proceedings

Abstract

Biopsy Confirmed Pulmonary Sarcoidosis in Thunder Bay District, Representative of Northwestern Ontario †

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Background:

Sarcoidosis is a multi-systemic granulomatous disorder that most commonly involves lungs (hilar and mediastinal lymphadenopathy, parenchymal reticulonodular opacities and fibrosis) but also can involve almost every organ. Its pathophysiology is unknown but thought to be caused by the formation of non-caseating granulomas in response to unknown triggers in a genetically susceptible host. Proposed triggers include environmental exposures (mold, pesticides) and occupational exposures (silica dust, metal dust), infectious agents (Propionibacterium, mycobacterium) and endogenous proteins. Overall sarcoidosis incidence in Ontario was 6.8/100,000 in 2014 [1] where global sarcoidosis incidence is 1–35.5/100,000 per year [2]. Sarcoidosis is more commonly seen in Black Americans and Northern Europeans. Northwestern Ontario has a unique ethnically diverse population consisting of a large Indigenous population and European immigrants, in addition to being a major site for heavy metal mining and forest-related industry.

Methods:

We performed a retrospective 10-year (2012–2022) chart review of cases undergoing mediastinal and hilar lymph node biopsy at TBRHSC, which is the only center performing this procedure in the Thunder Bay District. Cases with non-caseating granulomas in their lymph node biopsies who had negative pathology for malignancy as well as negative microbiology (culture and staining including AFB staining) for infections including NTM and TB were considered biopsy-confirmed pulmonary sarcoidosis and were enrolled in this study.

Results:

Out of 562 hilar lymph node biopsies acquired by either EBUS or EUS-B between 2012 and 2022, 74 individuals (33 F, 41 M) met the criteria for biopsy-confirmed pulmonary sarcoidosis, yielding an incidence rate of 4.9/100,000 per year. The patient distribution was 44.6% female and 55.4% male, with no significant variance in incidence across genders ($p > 0.05$).

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Discussion:

At first glance, sarcoidosis incidence rate in the Thunder Bay District seems lower than sarcoidosis incidence in Ontario, at 4.9/100,000 per year vs. 6.8/100,000 [1].

The definition of sarcoidosis in Lee M Fidler's study included:

1. Sarcoidosis and two or more physician claims within 2 years (18,550 cases);
2. Chronic sarcoidosis and five or more physician claims within 3 years (9199 cases);
3. Sarcoidosis with histology and two or more physician claims (3819, 20% of total cases).

Therefore, our report shows a significantly higher incidence rate of biopsy confirmed pulmonary sarcoidosis in the Thunder Bay District as representative of Northwestern Ontario compared to the rest of Ontario (4.9/100,000 vs. 1.3/100,000).

Limitation:

Our report may be undercounting the overall incidence of sarcoidosis in the Thunder Bay District as representative of NW Ontario due to the following reasons:

- Lymph node biopsies, although the gold standard in confirming sarcoidosis diagnosis, are not always required, such as in cases with asymptomatic bilateral hilar lymphadenopathy subtypes and Lofgren and Heerfordt syndromes, and in cases with non-caseating granuloma in the cutaneous or hepatic samples. On the other hand, EBUS-TBNA and EUS-B-FNA can miss around 30% of cases.
- Culture and staining are not the most sensitive methods for diagnosing TB and NTM. PCR is the most sensitive method, which was not used on the samples. This is especially important in the Thunder Bay District given the high rate of TB and NTM infection compared to other parts of Ontario.
- Diagnosis of sarcoidosis requires compatible clinical and pathological findings along with exclusion of other causes. Lack of proper exposure history and follow-up over time to observe the natural history of the disorder or the response to treatment is a significant limitation.

Opportunities and Future Directions:

Future research on biopsy confirmed pulmonary sarcoidosis cases with precise past exposures history and clinical follow up will shed light of the triggers of sarcoidosis and may lead to sarcoidosis prevention by exposure avoidance.

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