflammation is a helpful for diagnostic etiology. Recognisation of granulomatous pattern and finding the etiology in a biopsy specimen is very important for specific treatment and outcome of the disease. The commonest cause of granulomatous lymphadenitis were tuberculosis. Thus we conclude that histopathological examination of granulomatous lesions helped us to find the exact etiology of granulomas in lymph nodes.

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