Management of Tuberculous Pleural Effusion

Beenish Ajmal, Kanza Ijaz ,Khawaja Tahir Mahmood
Department of pharmacy, Lahore College for Women University, Lahore

Abstract
Tuberculous (TB) pleural infusion is a buildup of fluid in the space between the lining of the lung and the lung tissue (pleural space) after a severe, usually long-term infection with tuberculosis. A study was carried out among 20patients of TB pleural effusion, of which 3 could be followed for a period of 3months. The aims of the study were to assess the patient compliance with the management methods for tuberculous pleural effusion, the end results of treatment of pleural effusion with anti-TB drugs and aspiration methods, the relapse rate over a 3 months period, patient satisfaction with DOTS medicines as well as aspiration therapy, to prevent the subsequent development of active tuberculosis & to relieve symptoms. The methods employed to accomplish these aims were development of a medication history/patient interview form. Patients with tuberculous pleural effusion were interviewed & national treatment guidelines were compared with international treatment guidelines. The results revealed that 90% were satisfied with the DOTS policy, with respect to management of tuberculous pleural effusion, at the end of treatment whereas 10% expressed dissatisfaction with this policy.

Key words: Aspiration, DOTS, Management, Tuberculous Pleural Effusion

INTRODUCTION

Tuberculous (TB) pleural infusion is a buildup of fluid in the space between the lining of the lung and the lung tissue (pleural space) after a severe, usually long-term infection with tuberculosis [1]

Tuberculous pleural effusion is one of the most common forms of extra pulmonary tuberculosis (TB). The immediate cause of the effusion is a delayed hypersensitivity response to mycobacterium antigens in the pleural space. For this reason microbiological analyses are often negative and limited by the lengthy delay in obtaining results [2]

The clinical importance of pleural effusions ranges from incidental manifestations of cardiopulmonary diseases to symptomatic inflammatory or malignant diseases, as shown in the image below, requiring urgent evaluation and treatment [3] Treatment of tuberculous pleural effusion will always involve a combination of many drugs (usually four drugs). The medicines are continued until lab tests show which medicines work best. The outlook is excellent if tuberculous pleural effusion is diagnosed early and treatment is begun quickly. Tuberculous pleural effusion can cause permanent lung damage if not treated early.

The highest diagnostic yield was obtained by histology (85%), followed by culture of pleural biopsy (37%) and pleural fluid culture (36%) [4] Closed pleural biopsy remains the most effective diagnostic method, and ADA level is a cheap diagnostic method in countries with a high prevalence of TB [5] There is no doubt that pleuroscopy-guided biopsy is of great value for TPE diagnosis; however, sensitivity and specificity of noninvasive tests, especially ADA, can help to distinguish between TB and malignancy [6] The investigation of pleural effusion has been greatly assisted by advancements in pleural fluid analysis. In the case of tuberculous pleural effusion, diagnosis traditionally requires the demonstration of acid fast bacilli in the pleural space using microbiological or histological techniques. [7]

Pleural effusion accounts for 22.1% of cases of pediatric pulmonary tuberculosis. Parenchymal consolidation is the most common associated radiographic finding. Bacteriologic confirmation was achieved in 56.4% of cases. A short course of chemotherapy is effective [8]

If the patient has a transudative effusion, therapy should be directed toward the underlying heart failure or cirrhosis. If the patient has an exudative effusion, attempts should be made to define the etiology. Pneumonia, cancer, tuberculosis, and pulmonary embolism account for most exudative effusions [9] Transudative effusions are usually managed by treating the underlying medical disorder. However, whether transudates or exudates, refractory large pleural effusions causing severe respiratory symptoms, even if the cause is understood and disease-specific treatment is available, can be drained to provide relief. The management of exudative effusions depends on the underlying etiology of the effusion [10]

The management depend on the performance status of the patient, severity of the symptoms. Currently, the standard short-course chemotherapy for tuberculosis comprises a six-month regimen, with a 4-drug intensive phase and 2-drug continuation phase [11] Out-patient chest tube drainage is effective for the management of both malignant and suppurative pleural Effusion. This approach would reduce the ever increasing cost of hospital care for this group of patients [12].

METHODS

Study was carried out at Gulab Devi Chest Hospital, Lahore. 20 patients of any age were randomly selected, of which 3 could be followed for a period of 3months. Thorough history taking and physical examinations, radiological findings, hematological and serum biochemical profiles were recorded. Pleural aspiration and biopsy were also performed. Each sample of pleural tissue was cultured for mycobacterium and the rest was sent for histological examination. Macroscopic findings, cytological, microbiological and biochemical analysis of pleural fluid were analyzed. Patients with tuberculous pleural effusion were interviewed and case histories were taken on a predesigned Performa and significant and relevant points were noted such as age, sex, duration of hospitalization, causes, clinical diagnosis and treatment. National treatment guidelines were compared with international treatment guidelines.

Inclusion criteria

- 20patients of either sex i.e. both male and females randomly selected
- Patients of all ages were included

Exclusion criteria

- Renal insufficiency and/or liver insufficiency: Patients may present faulty high values
  Of pleural fluid Adenosine deaminase level
- Multiple pathology of pleural effusion: Patients with more than one etiology of pleural effusion.
- Patient's refusal
- Neonates were excluded from the study

RESULTS

Data of 20 patients with tuberculous pleural effusion was studied in a specialized hospital setting. The following parameters were analyzed during the study:

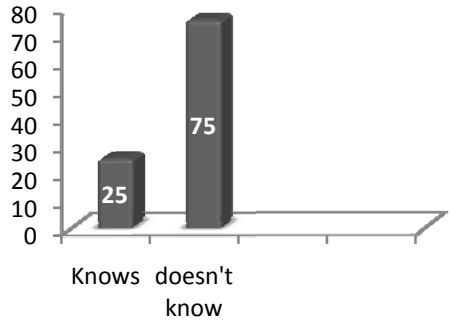

Fig 1: AWARENESS ABOUT TUBERCULOUS PLEURAL EFFUSION

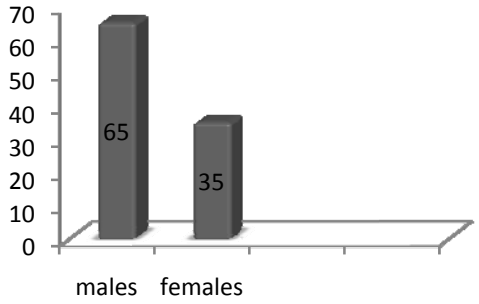

Fig 2: PREVELANCE OF TUBERCULOUS PLEURAL EFFUSION

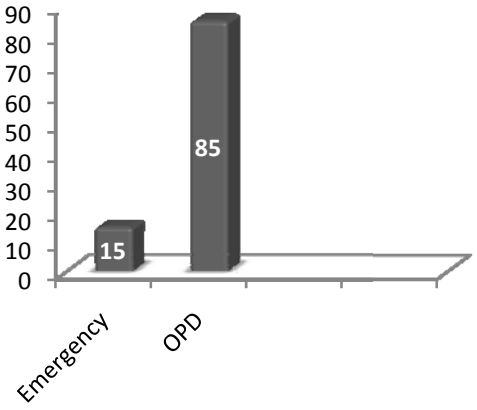

Fig 3: HOSPITAL ADDMISSION CHANNEL

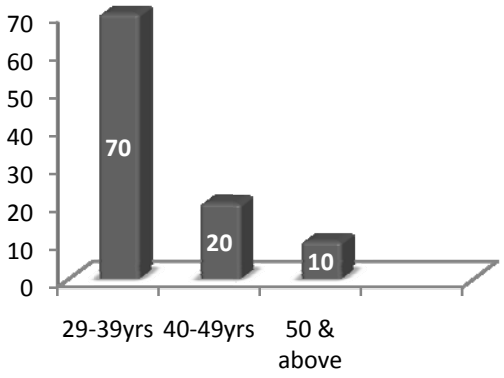

Fig 4: COMPARISON OF AGE WITH PREVELANCE OF TUBERCULOUS PLEURAL EFFUSION

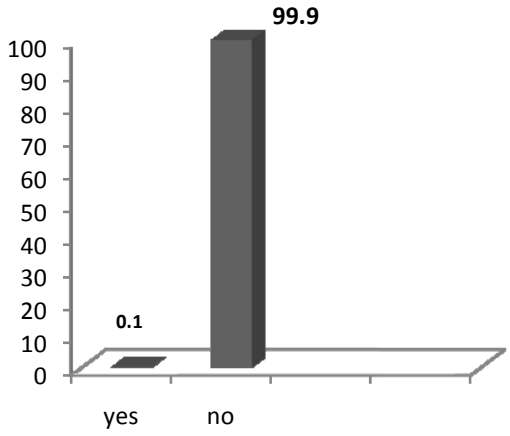

Fig 5: MORTALITY

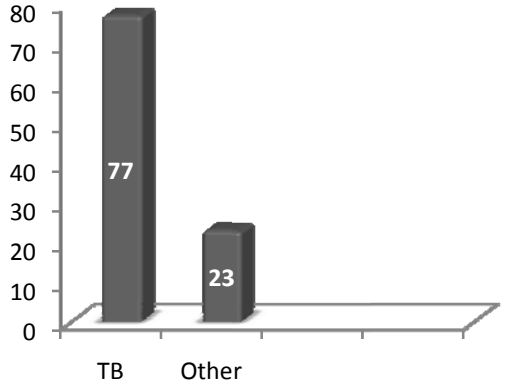

Fig 6: MOST COMMON CAUSE OF PLEURAL EFFUSION IN PAKISTAN

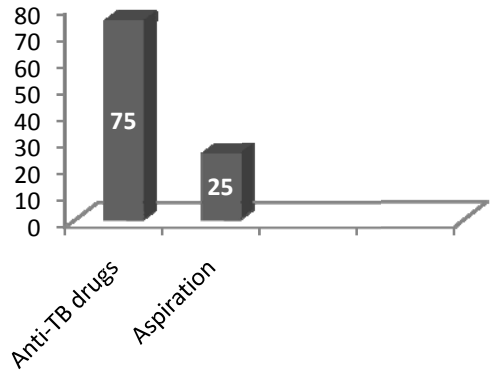

Fig 7: PRESCRIBING TREATMENT FOR TPE PATIENTS

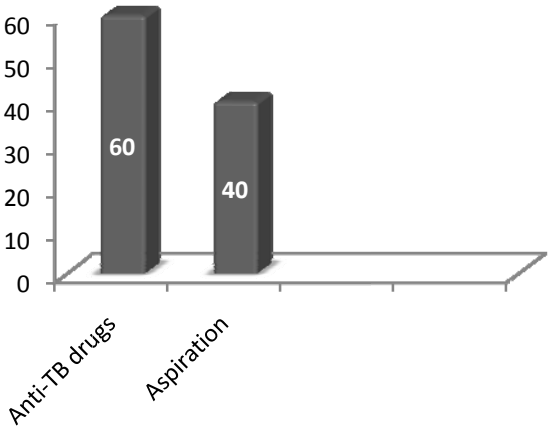

Fig 8: PATIENT COMPLIANCE WITH PRESCRIBING TREATMENT

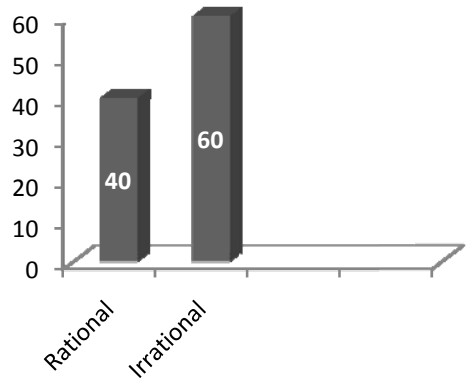

Fig 9: RATIONAL vs. IRRATIONAL PRESCRIBING TREATMENT IN ACCORDANCE WITH CRITERIA GIVEN IN STANDARD TREATMENT GUIDELINES

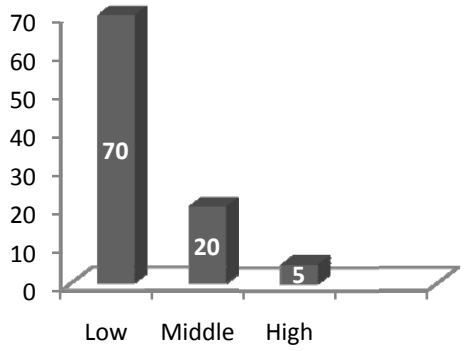

Fig 10: PREVELANCE OF TPE IN ACCORDANCE WITH ECONOMIC STATUS

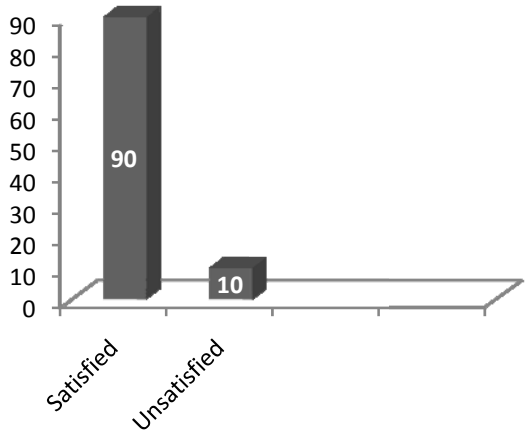

Fig 11: SATISFACTION FROM TREATMENT WITH DOTS MEDICINES

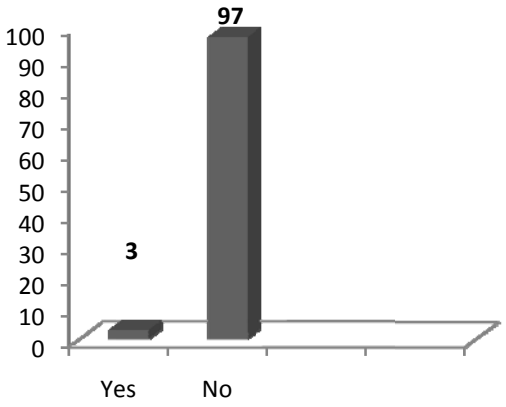

Fig 12: RELAPSE

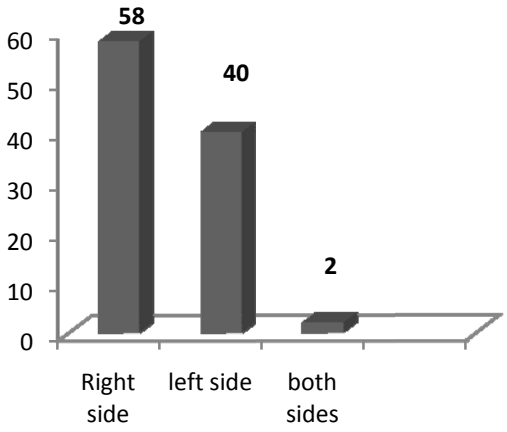

Fig 13: SIDE OF CHEST INVOLVED IN PATIENTS WITH TB PLEURAL EFFUSION

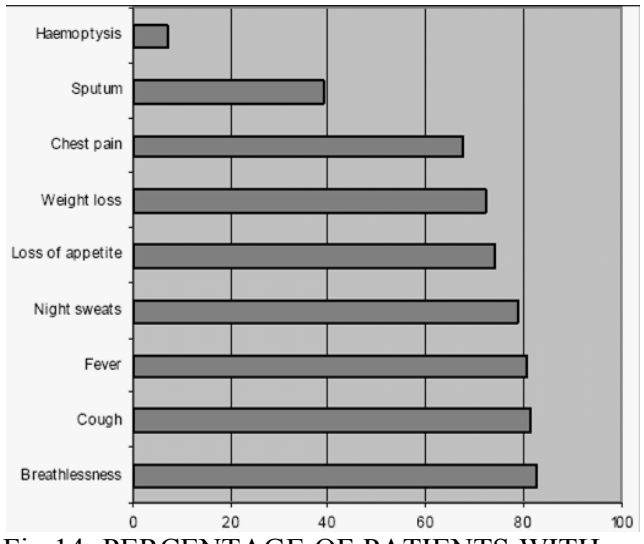

Fig 14: PERCENTAGE OF PATIENTS WITH VARIOUS SYMPTOMS

DISCUSSION

Common presentation of tuberculous pleural effusion were fever, breathlessness, cough, night sweat, loss of appetite, weight loss and chest pain. Cough was mainly unproductive. Haemoptysis was rare. Generally clinical symptoms and physical signs do not positively help for definitive diagnosis of TPE [13]

Diagnostic pleural aspiration and pleural biopsy could be performed by a single session of procedure. Results of cytological and microbiological examination as well as pleural biopsy could be obtained within 3 to 5 days. The procedure needed to be repeated in patients with non informative pleural fluid and pleural biopsy examinations.

The natural history of an untreated tuberculous pleural effusion is characterized by spontaneous resolution in 4 to 16 weeks with subsequent development of active pulmonary TB in 43 to 65% of cases. These data emphasize the importance of proper diagnosis and treatment of tuberculous pleural effusions.

According to the directly observed treatment short-course guidelines, severely ill patients with extensive or bilateral pleural effusions and sputum positivity are given treatment under category I (treated during intensive phase with four drugs: isoniazid, rifampin, pyrazinamide, and ethambutol for 2 months followed by continuation phase of 4 months with isoniazid and rifampin).[14] Those with a solitary TB pleural effusion should be treated with isoniazid, rifampin, and pyrazinamide for 2 months followed by 4 months of two drugs, isoniazid and rifampin. Especially in loculated TB pleural effusions, there can be delayed resorption of pleural fluid even after completion of 6 months of treatment [15]

Under the Revised National Tuberculosis Control Programme, patients who are sputum negative after 3 smear examinations are subjected to radiological examination after they fail to respond to a course of antibiotics for a period of two weeks. Those showing radiological evidence of pleural effusion are examined physically and investigated further by tuberculin testing and diagnostic aspiration. Those confirmed to be suffering from tuberculous pleural effusion by naked eye examination; biochemical tests and cytology of pleural fluid are given a fixed schedule of drugs. The treatment is stopped after six or eight months as per category, and outcome is reported as “Treatment Completed” [16].

CONCLUSION

Involvement of pleural surfaces in patients with tuberculosis is still one of the most common extra-pulmonary manifestations of thoracic tuberculosis. Six months intermittent regimens are now considered standard and effective therapy in most parts of the world. Failure to improve with antituberculous therapy may be due to concurrent mixed infection with anaerobic bacteria. Steroids accelerate the resolution of symptoms and reabsorption of fluid. Isoniazid, Ethambutol, Rifampicin, Pyrizamide and Streptomycin for six months were reported to be the course of management. However in pregnancy Streptomycin was strongly contraindicated. A relapse rate of 3% after 3 months of follow up was noted. The patients of pleural effusion who are treated under DOTS often fail to get convinced about the successful results of treatment and question the treating physician about the basis of his assessment for stopping treatment.

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