ABSTRACT

Introduction: Tuberculous pleurisy is one of the most common forms of extrapulmonary tuberculosis (TB). Measurement of adenosine deaminase (ADA) level in the effusions is advocated to have a high diagnostic yield in the diagnosis of tuberculous pleurisy as well as pericardial and peritoneal effusions due to TB. The diagnostic yield of ADA measurement in other materials such as abscess content has never been published before. Case report: In this report we present a case of tuberculous pleurisy in whom ADA level in the pleural fluid was not higher than expected while it was very high in the drained material of cold abscess due to TB. Conclusion: To the best of our knowledge this is the first case study reporting the measurement of ADA in the content of a cold abscess due to TB. In conclusion, we suggest that ADA measurement in all kinds of liquid or caseous material other than effusions may have a diagnostic role in TB.

Keywords: Tuberculosis, Pleura, Adenosine deaminase, Effusions, Cold abscess

INTRODUCTION

Tuberculosis (TB) is a common health problem, in most part of the World including Turkey [1]. Tuberculous pleurisy is one of the most common forms of extrapulmonary TB [2]. Closed pleural biopsy by Abraham’s or Cope needle is the most common method used for the diagnosis of tuberculous pleurisy. Demonstration of caseous or noncaseous granulomatous inflammation in the sampled pleural tissue is the hallmark of the diagnosis [2].

Recently, a relatively noninvasive method, pleural fluid adenosine deaminase (ADA) measurement has been advocated in the diagnosis of tuberculous pleurisy with high sensitivity and specificity [1, 2]. ADA levels higher than 47 IU/L, in lymphocytic pleural effusions are highly suggestive of tuberculous pleurisy [3]. However, it should be kept in mind that there are other diseases could cause high ADA levels in the pleural effusions such as rheumatoid pleurisy, empyema, lymphoma and malignant mesothelioma [4].

There are previous case reports suggesting the benefit of ADA measurement in other fluids such as pericardial and peritoneal effusions [5, 6]. The cut off levels of ADA >40 IU/L and 36 to 40 IU/L are used for the diagnoses of tuberculous pericarditis and peritonitis, respectively [5, 6]. However, we are not
aware of a previous report suggesting the ADA measurement in the drained content of cold abscess formation. In this case report we aimed to highlight the potential role of ADA measurement in different materials other than effusions in the diagnosis of TB. This is the first report suggesting the benefit of ADA measurement in the cold abscess content in a case of TB pleurisy.

CASE REPORT

A 34-year-old non-smoking woman attended to our clinic with complaints of left sided chest pain and cough with sputum for the last four months. Her medical and family histories were unremarkable. Her physical examination revealed normal body temperature (36°C), heart rate of 80 beats per minute, respiratory rate of 20 breaths per minute, blood pressure of 110/80 mm Hg, and SpO2 of 93% in room air. Physical examination of the chest revealed diminished movement of the left hemithorax and dullness over the left lung base along with diminished lung sounds in the left lower zone.

The patient claimed 20 kg weight loss over four months. Her initial blood analyses were as follows: WBC 8940/μL (78.7% granulocytes, 8.1% lymphocytes, 12.5% monocytes, 0.7% eosinophils); Hb 10 gm/dL; Hct 33%; platelets, 580,000/μL, ESR 50 mm/1st hour and serum CRP 125 mg/L. Her blood chemistry were as follows: glucose 96 mg/dL, urea 140 mg/L, creatinine 3 mg/L, protein 4.8 g/dL, albumin 2.5 g/dL. Chest X-ray at admission was compatible with pleural effusion occupying almost 30% of the left hemi-thorax. The patient was hospitalized for the further evaluation. About 20 mL of serofibrinous pleural fluid was obtained by thoracentesis from the left side under local anesthesia and ultrasonographic guidance. Biochemical analysis of the pleural fluid revealed an exudative pleural effusion with LDH 325 U/L (normal range: 240-480 U/L), glucose 100 mg/dL, total protein 5.4 g/dL and albumin 2.8 g/dL. Pleural fluid pH was 7.4. Some of the pleural fluid was sent to the laboratory for the measurement of ADA levels. ADA measurements were done by Giuisti’s colorimetric method [7].

The initial differential diagnoses were tuberculous pleurisy, parapneumonic effusion and malignant pleural effusion. After hospitalization of the patient, non-specific antibiotic therapy (ampicillin sulbactam 4x1 gram, daily) was started. Fiberoptic broncoscopy under local anesthesia was unidiagnostic. Tuberculin skin test was 27 mm. Closed pleural biopsy with Abrahm’s needle yielded fibrotic tissue. The cytology of the pleural fluid revealed lymphocyte predominant fluid. Patient’s complaints were reduced after nonspecific antibiotic therapy and thus the patient discharged from hospital to be seen again in two weeks. Pleural fluid was observed to be regressed on the chest X-ray obtained two weeks following her hospital discharge. Repeated thoracentesis revealed lymphocyte predominant exudative effusion with benign cytology. No further test was done and another control visit was planned without any treatment in three months. On her control visit after three months, she complained of an itchy and reddish mass-like lesion on the lower left site of her thorax where the first thoracentesis was done. The diameter of the mass was about 5 cm. Her clinic and thoracic CT findings were consistent with cold abscess due to TB (Figure 1). The patient underwent an open lung surgery. Partial rib resection was performed and drainage of the pus from the capsulated cold abscess was sent for ADA measurement during the operation. ADA activity of drained material was 281U/L while it was 32 U/L in the pleural fluid that was sampled at first admission. Histopathologic evaluation of the resected soft tissue and rib showed caseous granulomatous inflammation.

The patient was diagnosed as tuberculous pleurisy and cold abscess and the antituberculous treatment was started. Recently, the patient was seen two months following tuberculous treatment and her pleural effusion and clinical condition were significantly improved.

DISCUSSION

To the best of our knowledge this is the first reported case of high ADA activity measured in the drained material of a cold abscess that developed following thoracentesis in a case of tuberculous pleurisy.
The primary diagnostic tests in tuberculous pleural effusion are sampling of the pleural fluid and pleural tissue. Some large series suggest that ADA is 100% sensitive and 95-97% specific when a value above 45-60 U/L is found [8, 9]. However, one report found levels above 43 U/L in only 68 of 87 cases (78% sensitivity) [10], while other series found specificities in the range of 85-89% [11, 12]. Tuberculous pleural effusions are not always easy to diagnose but the presence of a lymphocyte-rich exudate associated with an increased ADA level and a positive skin test result is highly suggestive of TB pleurisy.

In the presented case tuberculous pleurisy was on top of the differential diagnosis, because the patient was a young woman with pulmonary complaints and significant weight loss over the last four months in addition to fact that prevalence of TB is relatively high in Turkey. Although the pleural fluid was exudative and lymphocyte predominant, ADA activity in the pleural fluid was 32 U/L. Additionally, microbiological work-up and pleural biopsy revealed no positive results for TB. Due to clinical and radiological improvement following nonspecific antibiotic therapy, the patient was discharged from the hospital to be seen after two weeks. It has been reported that one third of the tuberculous pleural effusions can regress without antitubercular therapy [1]. In the control visit performed two weeks following hospital discharge of the presented case, a radiological regression was noticed. Repeated thoracenthesis revealed similar results as the previous work-up of the pleural effusion. Therefore, the patient was sent without treatment for another control visit in three months. At her control visit after three months the patient was diagnosed to have a cold abscess on the site of previous thoracentesis.

Tuberculous cold abscesses of the chest wall are not frequently encountered and reportedly represent less than 10% of all musculoskeletal tuberculosis cases [13, 14]. The presentation of cold abscesses is a progressively enlarging mass with or without destruction of the underlying bone or cartilage. There are three mechanisms in the pathogenesis of rib tuberculosis; direct extension from pleural or pulmonary parenchymal disease, hematogenous dissemination of a dormant tuberculosis focus or direct extension from lymphadenitis of the chest wall [15]. In the presented case, the cold abscess occurred very close to the site of a previous thoracentesis. Interestingly, ADA level was found to be 281 U/L in the drained pus obtained from the cold abscess where it was 32 U/L in pleural fluid.

**CONCLUSION**

In conclusion, this case has demonstrated that ADA activity might be high in the pus formations infected with mycobacterium tuberculosis as in other body fluids. We recommend that ADA should be studied in any fluid or debris in cases where TB is suspected.

**Author Contributions**
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Ersin Arslan – Conception and design, Acquisition of data, Analysis and interpretation of data, Critical revision of the article, Final approval of the version to be published
Feridun İşik – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published
Öner Dikensoy – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

**Guarantor**
The corresponding author is the guarantor of submission.

**Conflict of Interest**
Authors declare no conflict of interest.

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**REFERENCES**