



A STUDY OF DIAGNOSTIC VALUE OF PLEURAL FLUID ADA IN VARIOUS ETIOLOGY OF PLEURAL EFFUSION:

General Medicine

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ABSTRACT

For etiological diagnosis of pleural effusion various methods are available from examination of pleural fluid to pleural biopsy. ADA is the enzyme that catalyzes the conversion of adenosine to inosine, which is predominant in T-lymphocyte, and its plasma activity is high in diseases in which cellular immunity is stimulated. There are few studies showing importance of pleural fluid ADA in diagnosis of etiology of pleural effusion. Considering this a prospective study, was designed to find out how much is pleural fluid ADA level is helpful in establishing the diagnosis of pleural effusion. If 40 IU/L is taken as cut off value for exudative pleural effusion then, sensitivity is 95.97%, specificity is 89.53%, positive predictive value is 94.08% and negative predictive value is 92.77%. Mean value of ADA in 149 diagnosed case of tubercular pleural effusion is 72.4 IU/L. & in 101 patients of non-tubercular pleural effusion is 23.6 IU/L.

KEYWORDS

1. Pleural Effusion 2. ADA

INTRODUCTION:

Pleural effusion is accumulation of fluid in pleural space. It can be transudative or exudative in nature. ADA enzyme catalyzes conversion of adenosine to inosine. ADA has two iso-enzymes, ADA1 & ADA2. The increase in ADA activity with tuberculous pleuritis is mainly due to ADA2, which is because most of the cells in pleural fluid are lymphocytes. [1] ADA level can also elevated in diseases like empyema, rheumatoid pleuritis & rarely in some case of malignancy in addition to tuberculosis. ADA is helpful for establishing the etiology of tubercular pleural effusion & rule out other diagnosis in which lymphocytes predominance seen as in case of malignancy and collagen vascular diseases [2]. Pleural fluid adenosine deaminase (ADA) has thus become an important diagnostic tool in the evaluation of exudative pleural effusions because it is rapid and easily available.

MATERIAL & METHOD:

This is a prospective study carried out over period of 1 year during July 2018 to July 2019. Patients attending to OPD of department of respiratory medicine, L.G. Hospital were subjected to blood investigations, chest x-ray and ultrasonography of chest and sputum examination according to clinical condition of patients. 250 patients of pleural effusion who gave consent for the study were enrolled in the study. Thoracentesis was done & pleural fluid was sent for routine microscopic examination, culture sensitivity examination, ADA, cytology & MGIT. Data was collected & analysis was done.

AIMS AND OBJECTIVE:

To study the diagnostic value of pleural fluid ADA in various etiology of pleural effusion.

INCLUSION CRITERIA:

- Patients with pleural effusion
- Patients who gives consent for study

EXCLUSION CRITERIA:

- Patients with empyema
- Patients who did not give consent for study

RESULT:

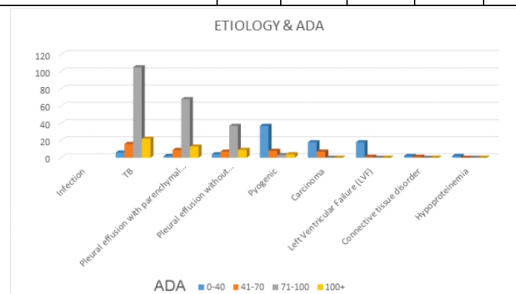
Among 250 patients were enrolled in my study, 136 patients were male & 114 patients were female.

AGE GROUP	TOTAL	MALE	FEMALE
11-20	13	8	5
21-30	64	38	26
31-40	40	28	12
41-50	52	25	27
51-60	36	17	19
61-70	32	14	18
71-80	8	4	4
81-90	5	2	3

Mean age is 43.7 with standard deviation 17.01. Majority of the patients were between 21 to 70 years of age.

143 patients of TB pleural effusion have ADA value more than 40 IU/L. Only 6 patients have less than 40 IU/L ADA value were diagnosed as TB pleural effusion & that diagnosis was done by MGIT. 37 patients with pyogenic pleural effusion had ADA less than 40 IU/L while other 15 patients have more than 40 IU/L ADA but does not have TB. Majority of patients with carcinoma, Left ventricular failure, connective tissue disorder & hypoproteinemia have ADA value less than 40 IU/L.

Etiology	ADA				Grand Total
	0-40	41-70	71-100	100+	
Infection					
TB	6	16	105	22	149
Pleural effusion with parenchymal lesion	2	9	68	13	92
Pleural effusion without parenchymal lesion	4	7	37	9	57
Pyogenic	37	8	3	4	52
Carcinoma	18	7	0	0	25
Left Ventricular Failure (LVF)	18	1	0	0	19
Connective tissue disorder	2	1	0	0	3
Hypoproteinemia	2	0	0	0	2
Grand Total	83	33	112	26	250



If 40 IU/L is taken as cut off value for exudative pleural effusion then, sensitivity is 95.97%, specificity is 89.53%, positive predictive value is 94.08% and negative predictive value is 92.77%

Mean value of ADA in 149 diagnosed case of tubercular pleural effusion is 72.4. Mean value of ADA in 101 patients of non-tubercular pleural effusion is 23.6. $p > 0.05$ in cases where ADA value is > 40 (Exudative effusion).

28% of patients of carcinoma, 5.26% of left ventricular failure had ADA value more than 40.

DISCUSSION:

Pleural fluid ADA has long been used as a marker for tuberculous pleurisy. Three different studies by Ribera E at al.[3], Valdes L at al[4] & Muranhisi H at al[5] states levels of ADA in pleural fluid >40 IU·L⁻¹ can indicate pleural tuberculosis with sensitivity (81–100%) and specificity (83–100%) which is comparable to present study in which sensitivity is 95.97% & specificity is 89.53%.

A study by Asmita A. Mehta at al showed, Pleural fluid ADA >40 U/l yielded 85.7% sensitivity, 80.8% specificity, 75% positive predictive value and 89.5% negative predictive value, which is comparable to present study.[6]

Biswjit Biswas at al. showed, 5.6% patients of carcinoma had ADA >40 U/l whereas in present study it is 28%. These difference is mostly due to less numbers of carcinoma in present study. [7]

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