Original article:

Study of etiological factors of TB pleuritis in Indian population

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Abstract:

Introduction: Pulmonary tuberculosis is the most frequent cause of death by an infectious agent worldwide. Among the extrapulmonary presentations after tuberculous lymphadenitis, pleural tuberculosis is the second most frequent.

Methods and materials: The present study was conducted at Navodaya Medical College, Raichur during the period between January 2011 and December 2011. 130 consecutive pleural fluid specimens from patients admitted to medical, surgical, gynaecologic, and paediatric wards were analysed.

Results: Although 120 samples were received for analysis, 30 patients were excluded due to diagnosis of hemothorax (2), grossly turbid empyemas (6), or transudative effusions (22). The remaining 90 patients consisted of 62 men (68.9%), 28 were women (31.1%). The age of the study population ranged from 2months to 78years.

Conclusion: TB pleurisy is traditionally diagnosed by either identification of *M tuberculosis* in pleural fluid and/or biopsy specimen cultures or from the presence of granulomas in the pleural biopsy tissue. Pleural fluid cultures have a sensitivity 20-30%

Introduction

Pulmonary tuberculosis is the most frequent cause of death by an infectious agent worldwide. Among the extrapulmonary presentations after tuberculous lymphadenitis, pleural tuberculosis is the second most frequent. Failure to diagnose and treat pleural tuberculosis can result in progressive disease with the involvement of other organs in as many as 65% of patients. Conventional methods have proven to be insufficient for diagnosis of pleural tuberculosis. Direct examination of pleural fluid is inefficient because sensitivity is about 1%[1]. Pleural fluid culture is more sensitive than direct examination but Mycobacterium tuberculosis requires 4-6 weeks to grow. Pleural effusions may arise secondary to pulmonary or systemic disease and their development is classically associated with an influx of inflammatory cells into the pleural space[4]. Lymphocytes predominate in malignant and tuberculous pleural effusions[1-3].

Methods and materials

The present study was conducted at Navodaya Medical College, Raichur during the period between January 2011 and December 2011. 130 consecutive pleural fluid specimens from patients admitted to medical, surgical, gynaecologic, and paediatric wards were analysed.

Inclusion criteria:

All exudative pleural effusion cases

Exclusion criteria:

1. Patients with transudative pleural effusion
2. Patients with malignant pleural effusion
3. Patients with immunodeficient states like HIV/AIDS, those on chemotherapy were excluded

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4. Patients having hemothoraces or empyemas too turbid for analysis were excluded

Observation

Although 120 samples were received for analysis, 30 patients were excluded due to diagnosis of hemothorax (2), grossly turbid empyemas (6), or transudative effusions (22). The remaining 90 patients consisted of 62 men (68.9%), 28 were women (31.1%). The age of the study population ranged from 2months to 78years.

Table No.1 : Showing age distribution

Age	Frequency	Percent
0-10	06	6.7
11-20	10	11.1
21-30	30	33.3
31-40	13	14.4
41-50	09	10.0
51-60	08	8.9
61-70	12	13.3
71-80	02	2.2
Total	90	100.0

Table No.2: Showing sex distribution

Sex	Frequency	Percent
Female	28	31.1
Male	62	68.9
Total	90	100.0

Table No.3 : Showing sex distribution

	Female	Male	Total
0-10	4	2	6
11-20	4	6	10
21-30	9	21	30
31-40	3	10	13
41-50	2	7	9
51-60	2	6	8
61-70	4	8	12
71-80	60	2	2
Total	28	62	90

Use ROC Curve to determine at what shade the physician should assume that the patient is improved.

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The area under the curve represents the probability that the assay result for a randomly chosen improved case will exceed the result for a randomly chosen not improved case.

Table No.4 : Showing correlation coefficient

	Correlation coefficient (r) ADA with	95% Cl for r
L/N ratio	0.23*	0.02926 to 0.4215

Statistical Analysis

Mean and standard deviation for continuous variables and proportions for categorical variables are reported. ADA alone, L/N alone and ADA values were then combined with various L/N ratios and evaluated at various cutoff levels for ADA and L/N ratios by calculating sensitivity, specificity, ppv, npv, and efficiency. An interactive dot diagram was used for cut-off points and plot versus criteria values graph was used. SPSS version 16.0 was used for statistical analysis.

Discussion

As already mentioned, malignant effusions may also be associated with high lymphocyte counts[4,5]. The distinction between malignant and tuberculous effusions can usually be made on the grounds of ADA activity. In general, malignant effusions have lower ADA levels than those found in TB. However, effusions secondary to lymphomas and leukemias were generally associated with higher ADA activities than non-hematologic malignancies, and could be confused with tuberculous effusions on the grounds of ADA and L/N ratios.

Another source of false-positives could be rheumatoid pleuritis. Rheumatoid pleurisy appears to be a unique entity in that it could not be differentiated from pleural TB on the basis of ADA activity alone. In addition to studying the ADA activity in these patients, Ocana et al[6]also determined differential counts on these effusions.

TB pleurisy is traditionally diagnosed by either identification of *M tuberculosis* in pleural fluid and/or biopsy specimen cultures or from the presence of granulomas in the pleural biopsy tissue. Pleural fluid cultures have a sensitivity 20-30%[7], pleural biopsy specimens 50-80% [8,] depending upon the clinician's proficiency. Because of the long culture periods required, clinical and therapeutic decisions are often made before these laboratory results become available. Polymerase chain reaction, having a sensitivity of 78% for active disease[9], has not been found to be an efficient alternative. Use of ADA level especially in conjunction with the L/N ratio, is therefore a valuable diagnostic tool in this regard, as it provides a rapid and accurate means of detecting TB pleurisy.

Conclusion:

TB pleurisy is traditionally diagnosed by either identification of *M tuberculosis* in pleural fluid and/or biopsy specimen cultures or from the presence of granulomas in the pleural biopsy tissue. Pleural fluid cultures have a sensitivity 20-30%

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