VOLUME - 12, ISSUE - 05, MAY - 2023 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Histopathology

GAMUT OF GRANULOMATOUS LESIONS OF NORTH KARNATAKA - A HISTOPATHOLOGICAL STUDY

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ABSTRACT **Background:** Tuberculosis remains the leading cause of death from an infectious disease among adults worldwide, with more than 10 million people becoming newly sick from tuberculosis each year. Advances in diagnosis, including the use of rapid molecular testing and whole-genome sequencing in both sputum and non-sputum samples, could change this situation. The granulomatous inflammatory response is ubiquitous in pathology, being a manifestation of many infective, toxic, allergic, autoimmune and neoplastic diseases and also conditions of unknown aetiology. **Objective:** To study histopathological spectrum of the granulomatous lesions. **Methods:** Retrospective study was done on total 43 cases for one year in department of Pathology. **Results:** In present study, granulomatous lesions are common in second decade of life with male predominance. Most commonly lymph node was the site affected by granulomatous lesions. Conclusion: Granulomatous reaction patterns are frequently encountered in pathology and results from several etiologies. An apt clinical history, meticulous histolopathological evaluation, and good clinicopathological correlation are of utmost importance in arriving at the final diagnosis. Culture of microbes, special stains, and molecular methods for detection of nuclear antigens and nucleic acids may also be necessary. Thorough clinical evaluation, with pathological correlation helps in diagnosing the disease early and proper early management can be started with the help of other ancillary studies. Due to lack of knowledge in society, the treatment failure chances are high. So, early the diagnosis better the management and care of the patient.

KEYWORDS : Tuberculosis, Granulomatous inflammation, Epithelioid cell

INTRODUCTION:

The granulomatous inflammatory response is a special type of chronic inflammation characterised by focal collections of macrophages, epithelioid cells and multinucleated giant cells.1 In usual H&E preparations, some of the activated macrophages in granulomas have pink, granular cytoplasm with indistinct cell boundaries; these are called epithelioid cells because of their resemblance to epithelia2. This results from an inflammatory process to an antigen that is persistent or difficult to remove. In simpler term, granuloma formation is a cellular attempt to contain offending agent that is difficult to eradicate and degrade by the mononuclear phagocyte system. The granulomatous inflammatory response is a manifestation of many infective, toxic, allergic, autoimmune, neoplasm and conditions of unknown aetiology3. Amongst these, infection caused by mycobacterium tuberculosis is the most common infective etiology. Two most important histological findings in granulomatous lesions include caseation and non-caseation necrosis. The presence of caseation necrosis is strongly associated with Mycobacteria species. It has been suggested that during an early phase of the suppurative granuloma formation there is an initial phase of T-cell-mediated immune response4. Globally, it is estimated 10 million people developed active tuberculosis (TB) disease in 2019, with 1.2 million TB deaths among HIV-negative people and an additional 208, 000 deaths among people living with HIV. The WHO regions of South-East Asia (44%), Africa (25%), and the Western Pacific (18%) had the most people with TB5.The provocative agents of granulomatous inflammation appear to be non-degradable by both neutrophils and non-active macrophages. For such degradation, the action of transformed macrophages which are formed with the help of the CD 4+ T cells is required. The CD 4+ T cells secrete various mediators such as IL 2, IF□, TNF and lymphotoxin for the transformation of the macrophages into epithelioid cells and giant cells6. To diagnose granulomatous inflammation multidisciplinary approach is needed. Clinical diagnosis, microbiological, serological and histopathological for interpretation.

MATERIALS & METHODS:

It is a one-year retrospective study, from July 2021 to July 2022. The data was collected from the department of Pathology. All the cases diagnosed as granulomatous lesions were retrieved. Slides were reviewed; clinical data (i.e. age, gender, underlying disease and clinical presentation) were taken from the record section.

RESULTS:

Table 1: AGE DISTRIBUTION

AGE	Frequency	Percentage (%)
<20 Years	10	23.26%
21-40 Years	22	51.16%
41-60 Years	8	18.60%
>60 years	3	6.98%
Total	43	100%

Majority of the patients (22/43, 51.16%) of the granulomatous lesions were present between 2nd – 4th decade.

Table 2: SEX DISTRIBUTION

Sex	Frequency	Percentage
Male	22	51.16%
Female	21	48.84%
Total	43	100%

Majority of the patients were seen in Males (22/43, 51.16 %).

Table 3: SITE DISTRIBUTION

Site	Frequency	Percentage
Respiratory System	4	9.30%
Gastro-intestinal System	12	27.90%
Lymphoreticular System	15	34.88%
Central Nervous System	2	4.65%
Reproductive System (Male & Female)	8	18.60%
Liver	2	4.65%
Total	43	100%

Most common site found was Lymphoreticular system (15 cases, with 34.88%).

Table 4: HISTOPATHOLOGICAL DIAGNOSIS

Final histopathological Diagnosis	Frequency	Percentage
Features suggestive of tuberculosis	29	67.44%
Inflammatory lesion with granulomatous reaction	8	18.60%
Foreign body granulomatous reaction	4	9.30%
Tuberculoma	2	4.65%
Total	43	100%

Most common Histopathological diagnosis was features suggestive of tuberculosis (29 cases with 67.44%)

Table 5: AFB POSITIVITY

AFB	Frequency	Percentage
Positive	20	46.51%
Negative	23	53.48%
Total	43	100%

Majority of the cases were AFB Negative (23/43) 53.48%.

DISCUSSION:

Granulomas are evolutionarily ancient structures found throughout both vertebrate and invertebrate species and are likely to have evolved as a protective mechanism to destroy or encapsulate foreign material[7]. It can be best analysed when viewed in the light of how granulomas develop. These are endemic worldwide and the prevalence of infections including atypical mycobacterial infections has increased with HIV epidemic in almost all countries, especially India and sub-saharan Africa. In developed countries, increased intercontinental travel, migration and increased number of immune-compromised patients of all types have fostered the resurgence of mycobacterial infections. Tuberculosis is considered first in the differential diagnosis of granulomatous diseases, in this geographic region, but it is always required to confirm by detailed analysis of clinical and ancillary studies to rule out other granulomatous diseases[8] .Tuberculosis has become remarkable as a re-emerging infectious disease not only in developing countries but worldwide[9]. The most common sites where surgical pathologists encounter granulomas are the skin and subcutaneous tissues, lymph nodes, and lungs[10]

Granulomas are reportedly present in 2% to 10% of all liver biopsy specimens examined in general practice, and of those, it is reported that 13% to 36% have no discoverable etiology even after extensive evaluation of the specimen and the patient[11] .The risk of extrapulmonary tuberculosis and mycobacteremia increases with advancing immunosuppression[12].Unique features of AIDS-associated tuberculosis include extra-pulmonary disease, disseminated disease, rapid progression, visceral lymphadenopathy, tissue abscesses, and negative tuberculin skin test[13].Thorough Clinical, and pathological evaluation narrows down the differential diagnosis and subsequent clinical management. In the present study, most of the people were in age group from 21-30 years which was similar to study done by Akanksha Kushwah et al [14] .The majority of the patients were in the age group of 20-29 years. In the present study, incidence of granulomatous lesion were more common in males than females which was correlating with study of R. Vimal Chander et al[8] . In the present study, the most common site which was encountered was lymphoreticular system (15 cases) which was correlating with study of Akanksha Kushwah et al[14] . Out of 43 patients, 29 cases showed features of tuberculosis, out of which 20 were positive for Acid-fast bacilli and 23 were negative. 4 cases showed foreign body granulomatous reaction (which included 2 cases of fungal infection which was confirmed by staining with PAS and GMS stains). Ziehl-Neelsen stain for acid-fast bacilli is positive only in around one-third to one-fourth of the cases with confirmed tuberculosis infection. In our study, a case of fungal granuloma, candida and cryptococcal was identified in a 48 year female. We received an irregular mass of tissue measuring (3x2)cms, external surface showed tiny pinpoint spots and congestion. On cut section homogenous areas were seen. Microscopically mixed inflammatory infiltrate were seen, giant cells were seen which were refractile. PAS and GMS were done which was positive.

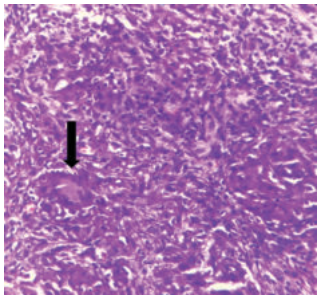


Figure 1: Typical tuberculous granuloma showing an area of necrosis surrounded by langhans-type giant cell, epithelioid cells and lymphocytes.

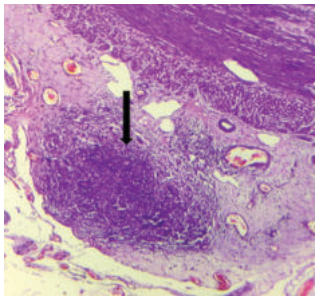


Figure 2: Microscopic picture of appendix with epithelioid cell granuloma and dense lymphocytic infiltrate seen in the serosa (arrow).

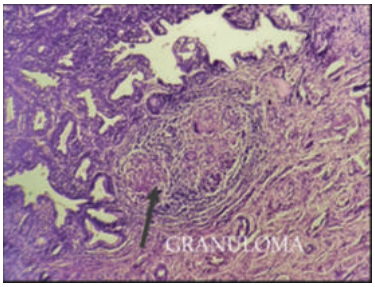


Figure 3: Microscopic picture of endometrium with granulomas- Endometrial Tuberculosis.

Figure 4: Microscopic picture of testis with multiple granulomas. Inset shows langhan type of giant cells, surrounded by epithelioid cells, lymphocytes.

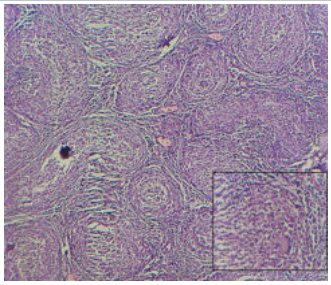


Figure 5: Microscopic picture of AFB positive.

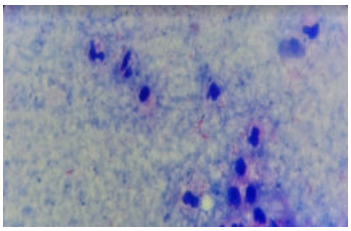


Figure 6: Microscopic picture showing dense inflammatory infiltrate along with refractile body- Cryptococcus (arrow).

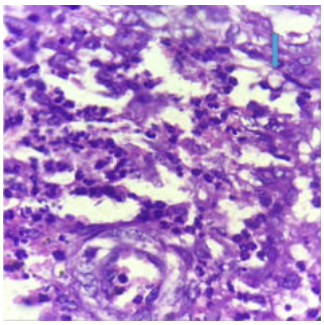
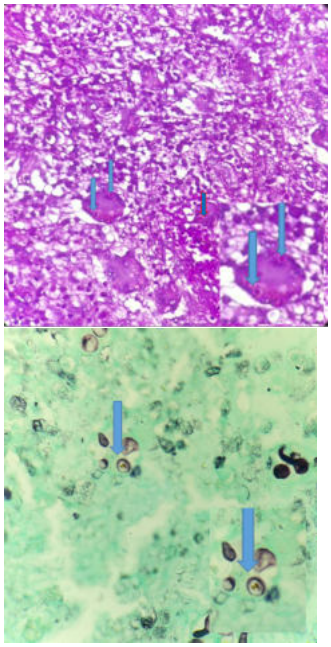


Figure 7: PAS Stain and GMS highlighting the Cryptococcus (arrow).



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