



Low Adenosine Deaminase Level in Pleural Effusion and it's relation to Malignancy Amongst Population of Central India

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ABSTRACT

Adenosine deaminase (ADA) level in non -tubercular pleural effusion rarely exceed cut-off set for tubercular effusion. We conducted a study with the aim of study to find correlation of low pleural fluid with disease and ascertain if it can be used as predictor of malignancy. A Retrospective Observational study of Records of Pleural effusion at Respiratory Medicine ward in our institute during period 1st July 2015 to 30 June 2017. Out of this 140 records 40 were identified with a low ADA value (<40 IU/L), all value measured using same-Colorimetric method. Mean value associated with malignancy was 23.66 IU/L. Low pleural fluid ADA was associated most commonly with malignancy in 20 cases and other causes included synpneumonic effusion and disseminated tuberculosis. Effusion were likely to be malignant when hemorrhagic in colour (p- value is <0.0001) This study concluded that, a low pleural fluid ADA (<40/IU/L) is not useful when used alone as predictor of malignancy .However if low value of ADA is associated with hemorrhagic colour- a caution should be observed to rule out malignancy with further diagnostic workup

Keywords: Adenosine Deaminase, Malignancy, Hemorrhagic pleural effusion.

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INTRODUCTION

Adenosine deaminase is an enzyme that converts adenosine to inosine .^[1] Adenosine deaminase(ADA)levels in non-tuberculous lymphocytic pleural effusions rarely exceed the cut-off set for tuberculous effusion value.^[2] Low ADA levels in lymphocytic pleural effusions virtually excludes the diagnosis of tuberculosis.^[2] . Approximately 15% lung cancer cases have a pleural effusion at their first presentation to hospital .During the course of this disease, at least 50% of patients with disseminated lung cancer develop a pleural effusion.^[3] Pleural fluid ADA level is one of frequently performed investigation for pleural effusion. A low ADA adequately excludes the diagnosis of tuberculosis in high prevalence regions. ^[4] The aim of study is to find correlation of low pleural fluid with disease and ascertain if it can be used as predictor of malignancy.

MATERIAL AND METHOD

Retrospective Observational Study of Records of 140 indoor cases Of Pleural effusion at Respiratory medicine ward in our institute during period from 1st July 2015 to 1st June 2017. Out of these 40 (n= 40) records were identified with a low ADA value (<40 U/L in present study). Pleural fluid ADA was measured with same method in all cases (Colorimetric Method). ADA level was studied for its Relation to diagnosis. Infection other than pulmonary tuberculosis was suspected etiology when pleural fluid culture showed growth of organism and patient treated with antibiotics.

RESULTS

Low ADA was more common in males as compared to female. Lowest ADA value in patients with confirmed lung malignancy was noted as 10.5IU/L, whereas highest value in same set was 37.5 IU/L, Mean value of ADA in malignancy associated effusion was 23.66.IU/L. Low pleural fluid ADA was most commonly associate with Malignancy 20 cases(50%) followed by Coexisting sputum positive pulmonary tuberculosis- 6, proven EPTB- 4, Infection other than pulmonary TB-7, undiagnosed -3 (Image 1). All of pleural effusion were lymphocyte predominant except for two cases. Hemorrhagic colour of pleural effusion was significantly associated with malignancy 18 out of 20 cases (Image 2) in cases with low pleural fluid ADA (The *p*-value is < .00001).Study of history revealed overtreatment of 5 cases with antitubercular drugs before final diagnosis of malignancy was made.

DISCUSSION

Malignant pleural effusions most commonly arise from metastatic carcinomas from outside the pleura, but can also originate from primary pleural neoplasms.^[3] Adenocarcinoma is the most common histological type for malignant pleural disease with an unknown primary source^[3]. Observations suggest that the origin of the pleural fluid ADA is probably in the pleural tissues rather than the cells in the pleural fluid.^[3]

Pleural fluid ADA of > or =50 U/ L was 95% sensitive and 89% specific for diagnosing tubercular etiology of pleural effusion in a study conducted in 2003 by Diacon AH.^[5] In observations made by Zay soe at al and found - Mean ADA activity (SD) in malignant pleural effusion as 23.83U/L.^[6] The median value of ADA in malignant pleural effusion was 19 U/L in Japanese study by Yoshiko ogata et al.^[7] Mean ADA value in our study is 23.66IU/L. Nariman A.Helmy et all found in his study mean level (SD) of ADA was 83.5 ± 50.3 U/L in tubercular pleural effusion and 28.7 ± 23.6 U/L in malignant pleural effusion.^[8] Thus, studies in past have found similar results to that of our study.

A pleural effusion may be called hemorrhagic if it contains an admixture of blood large enough to be seen macroscopically. ^[9] Neoplasms of the pleura were found to be the most frequent cause of hemorrhagic pleural effusion , Seventy-eight (65%)of the 120 patients suffered from malignant neoplasms in a study by Berliner K et al. ^[9] similarly in our study most of the pleural effusion with malignant etiology were hemorrhagic.

Adenocarcinoma was commonest type of cancer in our study (12 cases)- finding consistent as per literature. ^[3].Pleural fluid examination for malignant cell has additional positive results for malignancy with Cell block method. Udasimath et all found, cellularity and additional yield for malignancy was 15% more by the CB method.^[10]Our study detected addition 4 cases of malignancy with cell block method which were negative for malignancy in routine cytology smear.

CONCLUSION

This study conclude that, a low pleural fluid ADA (<40/IU/L) is not useful when used alone as predictor of malignancy .However if low value of ADA is associated with hemorrhagic colour- a caution should be observed to rule out malignancy with further diagnostic workup.

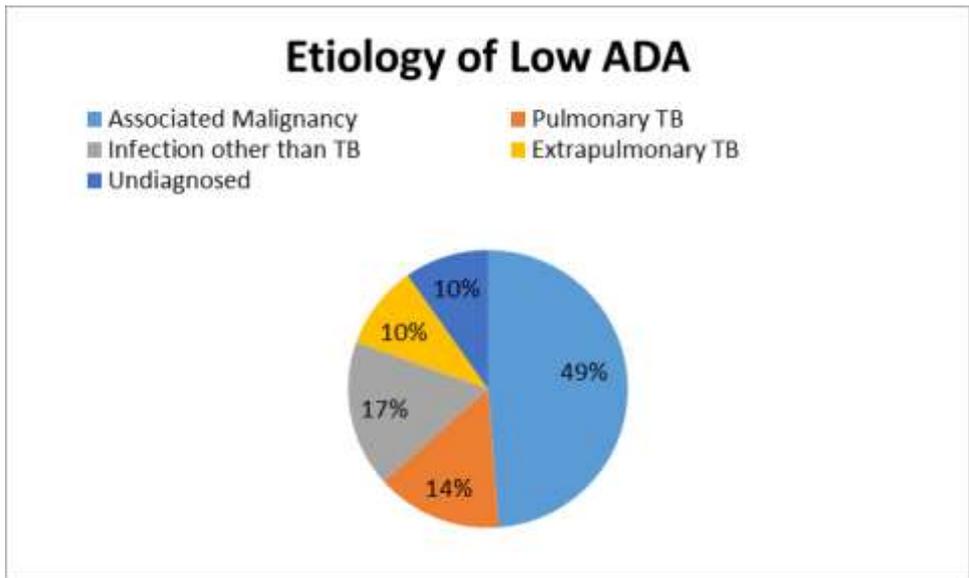


Image 1: Showing distribution of Low Pleural fluid ADA & final Diagnosis.

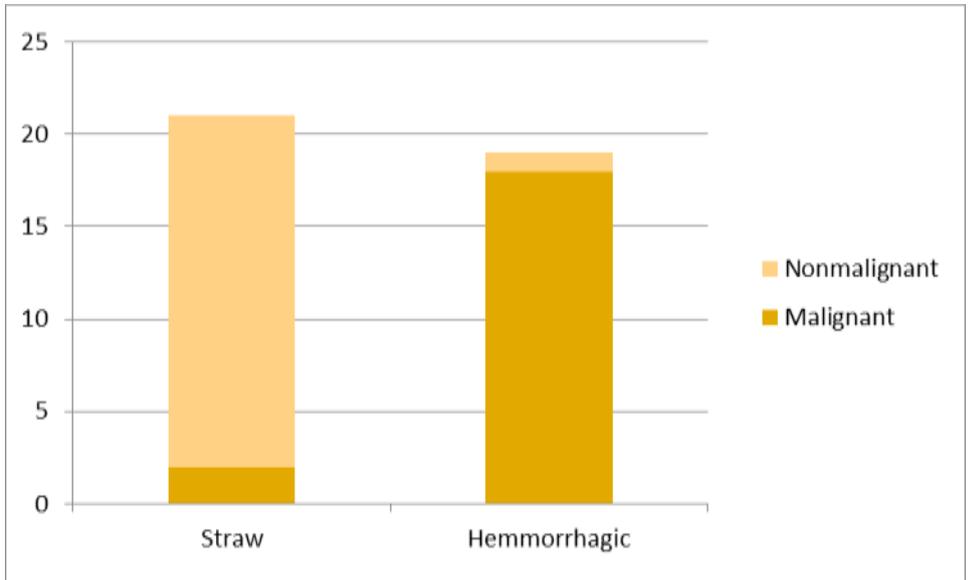


Image 2: Showing Hemorrhagic pleural effusion with low ADA value to be associated with Malignancy.

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