RST Research and Science Today
WWW.RSTJOURNAL.COM
SUPPLEMENT 2/2018
ISSN-E: 2344-0007 / ISSN-L: 2344-0007

Medicine

RENAL TUBERCULOSIS – A CHALLENGE IN DIAGNOSTIC AND TREATEMENT

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ABSTRACT:
TUBERCULOSIS IS CAUSED BY A BACTERIA CALLED MYCOBACTERIUM TUBERCULOSIS. THESE DESEASE STILL REMAINS A SERIOS HEALTH ISSUE IN UNDEVELOPED COUNTRIES. IT USSUALY AFFECTS THE RESPIRATORY TRACT, BUT ALSO HAVE EXTRAPULMOARY LOCATIONS. FROM THE EXTRAPULMONARY CASES, RENAL TUBERCULOSIS IS FOUND IN 27% OF THE CASES. EXTRAPULMONARY TUBERCULOSIS IS USUALY DISCOVERED IN PATIENTS WITH DEPRESED IMMUNE SYSTEM LIKE PATIENTS WITH HIV AND AFTER DIFFERENT ORGAN TRANSPLANTATION. THE INVOLVEMENTT OF THE KIDNEY IN TUBERCULOSIS CAN BE PART OF A DISSEMINATED INFECTION OR A LOCALIZED GENITOURINARY DISEASE, AND IT REPRESENTS A CHALLENGE IN DIAGNOSTIC. THE PATIENTS WITH RENAL TUBERCULOSIS PRESENTS STERILE PYURIA. AS TREATEMENT, THE FIRST LINE IS REPRESENTED BY ISONIAZIDE, RIFAMPICIN, PIRAZINAMIDE, ETHAMBUTOL, AND STREPTOMYCIN, BUT NOT IN FEW CASES SURGICAL INTERVENTION IS REQUIRED BECAUSE IF LEFT UNTREATED CAN LEAD TO RENAL DISTRUCTION, OR A SMALL AND UNEXTENDABLE BLADDER.

KEY WORDS: TUBERCULOSIS, TREATMENT, SURGERY, KIDNEY

INTRODUCTION

Urinary tract tuberculosis is mainly asympthomatic, which can easily be misdiagnosticated and therefore appears a riskof renal function loss or general complications[11]. Sympthoms in renal tuberculosis (TB) usualy includes flank pain, haematuria, and other factors must be included: hydronephrosis of unknown causes descovered on ultrasound exam, small bladdercapacity, nonvisualized kidney on intravenousurography, or impaired renal function on radionucliderenogram[12].

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ISSN-E: 2344-0007 / ISSN-L: 2344-0007

MAIN TEXT

Extrapulmonary TB tends to appear in patients infected with HIV. They have 20–37 times greater risk of developing renal TB than normal people[13], and it is the most frequent oportunistic infection in patients with HIV. TB can appear on any of the phases of the HIV infection. Renal biopsy in these type of patients shows a severe interstitial inflammation and mild-to-moderate mesangialproliferation. Studies show that TB contributesto proteinuric in HIV-infected patients and after treatemon for TB the renal function returns to normal and the proteinurea decreases to normal[14].

Patients with hisory of tuberculoses and that had undergone kidney transplantations and have recived immunosupressive drugs tend to develop renal TB. A studie performed by Matuck et all showed that 4,5% of patients with renal transplant tend to develop renal TB[15].

Other cases of urogenital TB have been reported in patients with bladder tumors that have been endoscopicaly resected, and after the resection they have recived instilations with BCG[16].

A renal lesion caused by the infection with *Mycobacterium tuberculosis* can dissemitate through the renal capsule and mimic a neoplazic lesion. When the ureter is involved in the dissemination proces stenosis and dillatation occure, leading to obstruction and reflux[17].

FIZIOPATHOLOGY IN RENAL TUBERCULOSIS

Renal tuberculosis is usualy a part of a disseminated infection from the respiratory tract or a localized genitourinary disease. Pulmonary infection is the most important. The renal system is mostly affected by milliary TB.The milliarylesions areusualy found in renal tissue because of the hematogenicdissemination. It is specialy located in the cortical region. Some pacients can present renal failure without evidence of typical localized lesionsin the renal parenchyma[18].

The hematogenic dissemination is caused by a vessel errosion, the most commonly a vein in the lung. From here the emboli containing the microorganisms gets into systemic circulation. From here the bacillus arrives in organs where it has conditionsto proliferate, like the kidney, epididymis,encephalus, bone marrow,and the terine tubes. In the kidneys, the preferred place for colonization byM. tuberculosis is the medullary region, where granulomatouslesions can occur, with caseous necrosis, which leads to local tissuedestruction. When the dissease progresis, it appears anbigger area of papillary necrosis that can cause the apparition of cavities that destroy the renal parenchyma. After the caseum cavity appears the next step in the evolution of the disease if it is still left untreated is the migration into the collecting system of the bacilus. Papillarynecrosis usualy appears when vascular insufficiency appears in the renal papillae. When the infection reaches the pelvis it causes a tuberculous pyelonephritis, after that it can evolve to pyonephrosis,

[13]World Health Organization. *Tuberculosis and HIV*. Available at: http://www.who.int/hiv/topics/tb/en/. Accessed September 10, 2012
[14]Nourse PJ, Cotton MF, Bates WD. *Renal manifestations in children co-infected with HIV and disseminated tuberculosis*. Pediatr Nephrol, 2010, 25: 1759–1763
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which in the end casuses renal insuficency where the only treatement is represented by nephrectomy[19].

Min-Bo Yan et al performed a study on a lot of 53males and 30 females with a mean age of 36 that had been diagnosticated by symptoms, a urinary tuberculosis test,cystoscopy and computed tomographic urography with pulmonary tuberculosis. 72 of these patients olso had renal tuberculosis. In all cases renal tuberculoses was presented on one side only, with normal renal function on contralateral side. Because the affected side showed severly impared renal function, nephrectomy was neccesary. Prior to surgery all pacients underwent antituberculosis chemotherapy, for one and a half to six months. All the operations wereperformed successfully using laparoscopic retroperitoneal technique. After the surgery 75 patients were followed-up, the symptoms of urinaryfrequency and urgency disappeared, and no activetuberculosis lesions were observed at the ESR level. Also no tuberculosis bacili was detected postoperational in urine sample[20].

Another study was performed by VinayakGorakhanathWagaskar et al on a lot of 31 patients with renal tuberculosis with the purpouse to analyse challenges in reconstruction of the urinary tract in patients with urinary tuberculosis and renal failure. The majority of the patients were male 18 of 31. The sympthoms included flank pain, disuria and frequancy, fever, renal failure, haematuria, even scrotal pain. A total of 11 patients patientspresented simultaneous kidney, ureter and bladder involvement or bilateral disease. From the imagistic point of view on a plain X-ray film of abdomen or on CT image it can appear: distortion, scarring, hydronehrosis or hydroureteronephrosis, calcifications, fistula when contrast substance is used, ureteric strictures, vesico-ureteral reflux, reduced capacity of the bladder and irregularities of the bladder.

All the patients received anti-tuberculose therapy. A total of 11 patients with an advanced disease in the form of multiple calyceal involvement or simultaneous kidney, ureter and urinary bladder involvement, with a creatinite level of 2-3 after external drainage required a surgical procedure: four patients underwent ureterocalicostomy procedure and three out of them had single functioning kidney. The surgery failed in all 4 patients. Four patients required bladder augmentation with ureteral reimplantation[21].

The reconstruction procedures, such as uretero-ureteral anastomosis, pyelo-ureteral anastomosis, caliceal reconstruction, uretero-caliceal anastomosis , andureter substitution by ileus are performed in 40% of the cases[22].

Sometimes the renal infestation is manifested late in the evolution of the disease like the case presented by *S. Toccaceli et al*, where a 67 year old male presented himself to the emergency room in Rome with abdominal paine, constipation by 36 hours. The clinical examination revealed the presence in the entire left abdomen of a fixed mass with irregular margins of about 30 cm. After a

[19]Yarger WE, 1991. *Urinary tract obstructive*. Brenner BM, Rector FC, eds. The Kidney. Fourth edition. Saunders: Philadelphia/ London: W.B. Saunders, 1768–1808

[20] Min-Bo Yan, Jing Lu, Xiao-Feng Li, Zhen-Yu Guo. *Clinical analysis of retroperitoneoscopic nephroureterectomy for renal tuberculosis.* Chronic Diseases and Translational Medicine, 2015, 1, 217e220

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ultrasonography and a CT was performed who revealed presence of a retroperitoneal mass of renal origin completely filling the left retroperitoneal space, from the subdiaphragmatic area to the iliac fossa. The mass displaced the spleen and the descending colon. The optimal line of treatement for the patient was nephrectomy. The HP result proved the tumor to be a huge post-tuberculosis chalk kidney. Postoperativecourse was with no significant events and the patient was dischargedon 8th day. The treatement at home was a therapy based on isoniazid 250 mg twice a day[23].

DISCUSSIONS

Since the late 1980s, the incidence of tuberculosis increased in the US and Europe while the disease was virtually eradicated by the BCG vaccine. This can be explained by the apparition of the HIV and the immunosuppresion it creates,by the emergence of bacterial strainsresistant to usual treatments[24]. Renal localization of tuberculosis is ussualy the result of hematogenousspread of mycobacteria from a pulmonary focus.The renal infection with this baccilus appears in 8 to10% of cases of primary pulmonary infection. The pulmonary infection is the gateway from where the infection spreads.

There were a few cases, less than 50, of tuberculous kidney cancer reported[25]. In the literature, the conventional cell adenocarcinoma is themost frequent hystological type of renal cancer. The combination of a tuberculouslesions to other tumor histological types such as transitional cellcarcinoma has rarely been described[26].

Nephrectomy via the peritoneal and the retroperitonealapproach are the two main procedures performed when the TB infection destroys the renal parenchima, and a surgical treatement must be performed. Also reconstructive procedures like pieloplasty or partial nephrectomy, clasical, laparoscopic or robotic assisted, are performed. The retroperitonealapproach can avoid dissemination of the tuberculosisbacterium and can reduce interference to the abdominal organs, but sometimes it can be difficult to be performed in particular when the TB infection causes a perinephritic reaction and inflamation which proves a real challenge when the kidney disection is performed[27]. In laparoscopic nephrectomy procedures for tuberculousnonfunctioning kidneys, the main reasons forconversion to open surgery are perinephric adhesionsand intraoperative major hemorrhages. It is extreamly important not to spill caseous materials from the kidney when the kidney dissection is performed, because there is a high risk to contaminate other vecinity organs[28].

Laboratory examinations are important means of diagnosis ofrenal TB.The correct line of approach is that the patients should stop antiTBand antibacterial drugs 1week before the urine smear for acidfastbacilli, which should be performed 3 times in a row to improve thepositive testing rate.

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[23] S. Toccaceli, L. Perisco Stella, M. Diana, A. Taccone, G. Giulliani, L. de Paola, M. Valvano. *Renal tuberculosis: a case report*. G Chir, 2015, 36(2), p. 76

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CONCLUSION

Tuberculosis has a high incidence in developing countries.There is a worrisome underdiagnosis of renal TB, which leadsto development of renal insufficiency, chronic kidney disease,and ESRD. If the patient presens uretherohydronephrosis with the evient loss of kidney fuction, nephrectomy is to be performed via clasical or laparoscopic approach. New research is needed to trace the mainforms of clinical presentations of renal TB, as well as to developnew more efficacious diagnostic methods and less toxic anti-TBdrugs.

ISSN-E: 2344-0007 / ISSN-L: 2344-0007

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