



## Demographic and clinical peculiarities of urogenital tuberculosis at the present stage

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### ARTICLE INFO

#### Article history:

Received 12.01.2017

Accepted 27.01.2017

#### Keywords:

Urogenital tuberculosis

Urotuberculosis

Nephrotuberculosis

Tuberculous orchiepididymitis

Prostatic tuberculosis

Mycobacteria of tuberculosis

Epidemiology of tuberculosis

### ABSTRACT

With the purpose of investigation of patients with urogenital tuberculosis we have analyzed medical records of 131 the first time diagnosed patients of Novosibirsk Tuberculosis Dispensary from 2009 till 2011.

The leading form in the urotuberculosis structure was nephrotuberculosis, which was diagnosed in 75% patients, and more than a half of these cases distributed destructive forms of the disease. Women suffered from isolated tuberculosis more often (56.8%). Asymptomatic nephrotuberculosis course was noticed at 17% patients, every third complained of a lumbar pain and frequent painful urination (35.2 and 39.8% accordingly), intoxication symptoms were registered at 17%, renal colic — at 9.1%, macrohematuria — at 7.9%. Mycobacteriuria by isolated nephrotuberculosis was detected in 31.8% cases. Tuberculous orchiepididymitis developed acute at 35.7% patients. Main complains by prostatic tuberculosis were ache in perineal region (31.6%), frequent painful urination (also 31.6%), hemospermia (26.3%). Mycobacteria were found out in 10.5% cases. We have concluded that urogenital tuberculosis has no pathognomonic symptoms; the most alarming are the long urination disorder, erythrocyturia, hemospermia.

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### Introduction

In the Annual review the World Health Organization reports, that 10.4 millions new cases of tuberculosis were revealed in 2015: 5.9 millions (56%) men, 3.5 millions (34%) women, also tuberculosis was diagnosed in 1.0 million children (10%). Among these people 1.2 millions were infected by human immunodeficiency virus (HIV). 1.4 millions patients died from tuberculosis in 2015, among them 0.4 millions had HIV co-infection [1].

Generally tuberculous epidemical situation is analyzed detailed by regional and WHO's experts, but epidemical indicators of extrapulmonary tuberculosis (EPTB) keep stay counterintuitive [2–4], that can be explained by both diagnostics complexity, specialists deficiency and different understanding of the main concepts and classifications [5].

Extrapulmonary tuberculosis plays an important role in phthisiology and urology despite the low number of patients. This is caused by higher frequency of fatal complications under some forms of extrapulmonary tuberculosis (significantly worsening life quality) as well as by high association of these diseases with HIV-infection. Unfortunately non-optimal care of the patients with inflammatory

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infection of genitourinary system often leads to blurring the clinical picture of urogenital tuberculosis and to its late diagnostics [6, 7].

Tuberculosis of genitourinary system for a long time took the first place in the structure of extrapulmonary tuberculosis morbidity in the countries of high level of morbidity and the third place in the countries of low level of it, only last years giving way to osteoarticular tuberculosis [2–4]. At first sight urotuberculosis is quite rare and less important disease. But 77% of men dead from any tuberculosis have prostatic tuberculosis not diagnosed during their lifetime – in Russia it is more than 10 000 yearly [8]. Considering that urogenital tuberculosis leads to infertility (both man and woman) [9–11] is becoming apparent that we give less attention to this problem.

*Habitus phthisicus* and intoxication symptoms are not specific to patients with urogenital tuberculosis; there are no strongly marked changes in hemogram and pathognomonic symptoms; isolated forms gave no changes on the photofluorogram [12]. Certainly it makes difficult to diagnose the disease timely. As a rule diagnostics of urotuberculosis happens when patients visit a doctor. Advanced stage of a disease and complicated processes prevail in the structure of newly diagnosed forms. For example M.F. Babenko [13] observed 68 patients with cavernous nephrotuberculosis; 54 of them (79.4%) were examined regularly, but even common urine analysis was not made for 25 patients (36.2%). Only 11 patients (32.4%) with evident laboratory disease indicators (such as pyuria, macrohematuria, proteinuria) were clinically examined completely 18 patients (26.5%) with such diagnoses as chronic pyelonephritis, epididymitis, cystitis, urinary stone disease, lumbosacral radiculitis, prostatitis and others – were treated in therapeutical departments. The other authors noticed, that peculiarity of urogenital tuberculosis is to be hidden under other diseases [14, 15].

## Aim of the Research

Analysis of urogenital tuberculosis structure in patients being at the Novosibirsk Regional Tuberculosis Dispensary and identification of typical clinical symptoms of the disease at the present stage.

## Materials and Methods

Medical records of 131 newly diagnosed patients with urogenital tuberculosis (tuberculosis of urinary and male genital organs) were analyzed. Gynecological tuberculosis was not taken into account in this research. All patients were registered by the Novosibirsk Regional Tuberculosis Dispensary from 2009 till 2011 (continuous sampling). Clinical, age and gender structure of the disease, detection method, and main symptoms of urotuberculosis were studied.

Statistical analyze of the received data was carried out with the use of Microsoft Office Excel 2003. 95% confidence interval (CI) was calculated basing on Poisson normal distribution. Student's t-test was used for proving statistical reliability of the differences between groups. Differences between compared groups were considered as reliable when bilateral statistical significance  $p < 0.05$ .

## Results and Discussion

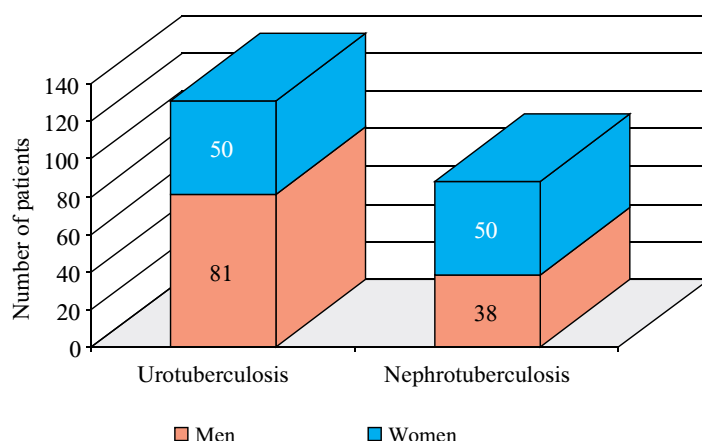
131 patients were examined in total. Isolated nephrotuberculosis was diagnosed in 88 (67.2%) patients (CI 53.9–82.8), tuberculosis of genital organs – in 33 men (25.2%) (CI 17.3–35.8), combination of genital tuberculosis and nephrotuberculosis – in 10 men (7.6%) (CI 3.7–14.0). And everybody has polycavernous nephrotuberculosis. Thus, the leading form in the structure of urotuberculosis was nephrotuberculosis, which was detected in 75% patients (including 8% with genital tuberculosis). Isolated nephrotuberculosis was detected in 88 patients (67.2%).

Generally men prevailed in cohort of urogenital tuberculosis – 81 of 131 (61.8%), women were 50 (38.2%). But reliably rarer ( $p < 0.05$ ) women suffered from isolated nephrotuberculosis – 50 of 88 (56.8%), and 38 men (43.2%) (Figure 1). From 1990 till 2008 more than 60% fell to the share of women, but from 2008 the tendency to shifting the gender rates was discerned and to 2011 the rate of male and female patients reached the values pointed out in foreign literature – 2:1. Objective and evident reasons of such proportion are seems to be impossible to define.

Comparative and age characteristic of patients with nephrotuberculosis and genital tuberculosis is represented on the Figure 2.

In such a way mostly the small forms of nephrotuberculosis were diagnosed in patients of young age that can be explained by more close attention of phthisiopediatrician to the patients, and by obligatory bacteriologic examination of children from epidemic risk group. On the contrary, advanced stages of a disease are detected more often in patients of middle and old age that indirectly indicates a long chronic urotuberculosis course with gradual progression of destructive process.

In the structure of nephrotuberculosis (98 cases, including 10 cases of combined kidney and male genital organs damage) more than a half accounted for distributed destructive forms of the disease. Isolated cavernous nephrotuberculosis was diagnosed in 22 patients (22.5%) (CI 14.1–34.0), isolated polycavernous – in 21 patients (21.5%) (CI 13.3–32.8), but considering that 10 men (10.2%) (CI 4.9–18.8) with generalizable damage of urogenital system also



**Figure 1.** Gender structure of urogenital tuberculosis (n = 131) in the common cohort and sampling of nephrotuberculosis patients

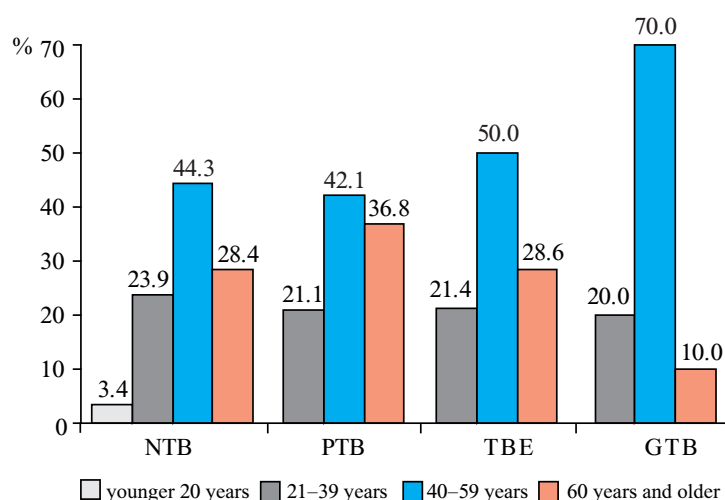
had polycavernous nephrotuberculosis, and the part of advanced stage of a disease increases upto 54.0%. Tuberculosis of kidneys parenchyma was detected at 10 people (10.2%) (CI 4.9– 8.8), 35 patients 35.7% were observed concerning tuberculous papillitis (CI 24.9–49.8).

In such a way patients suffered from distributed destructive forms of tuberculosis keep prevailing among nephrotuberculosis patients.

While analyzing the clinical age structure of the patients depending on the diagnosis the tuberculosis of kidneys parenchyma was detected in 10 patients (6 men and 4 women). There were two children aged of 3 and 6 years, one teenager of 17 years, 4 patients of 21–39 years, 3 patients of 49–59 years. There were nobody older than 60 years. All children with tuberculosis of kidneys parenchyma were revealed by examination of their tuberculous risk contacts. Patients did not complain of the urogenital system, i.e. disease course was without any symptoms. For example, a girl of 17 years has been suffered from chronic pyelonephritis

during five years (there were changes in the urinary tests, ache in the kidney area). As this category of patients is in risk group, bacteriological examination of the urine was carried and showed a mycobacteriuria. Advanced asymptomatic stage of the disease was detected also in 3 patients among other seven adult patients (they were examined as the contacts). Two other patients showed intoxication symptoms, one had macrohematuria, and another one had recrudescence renal colic in past medical history. In such a way among patients suffered from tuberculosis of kidneys parenchyma only three people had specific urologic complaints (renal colic, macrohematuria, ache in the kidney area). Intoxication symptoms were noticed in two people that did not allow to assume kidney damage, and five people did not complain of the urogenital system. Bacteriological verification was obtained in all patients.

Women prevailed among patients suffered from tuberculous papillitis – 22 (62.9%), 13 people were men (37.1 %). There was nobody younger than 20



**Figure 2.** Age structure of patients suffered from urotuberculosis (n = 131) (NTB – nephrotuberculosis; PTB – prostate tuberculosis; TBE – tuberculous epididymitis; GTB – generalizable tuberculosis)

years among patients suffered from tuberculous papillitis. There were 13 people both at the age of 21–39 and 40–59 (37.1 and 37.1% accordingly). 9 people (25.8%) of patients older than 50 were revealed. More often patients with tuberculous papillitis pointed out ache in the kidney area — 16 people (45.7%), the same frequency of complaints was ones of frequent painful urination. Intoxication symptoms (subfebrility, asthenia, general uneasiness) were pointed out in 9 patients (25.7%). Macrohematuria was in 5 patients (14.3%). Asymptomatic disease course was registered in 5 cases. Two and more symptoms were registered in almost all the patients. Bacteriological confirmation of a diagnose was received only at 7 patients (20%). In the rest 28 patients the diagnose was based on the results of epidemical anamnesis estimation, clinical data, ineffectiveness of preceding nonspecific treatment, results of provocative tests, and therapy *ex juvantibus*.

22 people were registered having cavernous nephrotuberculosis. Women prevailed 2 times (15 female patients), while there were 7 men in this group. All the patients were older than 20 years: 3 people age of 21–39 years, and 11 people — of 40–59 years. There were 8 patients in the old age group (older than 60 years). Share shift to the old age in comparison with the group of patients suffered from tuberculous papillitis highlights untimeliness of diagnostics. Probably in the younger age these patients had already nephrotuberculosis, but the disease was not revealed timely and only during some time, when the patients became older, and the disease — more expressed, the nephrotuberculosis was detected. Asymptomatic course under cavernous nephrotuberculosis was detected only in 3 patients (13.6%) by changes in urinary test, which was done concerning any other cause. 4 patients (18.2%) had renal colic, 7 patients (31.8%) had dysuria, 15 people (68.2%) complained of ache

in the kidney area. Macrohematuria was detected in 4 patients (18.2%), the diagnosis was verified mainly pathomorphologically and radiologically.

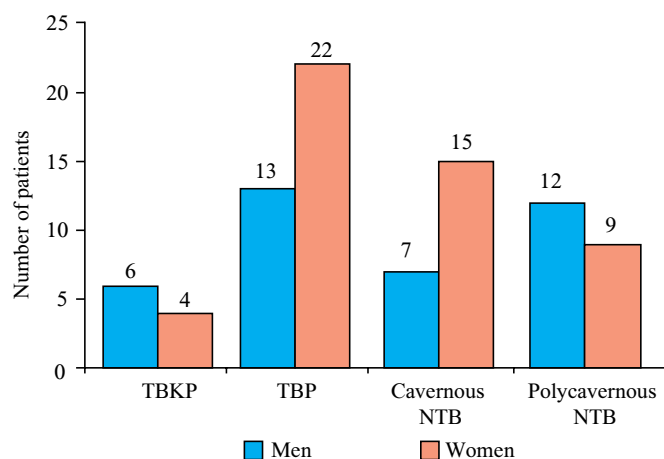
21 patients with isolated nephrotuberculosis were registered concerning polycavernous nephrotuberculosis. There were 12 men (57.1%) and 9 women (42.9%) in this group. All patients are older than 20 years: 1 patient of 21–39 (4.8%), 12 people of 40–59 (47.6%), 8 people of 60 years and older (38.1%). The most specific symptom in this group was dysuria — 12 patients (57.1%), and ache in the kidney area — 9 patients (42.9%), renal colic — 3 patients (14.3%), and macrohematuria — 1 (4.8%). Kidney damage in one patient with pulmonary tuberculosis was not manifested by itself and was detected in the process of observation and treatment of the main disease accidentally, by ultrasound investigation. Intoxication symptoms were met in 19.0% cases (4 patients), mycobacteriuria — in 33.3% cases (7 patients).

Gender and age structure of patients suffered from isolated tuberculosis is represented on the Figures 3 and 4.

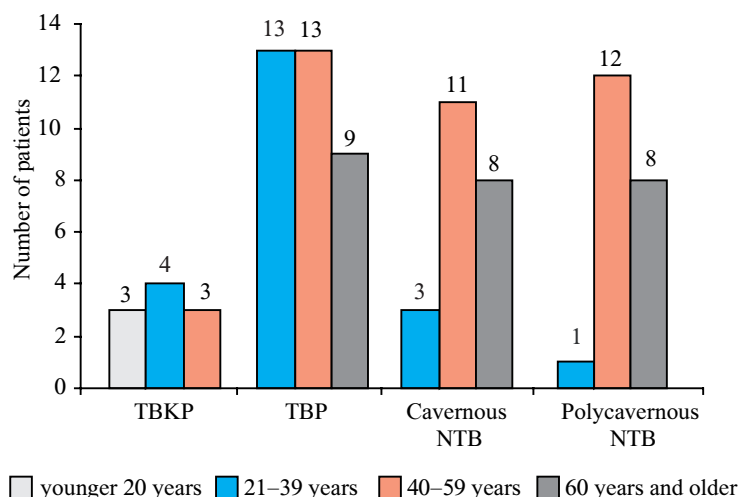
Thus we see regular prevalence of people older than 40 years among patients with distributed destructive forms of nephrotuberculosis that reflects pathogenesis of nephrotuberculosis — slow progressing disease course.

We also analyzed a structure of clinical symptoms of nephrotuberculosis (Figure 5).

Analysis of clinical symptoms shows that even distributed destructive process may not cause any patient complaints. In contrast, the less common form of the disease (tuberculosis of kidneys parenchyma) is a real reason for visiting a doctor. There was not a single complaint specific for nephrotuberculosis, all detected symptoms can be observed under other urologic diseases.



**Figure 3.** Gender distribution of patients suffered from isolated nephrotuberculosis (n = 88) (TBKP — tuberculosis of kidneys parenchyma; TBP — tuberculous papillitis; NTB — nephrotuberculosis)

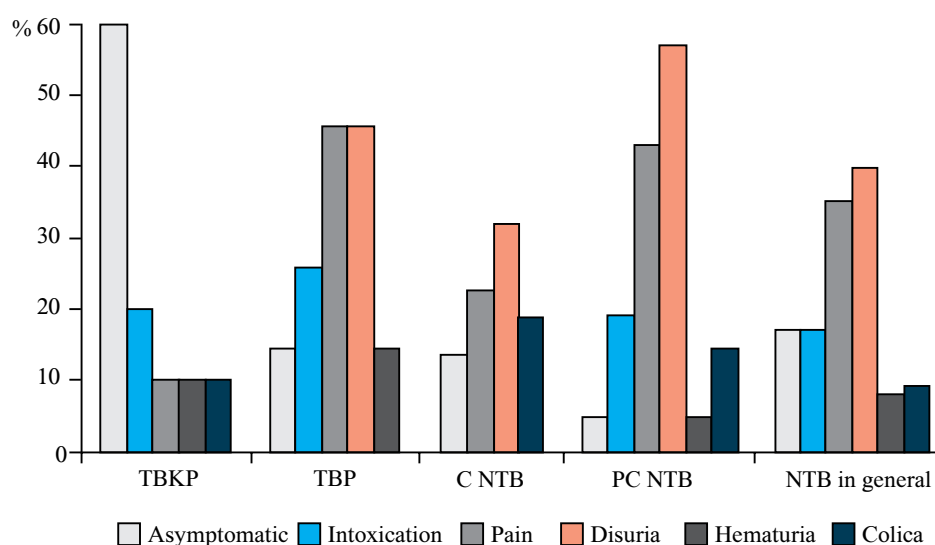


**Figure 4.** Age distribution of patients suffered from isolated nephrotuberculosis (n = 88) (TBKP – tuberculosis of kidneys parenchyma; TBP – tuberculous papillitis; NTB – nephrotuberculosis)

Prostatic tuberculosis was diagnosed in 19 patients (nobody younger than 20). Four people (21.0%) was of 21–39 years, eight people (42.1%) – of 40–59, seven patients (36.8%) of 60 and older. The main complaints patients with prostatic tuberculosis were: pain of perineal region (6 patients – 31.6%), frequent painful urination (6 patients – 31.6%). These complains did not differ by their peculiarity. Hemospermia was a reason to visit a doctor in 5 patients (26.3%), erectile dysfunction – in 2 patients (10.5%). One patient had intoxication symptoms (5.3%). Asymptomatic disease course was pointed out at 2 pulmonary tuberculosis patients (the diagnose was verified pathomorphologically after accompanying

prostate biopsy concerning benign hyperplasia). Mycobacteria of tuberculosis were detected in prostatic fluid/ ejaculate in 2 cases.

Tuberculous orchiepididymitis was diagnosed in 14 men (the all were over 20). Three people (21.4%) were of 21–39 years, seven patients (50.0%) – of 40–59, four patients (28.6%) – of 60 and older. The disease debuted by increase of testis in eight patients (57.1%), that was accompanied by scrotum pain in five of them (35.7%). Hemospermia was pointed out in one patient (7.1%), dysuria – in five patients (35.7%). Acute beginning of the disease was registered in 5 patients. Mycobacteria of tuberculosis in urine or genital gland appendages were not revealed in any cases.



**Figure 5.** Complaints variety of patients suffered from nephrotuberculosis (n = 88) (TBKP – tuberculosis of kidneys parenchyma; TBP – tuberculous papillitis; C NTB – cavernous nephrotuberculosis; PC NTB – polycavernous nephrotuberculosis)



Simultaneous damage by tuberculosis of urinary and male genital system organs was observed in 10 patients (nobody was younger than 20). Two people of 21–39 years were registered, seven people — of 40–59 years, and one patient — older than 60 years. A half of the patients complained of urination disorder, 3 patients — of ache in the kidney area, and 2 — of hematuria. One case of complaints of blood in ejaculate and pain in perineum were pointed out, another one showed intoxication symptoms. The disease began from the acute orchiepididymitis in two patients, from the main complaint of painless increase of epididymis in one patient. Mycobacteriuria was detected in four patients.

## Conclusion

The carried out analysis allowed us to draw the following conclusions:

1. Leading form in the structure of urotuberculosis is nephrotuberculosis, which was detected in 75% patients (genital organs were also involved into the process in 8% among them). In the nephrotuberculosis structure, including combined damage of kidneys male genital organs, more than a half of observations accounted for distributed destructive forms of the disease. Women suffered from isolated nephrotuberculosis more often (56.8%).

2. Prevalence of people older 40 years among the patients with distributed destructive forms of nephrotuberculosis indicates the slow progressing course of the disease.

3. Asymptomatic course of nephrotuberculosis was pointed out in 17% patients, every third complained of ache in the kidney area and frequent painful urination (35.2 и 39.8% accordingly), intoxication symptoms were in 17%, renal colic — in 9.1%, and macrohematuria — in 7.9% . Mycobacteriuria under isolated nephrotuberculosis was detected in 31.8% cases.

4. Tuberculous orchiepididymitis developed acutely in 35.7% patients, hemospermia was pointed out at 7.1%, dysuria — at 35.7%. The main complaints for prostate tuberculosis were on pain in perineal region (31.6 %), frequent painful urination (also 31.6%), hemospermia (26.3%); mycobacterium was found out in 10.5% cases.

5. Urogenital tuberculosis has no pathognomonic symptoms; the most disturbing are long urination disorder, hematuria, and hemospermia.

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