ORIGINAL ARTICLE

# Clinical Spectrum of Pulmonary and Extrapulmonary Tuberculosis in End Stage Renal Disease in Jammu

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**Abstract**

One hundred patients of End Stage Renal Disease (ESRD) (mean age 50.5 years, S.D. 14.0341) during a period of one year from April 1, 2004 to March 31, 2005 were studied. Detailed clinical history, physical examination and laboratory investigations were recorded. Chi-square and Fischer-exact tests were used for statistical analysis. Sixteen cases of tuberculosis were detected in 100 ESRD patients. Fifteen of them were pulmonary and one extrapulmonary. Increased association of tuberculosis was seen in – diabetics as underlying cause for ESRD (37.5%), lower socioeconomic status (62%), male patients (68.75%), and patients > 35 years of age (87.5%). Anorexia was most common symptom (100%), followed by fever (87.5%) and cough (68.7%). Keeping in view of high incidence and prevalence of tuberculosis, patients of ESRD should always be screened for tuberculosis, requiring a high index of suspicion.

***Key words***

End Stage Renal Disease, Tuberculosis – pulmonary, extrapulmonary.

India has almost 30% of the global burden of tuberculosis and one person dies of disease every minute.1 Currently in India there are about 14 million suspected and about 3.5 million bacteriologically proved cases of pulmonary tuberculosis and prevalence of 4.84 / 1000 cases.2 Incidence of tuberculosis is about 1.5 per 1000 population. More recently, average prevalence of all forms of tuberculosis in India estimated to be about 5.05 per 1000.3 Due to certain risk factors like abnormalities of cellular immunity, disturbance of skin and mucous membrane barrier, inadequate nutrition and acidosis, most patients with ESRD are particularly prone to develop tuberculosis4 and recent reports confirm the greater incidence of tuberculosis associated with ESRD.5

According to experience of different centres, pulmonary involvement of the disease is the most common form in patients of ESRD.4,7,8,9,10 However, extrapulmonary tuberculosis has been reported to be main site of infection in several reports.8,9,11

Some authors noted that international migration, particularly from Asia, have resulted in increased incidence of tuberculosis in ESRD.12

## Materials and Methods

This in-hospital study involved the detection of tuberculosis, both pulmonary as well as extrapulmonary in end stage renal disease patients admitted in the Government Medical College Hospital, Jammu in the Department of Medicine, during a period of one year from 1st April, 2004 to 31st March, 2005.

End stage renal disease (ESRD) from any cause in subjects of either sex and age were selected for the study. Details of clinical history, physical examination and laboratory investigations were recorded in a special proforma.

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Specific symptoms which were looked in each case were – persistent cough of about 3 or 4 weeks duration, continuous fever, chest pain, hemoptysis, swelling in the neck/axilla, anorexia, weight loss and abdominal pain/distension.

Cases had undergone full investigation including full blood pictures, ESR, renal function tests, creatinine clearance by Cockcroft-Gault formula, X-ray chest (PA/lateral view, apicogram), tuberculin skin test (PPD), sputum smears, ELISA for mycobacterium tuberculosis, cytology and biochemistry fluid drawn from serous cavities, FNAC, biopsy of suspected tissues such as lymph nodes, peritoneum, pleura (when indicated), bone radiology, PCR for mycobacterium tuberculosis (if required). Statistical analysis were done using Chi-Square and Fischer-exact tests.

**Results**

Sixteen cases of tuberculosis were seen in 100 patients of ESRD in this study. Three of the cases had history of previous treated tuberculosis, thereby 13 new cases were detected. The incidence/prevalence seen in the present study is strictly not comparable to the general population. The present study being a hospital-based study, prevalence tends to be higher since the sample is not truely representative owing to selection bias.

Mean age of patients was 50.56 years. Majority of patients were male (70%). Majority of ESRD patients were in age group 51-60 years (Table I). Major baseline parameters were deranged. Patients were moderately anemic (mean Hb 7.9 gm%). Creatinine clearance was < 10 (mean 7.1835). PPD (Mx) was positive in a single patient (6.25%). Mean ESR in persons suffering from tuberculosis was 82.93 mm/1st hour.

The main underlying etiology for ESRD was chronic glomerulonephritis (34%), followed by diabetes mellitus (30%) and hypertension (26%) (Table II). Anorexia (100%), fever (87.5%) and cough (68.7%) were the most common symptoms (Table III).

Most of the patients suffering from tuberculosis were older than 35 years (87.5%). Males (68.75%) were more affected by tuberculosis than females.

37.5 per cent of diabetics as underlying cause for ESRD had tuberculosis. More of tuberculosis was seen in patients with lower socio-economic status. Ten of 16 tuberculosis patients belonged to lower socio-economic status.

Sixteen cases of tuberculosis were detected in 100 ESRD patients. Fifteen of them were pulmonary, only one was extrapulmonary.

**DISCUSSION**

The average annual risk of tuberculosis infection is about 1.7 per cent.13 India has almost 30 per cent of the global burden of tuberculosis.1

Along with lymphocyte dysfunction and decrease in absolute lymphocyte counts, furthermore, interferon production is depressed in uremia. In chronic renal failure the functions of polymorphonuclear leuckocytes known as first line of non-specific defense against microbial infection, involving chemotaxis, bactericidal activity have been reported as diminished.14

As per etiology of the patients with end stage renal disease, chronic glomerulonephritis accounted for the largest number of the patients (34%) followed closely by diabetes mellitus (30%), then hypertension (26%), obstructive uropathy (5%) and others (5%).

As for age is concerned, majority of patients were in age group 51 to 60 years, comprising of 23 males (32.85%) and 16 females (53.33%). Mean age was 50.56 years with standard deviation of 14.0341. Majority of the patients were male (70%).

In the present study, we found 16 cases of tuberculosis out of 100 ESRD patients. Out of 16, 15 were pulmonary and 1 was extrapulmonary. Amongst pulmonary, 9 cases were infilterative, 4 cases of pleural effusion and 2 cases of consolidation. Extrapulmonary case included abdominal tuberculosis in form of intra-abdominal lymphedenopathy in which ultrasound guided FNAC revealed granulomatous lesion. IgM for mycobacterium tuberculosis was positive in it. Among pulmonary, 2 of the cases had sputum for AFB positive. In the rest, clini-

cal suspicion, supportive investigations and response to the treatment were the criteria.

Pulmonary form of tuberculosis as main form of tuberculosis was also observed in the studies done by Cengiz *et al.* (1996)5, Shohaib *et al.* (1998)6, Taskapan *et al.* (2000)7, Mohammed Al *et al.* (1997)10, Erkoc *et al.* (2004)15. While extrapulmonary as main form of tuberculosis was observed in several other studies (Andrew *et al.*, 19804; Venkata *et al.*, 20078; Abdelrahman *et al.*, 20069; Malik *et al.*, 200211; Mitwalli *et al.*, 199116).

As far as clinical symptoms amongst tuberculosis patients were concerned, anorexia was the most common symptoms seen in 100 per cent patients, next was fever seen in 87.5 per cent, cough in 68.7 per cent, weight loss in 56.25 per cent, pain chest in 43.7 per cent, hemoptysis in 25 per cent, pain abdomen in 6.25 per cent patients. Thus, anorexia, fever and cough were the most common symptoms. Fever, weight loss, malaise were common symptoms noticed by Venkata *et al.* (2007)8, undiagnosed pyrexia, lethargy, weight loss by Kwan *et al.* (1991)17. Anorexia, loss of weight, low grade fever by Mitwalli *et al.* (1991)16; anorexia, weight loss, fever by Cengiz *et al.* (1996)5; similar symptoms found by Shohaib *et al.* (1998)6, Mohammed Al *et al.* (1997)10 and Malik *et al.* (2002)11.

Age of the patients suffering from tuberculosis varied from 22 to 70 years (mean 48.31 years). Most of the patients of tuberculosis in ESRD were more than 35 years old comprising 14 of 16 patients (87.5%) matching Taskapan *et al.* (2000)7, where age of the patients suffering from tuberculosis varied from 19 to 70 years with mean age 43.05 ± 3.72 years. Mean age in Shohaib *et al.* (1998)6 was 48 years in males and 47 years in female.

In present study, out of 16 patients, 11 patients (68.75%) were male and 5 patients were female. Similarly, Venkata *et al.* (2007)8 and Murthy and Pereira (1997)18 reported more males affected by tuberculosis.

Mean ESR was 33.12 in 100 patients whereas mean ESR was 82.93 in case of patients with tuberculosis with standard deviation of 20.65. ESR was found to be varied in tuberculosis patients of ESRD. Mean PPD (Mx) in 100 patients was 5.97. A recent conversion of positive has more value than an isolated positive PPD test in these situation. In contrast, a positive PPD test can be taken as an diagnostic aid to detect tuberculosis infection, in countries with low prevalence of tuberculosis. However, among dialysis patients, a positive PPD test was observed only in 40 to 60 per cent of patients with tuberculosis.4 The defective cell mediated immunity associated with uremia is the likely cause of low sensitivity of the PPD test in these patients.

Among 16 cases, 2 had sputum for AFB positive, 4 cases had IgM positive for mycobacterium tuberculosis. All the 4 pleural effusion cases had fluid as exudate and lymphocytic predominance.

One of the pleural fluid had positive PCR for mycobacterium tuberculosis. Rest of the cases were unable to afford PCR. Once diagnosed, all the patients were put on short course chemotherapy.

All the patients were on regular follow-up except 2 patients who did not report for follow-up despite reminders. Four patients died during treatment. Cause of mortality was not directly attributed to tuberculosis in any of them. Rest of the patients improved symptomatically and radiologically. The present study conclude that keeping in view of high incidence and prevalence of tuberculosis, patients of ESRD should always be screened for tuberculosis, requiring a high index of suspicion as well as early diagnosis and management for gratifying outcome.

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| Age group (in years) | No. of patients | | Total no. of cases |
|---|---|---|---|
| | Male (%) | Female (%) | |
| 10 – 20 | 2 (2.85) | 1 (3.33) | 3 |
| 21 – 30 | 9 (12.8) | – | 9 |
| 31 – 40 | 13 (18.75) | 3 (10.0) | 16 |
| 41 – 50 | 11 (15.71) | 6 (20.0) | 17 |
| 51 – 60 | 23 (32.85) | 16 (53.33) | 39 |
| 61 – 70 | 8 (11.42) | 4 (13.33) | 12 |
| > 71 | 4 (5.7) | – | 4 |
| **Total** | **70** | **30** | **100** |

| Etiology of ESRD | With tuberculosis | Without tuberculosis | Total |
|---|---|---|---|
| Chronic glomerulonephritis | 7 | 27 | 34 |
| Diabetes mellitus | 6 | 24 | 30 |
| Hypertension | 3 | 23 | 26 |
| Obstructive uropathy | Nil | 5 | 5 |
| Others | Nil | 5 | 5 |

| Symptoms | Positive (n = 16) | Frequency (%) |
|---|---|---|
| Fever | 14 | 87.5 |
| Cough | 11 | 68.7 |
| Anorexia | 16 | 100.0 |
| Pain chest | 7 | 43.7 |
| Hemoptysis | 4 | 25.0 |
| Swelling | Nil | Nil |
| Pain abdomen / Distension | 1 | 6.25 |
| Weight loss | 9 | 56.25 |