

Epithelioid Cell Granuloma in Tubercular Pleural Effusion

Kafil Akhtar, Rana K Sherwani and Prasenjit Sen Ray
Department of Pathology, Jawaharlal Nehru Medical College, Aligarh Muslim
University, Aligarh (U.P.), India

Abstract: The present study was undertaken to study the role of fine needle aspiration cytology of pleural effusions in the diagnosis of pulmonary tuberculosis with an attempt to diagnose tubercular infections. Amongst a total of 370 cases with pleural effusions evaluated, there were 200 cases of Tubercular Pleural Effusion (TPE). Majority of the tubercular cases, 80 (40%) were found in 31-40 years age group, with a mean age of 41 years. Sputum positivity for AFB in TPE was found in 55 cases (27.5%), with the bacilli appearing as red colored tiny rods in a greenish background. The cytological findings observed were moderate to high cellularity with predominance of lymphocytes in 120 cases (60.0%), with all lymphocytic cells being enlarged with slight indentation of their nuclei and splintering of nuclear chromatin. Scanty mesothelial cells in 140 (70.0%) cases and a proteinaceous background in 60 (30.0%) cases were the other associated findings. Pleural fluid smear in 13 cases (3.5%) showed acid fast bacilli positivity while culture of pleural fluid was positive for acid fast bacilli in 101 (27.3%) cases.

Key words: Cytology, epithelioid cells, pleural fluid, tuberculosis

INTRODUCTION

Cytology is an etiological enlightenment of a manifest morbid state. The pioneering works of Papanicolaou (1949) was a tremendous leap in the usefulness of cytological interpretations. There is a trend for replacement of histologic diagnosis by cell sampling techniques. The usual method to investigate effusions is cytologic examination of fluid and biopsy of the lining epithelium against a clinical, chemical, bacteriologic and immunologic background (<http://www.ncbi.nlm.nih.gov/pubmed?term=%22Richter%20C%22%5D>: Richter *et al.*, 1994). None of these techniques is diagnostic in it self, hence a correlation between the different diagnostic modalities is important to correctly identify the lesion. Newer diagnostic techniques like lysozyme or interferon gamma estimation, immunodiagnostic methods, polymerase chain reaction and electron microscopy may simplify the diagnosis. (Aggarwal *et al.*, 1999) But the importance of light microscopy against a clinical background is still the most effective tool and remains a major diagnostic procedure.

Salazar *et al.* (1997) have reported that, it is often difficult to diagnose tuberculous pleural effusion because the search for Mycobacterium tuberculosis in fluid, or the identification of historical alterations in the pleural biopsy are often false negative. The diagnosis, however, must be

timely since 43-65% of patients may develop an active pulmonary TB in the next 3-5 years. (Salazar *et al.*, 1997).

Ferrer-Sancho (1996), has stated that diagnosis can be made in a majority of patients from the clinical features, pleural fluid examination (including cytology, biochemistry and bacteriology), and pleural biopsy.

Cytology of pleural effusion showing predominance of lymphocytes with splintered nuclear chromatin, absence or scarcity of mesothelial cells, and presence of epithelioid cells is highly suggestive of tubercular pleural effusion. An attempt has been made in the present study to diagnose tubercular infection in pleural fluids.

MATERIALS AND METHODS

The clinicopathological study of pleural effusions was carried out on the patients attending the outpatient and inpatient departments of Surgery and Pathology of Jawaharlal Nehru Medical College, AMU, Aligarh during the year 2010-2011.

After a detailed clinical history and a thorough examination; pleural fluid was aspirated, cyto-centrifuged and buttonhole smears were prepared and stained with Haematoxylin and Eosin, Papanicolaou and May Grunwald-Giemsa stains.

The following investigations were done in order to reach at a diagnosis. Complete hemogram, ESR, sputum for Acid Fast Bacilli (AFB), chest X-ray, mantoux test

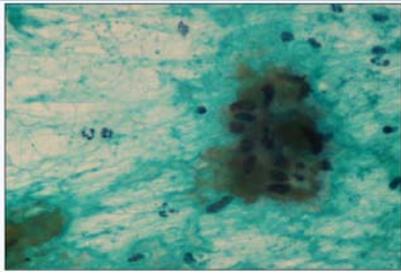


Fig. 1: Pleural fluid smear shows clusters of epithelioid cells in a proteinaceous fibrinous background. PAP stain x 500

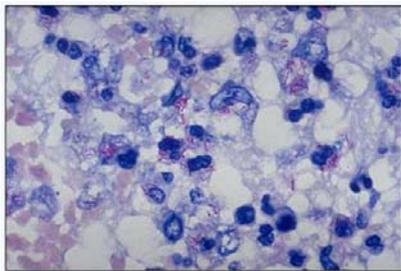


Fig. 2: Pleural fluid smear showed presence of red colored tiny rod shaped bacilli in a bluish green background. Z N stain x 500

and pleural fluid smear and culture for AFB. But the major thrust was on the pleural fluid cytological investigation in the determination of cases with epithelioid cell granulomas.

Observations: The present study was undertaken to study the role of FNA cytology of pleural effusions in the diagnosis of pulmonary tuberculosis.

A total of 370 cases with pleural effusions were evaluated over a period of one year. The associated findings were cough with expectoration in 151 cases (40.8%), followed by fever in 138 cases (37.3%), dyspnoea in 130 cases (35.1%) and chest pain in 105 cases (28.4%).

Among 370 cases, there were 200 cases of Tubercular Pleural Effusion (TPE), among which 170 (85.0%) were unilateral and 30 (15.0%) were bilateral. Majority of the tubercular cases were found in 31-40 years age group, 80 (40.0%) cases with a mean age of 41 years and least number of cases were found in 0-10 years age group, 10 (5.0%).

Sputum positivity for AFB in TPE was found in 55 cases (27.5%), with the bacilli appearing as red colored tiny rods in a greenish background. Thickened pleura with calcifications, encysted pleural effusion and parenchymal lung infiltrates were the main radiological findings. Mantoux test positivity (reaction > 10 mm) present in 180 (90.0%) cases.

The cytological findings observed in TPE were as follows: Moderate to high cellularity with predominance of lymphocytes in 120 cases (60.0%), with all lymphocytic cells being enlarged with slight indentation of their nuclei and splintering of nuclear chromatin. Scanty mesothelial cells in 140 (70.0%) cases and a proteinaceous background in 60 (30.0%) cases were the other associated findings. Epithelioid cells/activated macrophages were present in 14 (7.0%) cases (Fig. 1).

Pleural fluid smear was studied for AFB and only 13 cases (3.5%) showed presence of red colored tiny rod shaped bacilli in a bluish green background. Culture of pleural fluid was positive for acid fast bacilli in 101 (27.3%) cases, showing buff colored, slow growing colonies or cauliflower like growth.

DISCUSSION

Cytologic study of body effusions is in fact a complete diagnostic modality which aims at pointing out the etiology of effusion as well as in certain cases a means of prognostications of the disease process.

In the present study 370 patients with pleural effusion were evaluated over a period of one year; among which 200 patients had Tubercular Pleural Effusion (TPE) - confirmed by various methods - sputum positivity for AFB, pleural fluid smear and culture positivity for AFB, pleural biopsy and response to anti tubercular treatment.

The average age of TPE cases was 41 years, the increased incidence of TPE in 31-40 years age group can be attributed to the fact, that with the changing epidemiology - TPE is becoming more common in adults with post primary or reactivation tuberculosis. Similar findings were observed by Moudgil *et al.* (1994) and Seibert *et al.* (1999).

170 (85.0%) cases had unilateral pleural effusion and 30 (15.0%) had bilateral disease which coincides with the statement by Merino *et al.* (1999) that TPE is mostly unilateral and rarely bilateral. Pleural fluid smear for AFB was positive in 13 cases (3.5%) and culture for tubercle bacilli was positive in 101 (27.3%) cases in our study but Richter *et al.* (1994) reported AFB positivity by Ziehl-Neelsen stain in 71.3% cases and culture in 36.0% of their cases. Similar studies by Salazar *et al.* (1997), have showed 8.0% smears positive for AFB and mycobacterium positive culture in 19% cases and Tubercular Pleural Effusion (TPE) was confirmed in 54 patients out of a total of 121 cases. Zarić *et al.* (2008) have emphasized on the criteria used for TPE diagnosis as positive cultures of effusion or biopsy specimen, tuberculous granulomas, or positive sputum cultures without other explanation for pleural effusion.

Spieler (1979) demonstrated the cytological features of a typical TPE showing moderate to high cellularity smears with predominance of lymphocytes having round or slightly indented nuclei with splintered nuclear chromatin. All of these features were noted in our patients

with diagnosed TPE. Scarcity of mesothelial cells in TPE smears in our study was similar to as reported by Springgs and Bodington (1960) who stated that these cells are usually scanty or absent in florid TPE.

A very characteristic proteinaceous “lacy background” was found in smears of 60 (30.0%) TPE cases in present study. Though the presence of such lacy background in TPE is not mentioned in earlier literatures - our experience suggests that when present, it is pathognomonic of Tubercular Pleural Effusion (TPE), which is accounted by the presence of proteinaceous fibrinous material in pleural fluids. Epithelioid cells/activated macrophages were found in 14 (7.0%) cases and caseous/granular necrosis in 73 (19.7%) cases of pleural effusion.

CONCLUSION

Pleural effusion is a common finding in pulmonary tuberculosis. Tuberculosis remains a serious contagious infection that requires proper infection control measures and cytology of pleural effusion showing predominance of lymphocytes with splintered nuclear chromatin, absence or scarcity of mesothelial cells, and presence of epithelioid cells is highly suggestive of tubercular pleural effusion.

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