

Clinical profile of Tuberculosis in Chronic kidney patients: An experience of a tertiary care hospital in eastern India.

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Introduction

Tuberculosis (TB) is a communicable disease that is a major cause of ill health and one of the leading causes of death worldwide. India is the highest TB burden country in the world having an estimated incidence of 26.9 lakhs in 2019.

Patients with chronic kidney disease are more prone to develop active Tuberculosis owing to various factors. The predominant defect in such cases is immunodeficiency (1). Inflammation, oxidative stress, nutritional deficiencies including vitamin D deficiency play a role as well. To add to these immune cells like B cells, T cells, neutrophils, monocytes, and NK cells also have defective function thus resulting in inability to counter *Mycobacterium tuberculosis*. Very often CKD patients also have coexistent conditions like Diabetes, HIV, renal transplant. Profound immunodeficiency can start in stage 3 CKD thereby worsening further in later stages (2). Active TB may be acquired after new exposure or reactivation from previous exposure. Diagnosis of TB in CKD patients is not easy as disease presentation is quite different from non-CKD patients owing to immunodeficiency. The treatment is equally challenging due to drug interactions and deranged pharmacokinetics (3,4).

This study aimed to study the spectrum of Tuberculosis occurring in CKD patients attending our Hospital.

Material and methods:

This prospective observational study was carried out in the OPD and IPD of department of Pulmonary medicine from February 2019 to March 2020. It included 100 patients with CKD who also had TB. Detailed clinical history of patients with CKD and proven TB was recorded.

Diagnosis of TB was based on positive direct microscopy or culture of any specimen or a tissue for *M. tuberculosis* and (b) histopathological evidence of *M. tuberculosis* (granulomatous with caseating necrosis). For pleural TB diagnosis, laboratory findings of pleural fluid analysis reports along with clinical history was taken into account.

Statistical analysis:

Data was analyzed using SPSS v20. A p value <0.05 was considered to be statistically significant.

RESULTS

A total of 100 CKD patients with tuberculosis was included in the study period. Mean age of patients were 52.88 years. Sixty eight patients were male and 32 were female. 50% patients had diabetes and 38% had hypertension. Among 100 patients four patients had HIV and 10 patients had immunosuppression. 23% patients had CKD stage1-3, 60% patients stage 4 and rest 17% patients had stage 5 CKD.(table 2)

Table 1. Demographic profile of patients

	% of patients
Male	68
Female	32
Age in years (mean)	52.88
Diabetes	50
Hypertension	38
HIV	4
Immunosuppression	10

Table 2. Stage of CKD in TB patients

Stage	No of patients
2	1
3	22
4	60
5	17
Total	100

The most common site of tuberculosis in CKD patients was lungs(34%) followed by disseminated TB in 21% patients.(table 3)

Table 3. Site of Tuberculosis in patients with CKD

Name of site	No of patients(%)
Pulmonary	34(34)
Disseminated	21(21)
Pleural	14(14)
Lymph node	8(8)
Abdominal	6(6)
CNS	5(5)
Spine	4(4)
Breast	2(2)
Sternum	2(2)
Fibula	1(1)
Genitourinary	1(1)
Renal	1(1)
Wrist bone	1(1)
Total	100(100)

The most common clinical feature of tuberculosis were weight loss(63%), cough(61%), fever (56%). 50% of patients presented with shortness of breath(table 4).

Table 4. Clinical manifestation of Tuberculosis

Clinical features	%
Fever	56
Cough	61
Haemoptysis	14
Weight loss	63
Shortness of breath	52
Chest pain	8

Hematuria	1
Pain abdomen	7
Altered sensorium	20
Breast swelling	2

Eighty eight patients had developed TB for the first time and 11 patients had received antitubercular drugs previously (table 5). Out of 100 patients 14% patient were on regular haemodialysis and 86% patients were not on dialysis. (Table 6)

Table 5. Type of TB case

Type	No of patients
New case	88
Retreatment case	11
Default	1
total	100

Table 6. Distribution of cases in respect of treatment

	New	Retreatment	Treatment after default	Total patients
Patient on haemodialysis	11	3	0	14
Patients on medical treatment	77	8	1	86

The common chest x-ray picture were pleural effusion, consolidation and cavity (Table 7). CT scan was done 27 patients. The commonly seen CT pattern were tree in bud, consolidation and cavity. (table 8)

Table 7. Chest x-ray pattern

	% of patients
Consolidation	24
Cavity	23
Mass	3
Miliary	7
Collapse	3
Pleural effusion	29
Abscess	1

Table 8. CT Scan patterns in 27 patients

Cavity	9
Abscess	1
Mass	2
Miliary nodule	5
Consolidation	13
Collapse	5
Tree in bud	15
Pleural effusion	6

Discussion

The prevalence of chronic kidney disease is increasing world wide and estimated to be 9.1%.(5)In western countries, diabetes and hypertension are risk factor in 2/3rd of the cases of CKD. In India prevalence of diabetes and hypertension are increasing so also incidence of chronic kidney disease.(7)

The relationship between CKD and TB is not clear.A systematic review and meta-analysis on the risk of active tuberculosis in chronic kidney disease was published in 2015.This study found consistent evidence of an increased risk of active TB in ESRD compared to the general population.

A study of tuberculosis in 36 patients with chronic kidney disease: fever, malaise and weight loss were found to be the commonest symptoms.(8) Extrapulmonary tuberculosis (23 patients, 63.8%) predominated over pulmonary tuberculosis (10 patients, 36.1%).

Another retrospective study of 115 TB cases in CKD patients from India found pleuropulmonary (41.8%), kidney and urinary tract (20%), and abdomen and lymph node (13% each) to be common sites for TB in CKD patients.⁽⁹⁾ The common clinical features of TB was: fever/pyrexia of unknown origin in 24.3%, constitutional symptoms of anorexia, fever, night sweats, and weight loss in 27.8%, abnormal chest radiograph in 31.2%, ascites/peritonitis in 13.9%, pleural effusion in 25.2%, lymphadenopathy in 20%, and sterile pyuria/hematuria/chronic pyelonephritis in 13%. The incidence of TB was high among CKD stages 4 and 5 and in those receiving dialysis.

In our study we found cough, weight loss, fever and shortness of breath were common presenting symptoms. 66% patients had extrapulmonary TB and 34% patients had pulmonary TB. Most of patient with TB were in stage 4 of CKD. In our study 88% patients were new cases. In chest x-ray, pleural effusion, consolidation and cavity were common findings. Among patients who were subjected to CT scan, consolidation, tree in bud and cavity findings were common.

In conclusion, extrapulmonary TB were more common than pulmonary TB in CKD patients. Weight loss, fever and cough were the predominant presenting symptoms of tuberculosis in CKD patients. CKD patients with these symptoms should be evaluated extensively to rule out TB.

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