

Original Article

Prevalence of renal tuberculosis among patients presenting with active pulmonary tuberculosis in Ilorin - Nigeria

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Abstract: Tuberculosis (TB) is a major health problem world-wide, especially in tropical developing countries involving major organs in the body. The kidney is usually affected through haematogenous spread from a primary focus. Renal tuberculosis is the commonest form of extra pulmonary TB particularly among the Caucasians but thought to be rare in Blacks. Due to the paucity of data on the prevalence of renal TB. A prospective study was undertaken to investigate the prevalence of renal TB in cases of active pulmonary TB (PTB) in Ilorin - Nigeria.

Confirmed cases of active PTB patients were consecutively recruited from the Pulmonary Clinic and the PTB Ward over a one year period. The inclusion criteria were sputum acid fast bacilli (AFB) positivity on two or more occasions and radiological evidence of PTB. Patients fulfilling the above criteria were investigated by urine analysis for sterile acid pyuria, Z-N stain, plain abdominal x-rays, renal ultrasound, intravenous urogram and renal biopsy.

A total of 148 active PTB patients were studied (91 males, 57 females). Male to female ratio was 3:2.

The mean age of the males and females with renal TB was 40 and 29 years respectively.

The prevalence rates of AFB in urine and sterile acid pyuria were 9.5% and 8.8% respectively. Only 2.7% had both AFB in urine and sterile pyuria.

Renal histology was abnormal in 70% of the biopsied kidneys with sterile pyuria. The combination of AFB in urine and histologic evidence of renal TB increased the prevalence of renal TB to 14% in the study.

The study shows that renal TB in active PTB may be similar in Black and White populations. The diagnosis is difficult and a high index of clinical suspicion with combined diagnostic tools are required to identify the lesion.

Key words: pulmonary TB, renal tuberculosis, sterile pyuria, tuberculosis of the kidney, urinary tuberculosis,

Introduction

Tuberculosis is an infective granulomatous disease caused by many species of mycobacteria, the commonest of which is mycobacterium tuberculosis. Pulmonary disease accounts for about 60% of cases while 40% are extrapulmonary [1].

Pulmonary tuberculosis (PTB) is a major health problem World-wide, especially in tropical developing Countries where the disease is endemic [2,3,4]. The World Health Organization (WHO) reports showed that there are about 15-20 million cases of tuberculosis annually with more than three million yearly deaths [5].

Renal involvement in tuberculosis occurs through haematogenous spread from a primary focus with an incidence of 5% approximately [6]. In the Western World, the commonest extra pulmonary site of tuberculosis is the kidney and occurring predominantly in men [7,8]. An autopsy review of renal tuberculosis (TB) found associated fibrocavitary pulmonary lesions in 78% of cases [8]. Most studies on PTB outside Nigeria have shown that 26-50% of renal TB co-existed with active PTB and 6-10% of

screened active PTB cases had renal involvement [9,10,11].

In another autopsy study of 30 active PTB patients who had no renal symptoms, demonstrated histologically that 73% of them had bilateral renal TB [12]

Many authors in Nigeria, have shown that a significant number of extrapulmonary TB patients had PTB [13,14,15].

Osegbe found that 13.5% of 49 renal TB diagnosed had active PTB and their urine demonstrated sterile acid pyuria, AFB and positive culture.

The paucity of data, gained from both clinical practice and autopsy findings, on the prevalence of renal TB in Nigeria tends to give the impression that renal TB is not common [13,14,15,16,17] This may be due to low diagnostic value of clinical features which are often used in the diagnosis as patients with advanced renal TB may be asymptomatic [10,11,12,13].

Moreover, no single investigative tool for the diagnosis of renal TB is infallible and the reliance on clinical features may be deceptive [9,10] Generally, it is not conceivable that the kidney which is one of the highly perfused organs should be resistant to tuberculosis in Nigeria where PTB is endemic [4,5]. This study was done to investigate the prevalence of renal TB in cases of active PTB at Ilorin where an average of 14 new cases with active PTB are seen monthly.

Materials and methods

148 patients (91 males, 57 females) with active PTB were consecutively recruited from the pulmonary clinic and PTB Ward over a one-year period from March 1995 to February 1996. The inclusion criteria were

1. Sputum positive for AFB on two or more occasions
2. Radiological evidence of PTB.

Exclusion criteria were.

1. Diagnosed cases who had started anti-TB drugs two week prior to presentations.
2. Unwillingness to participate.
3. Those aged 15 years and below

These patients were divided according to sex and age (10 years age groups). They were subjected to urine examination with specific reference to acid and alcohol-fast bacilli and sterile acid pyuria.

All PTB patients with AFB in urine on two or more occasions with or without acid pyuria were considered to have renal TB. PTB patients with only sterile acid pyuria on two or more occasions were taken through an investigative Organogram that involved plain abdominal x-rays, intravenous

urogram (IVU) and renal biopsy under ultrasonic guidance with specific reference to features of renal TB. All patients with sterile pyuria and associated radiological evidence of renal TB (renal calcification, calyceal abnormalities, papillary necrosis, cavitory lesions and ureteric strictures) were diagnosed as renal TB

A subset of PTB patients with persistent urinary symptoms and sterile acid pyuria had renal biopsy after a written consent. The inclusion criteria were:

1. Increased white blood cells per cubic millimetre (mm³) of urine.
2. Negative urine cultures for bacteria
3. Normal plain abdominal x-rays and IVU.

The exclusion criteria were.

1. History of antibiotic intake within the previous two weeks of study.
2. Presence of renal stones, prostatitis, pregnancy or malignancy of the urogenital tract.
3. Those on cytotoxic drugs and steroid therapy

Results

148 patients (91 males, 57 females) with active PTB were seen during the study period (March 1995 - February 1996). The majority in both sexes were aged between 20-40 years (Table 1). 68% of males were below 40 years of age as compared to 72% in females

Considering the clinical data 43% of diagnosed renal TB patients had urinary frequency, 36% had nocturia while 28.5% presented with loin pains. Haematuria and dysuria were uncommon (7% each). The only positive physical finding was renal angle tenderness in 36% of the cases (Table 2).

Fourteen patients (8 females, 6 males) were found to have AFB in their urine and they were aged between 18-53 years. Females constituted the majority (57%) with a mean age of 29 years. Males accounted for 43% of the cases with a mean age of 40 years (Table 3)

Thirteen out of the 148 PTB patients had only sterile pyuria while four (2.7%) had both abnormalities in their urine. All PTB patients with both AFB in urine and sterile pyuria were females in the 3rd and 4th decades of life (Table 4)

Ten out of 13 PTB patients with only sterile acid pyuria had renal biopsy and (70%) of them had histopathologic evidence of renal TB. The commonest histopathologic type observed in the biopsies was interstitial nephritis (20%) Chronic pyelonephritis and focal segmental glomerulosclerosis accounted for 20% respectively (Table 5).

No abnormality was detected in all the 8 patients who had IVU. Only one patient showed hydronephrosis on renal Ultrasound (Table 1).

Table 1. Age and sex distribution of PTB patients

	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	Total years
Male	7	35	20	13	14	2	91
Female	6	21	14	7	7	2	57

Table 2. Clinical features of renal TB in the study

Clinical features	Number	% of total
Urinary frequency	6	42.9
Nocturia	5	35.7
Dysuria	1	7.1
Haematuria	1	7.1
Oliguria	-	-
Loin pains	4	28.5
Loin tenderness	5	35.7
No symptoms/signs	4	28.5
Total	14	100

Table 3. Age and sex distribution of PTB with AFB in urine

	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	Total years
Male	-	-	3	-	3	-	6
Female	1	3	1	3	-	-	8

Table 4. Diagnostic methods and the yield obtained

Method	Positive	Negative	Total	% of Total
Z-N Stain	14	134	148	9.5
Sterile Acid Pyuria	13	135	148	8.8
Histology	7	3	10	70
IVU	-	10	10	

Table 5. Renal histology in the study

Histology	Number presenting	% of total
Interstitial nephritis	2	20
Chronic pyelonephritis	1	10
Focal segmental Glomerulosclerosis	1	10
Unclassified	3	30
Normal	3	30

Discussion

The prevalence rate of 9.5% of renal TB in patients with active PTB observed in this study falls within

the range of 6% to 13.5% previously reported by other investigators in active PTB populations [13,18,19,20, 21]. Earlier workers both in Nigeria and Europe had reported a relatively low prevalence of

3.2%, 2.9% and 6% respectively [14,16,19]. Most of the earlier reports in Blacks particularly in Nigeria showed a lower prevalence of renal TB. These studies were retrospective or autopsy findings. The higher prevalence of renal TB could be explained by the study being prospective and the prompt analysis of the specimens. Osegbe in the early eighties found a similar prevalence in Lagos [13] and our findings are almost similar to those reported in Caucasians [20, 21].

The increase in the incidence of renal TB to 14% when combined sterile acid pyuria and positive AFB in the urine were used demonstrated the value of multiple diagnostic criteria. The higher percentage of positive renal TB histology in patients with sterile acid pyuria that were biopsied support the value of sterile acid pyuria. The higher prevalence of renal TB in this study does not support the assumption that the Caucasian kidneys are more prone to renal TB.

The occurrence of Z-N AFB positive urine in 70% of the patients most of which occurred in the 2nd and 4th decades of life in this study had been earlier reported [10,13,22]. Renal TB tends to be rare before the age of 14 years and its rate declines after the 5th decade of life [8, 9,10,23]

There are conflicting reports on the relationship of sex to renal TB infection. While some workers had found a male preponderance. Others denied such difference [10,24].

In our study a male: female ratio of 3:2 was found.

Renal TB can be entirely asymptomatic as observed in 29% in this study. When it becomes symptomatic, urinary frequency usually is the most reported symptom. Nocturia, loin pain, dysuria and haematuria in that order of frequency are other symptoms that had been reported [10,13,25]. Thus, it is not surprising that there is a relative paucity of physical signs in this study.

The only significant physical finding was renal angle tenderness. This is consistent with earlier reports [9,10,11,12,13]. One of the authors found no physical signs in 63% of his cases. Generally the difficulty in early diagnosis and treatment is due to the absence of specific symptoms and signs for renal tuberculosis.

Recent studies have shown that urine Z-N stain is as reliable as urine culture in the diagnosis of renal TB. A positive yield as high as 63-70% of Z-N stained AFB in urine and 24-50% positive AFB culture in urine had been reported by some workers [10,13]. Despite the simplicity and relative sensitivity of these tests but no single method of diagnosing renal TB is infallible. A combination of many diagnostic techniques will yield higher positivity. IVU is not a very sensitive diagnosing tool for evaluating renal infections and normal films have been reported in 75% of patients with proven renal infections [26, 27]. All the IVU results in this study were normal. Ultrasound with high resolution probes and C-T Scan

have been shown to be better radiologic diagnostic tools [28,29]. This study did not demonstrate the sensitivity of ultrasound in the diagnosis of renal TB as only one of the patients showed evidence of renal TB. A combination of urine tests and tissue histology may be more relevant than urine tests alone as urinary findings may originate from other parts of the urogenital system [20].

It is difficult from this study to argue for a relative resistance of the kidneys in the Nigerian African to Tuberculosis as it was previously considered as the prevalence of renal TB found was similar to those reported in Caucasians. A high index of suspicion at all times will definitely increase the diagnostic yield when combined with increased awareness of the disease, improved investigating tools. The absence of these important secondary investigating parameters may be responsible for the erroneous assumption that renal tuberculosis is not common in blacks. In view of the limited number of patients and short duration of the study a more comprehensive and well coordinated country wide study of renal involvement in active PTB in Nigeria is recommended.

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