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Asymptomatic Candiduria in Kidney Transplant Recipients

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ABSTRACT

Infections remain a major cause of morbidity and mortality in kidney transplant patients and can be prevented by regular screening after transplantation.

Candidiasis is common after renal transplantation and *candida albicans* is the most isolated species. The clinical presentation isn't specific and sometimes asymptomatic.

The etiological investigation is guided by epidemiological data specific to this population and by an analysis of individual risk factors as well as a mycological study which constitutes the key examination for positive diagnosis and resistance to antifungal agents.

In this study, we report the results of a screening program for asymptomatic candiduria in renal transplant patients at the Mohammed VI University Hospital of Marrakech (Morocco).

Keywords: Candiduria, kidney, screening, transplantation.

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I. Introduction

Infections are very frequent after renal transplantation, in which mycosis is predominant [1].

Candida sp. is the species most frequently responsible for mycosis after renal transplantation, and its identification has undergone great technical progress in parasitology and mycology laboratories [2].

The aim of our study is to detect asymptomatic candiduria in a population of kidney transplant patients.

II. Patients and Methods

This is a prospective and descriptive study of screening results of candiduria in 39 patients who had undergone renal transplantation, with a follow-up at the nephrology department of the CHU Mohammed VI of Marrakech.

The urine was collected during the consultations and sent to the parasitology-mycology laboratory of the Mohammed VI University Hospital in Marrakech for cyto-mycological examination.

Urine sampling followed the same rules as for a cytobacteriological examination.

- Hand washing + careful washing with soap or mild antiseptic of the vulva in women and the urethral meatus in men + rinsing
- Discard the 1st urine stream (≈20 mL).
- Collect the 2nd stream (≈20 mL) in a sterile bottle.
- Identification and immediate transport to the laboratory (possibly preservation is possible within a few hours at 4 °C or the use of a borate tube containing a preservative).

Identification was carried out Based on positive cultures using the VITEK automated system, which allows the identification of 50 yeasts.

The study of the urine was carried out in 3 steps (Fig. 1).

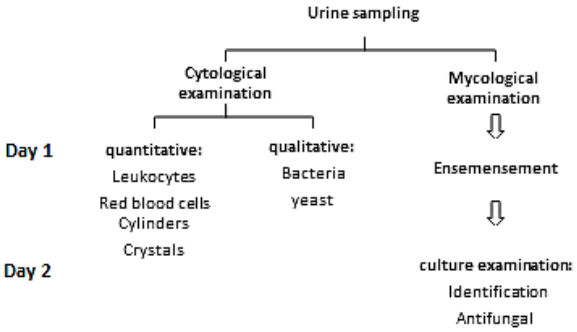

Fig. 1. Steps in the cyto-mycological examination of urine.

III. Results

Among the 39 cases, 59% were male, the average age was 49.3 years.

Clinically, all patients were followed in the nephrology department and treated by immunosuppressive therapy (anti-calcineurin, corticoids, mycophenolate mofetil), and all patients were asymptomatic.

Macroscopically, the urine was cloudy in 7.6% of cases, microscopically, direct examination was positive in 10% of cases, with evidence of budding yeast, indicating their pathological nature (Fig. 2), the white blood cell count was significant in 20.5% of cases, crystals were noted in 2.5% of cases, and epithelial cells were present in 23% of cases.

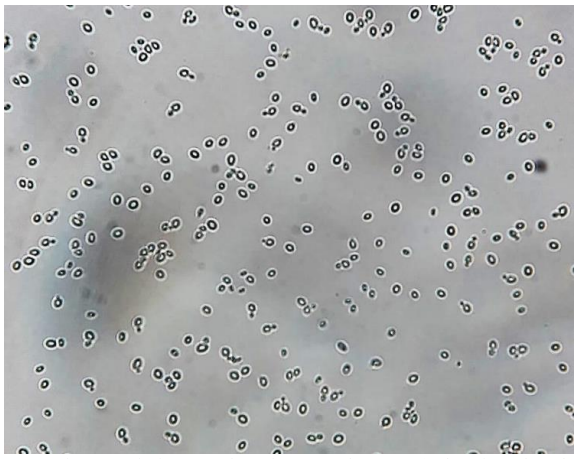

Fig. 2. Microscopic image of a urine sample (× 400) showing abundant yeast with occasional budding.

5 cases had a positive culture (12.8%) after eliminating vaginal and faecalis contamination, one case of vaginal contamination with *candida spherica* and 2 cases of faecalis contamination with enterococcus. True candiduria was reported in 2 cases, one with *candida glabrata* and the other with *candida krusei*, both cases were female.

TABLE I: Results of Cyto-mycological Examination of Urine

	Percentage
Macroscopic examination	
Appearance: clear	92,4%
Turbid	7,6%
Microscopic examination:	
Significant white blood cells	20,5%
Crystals	2,5%
Epithelial cells	23%
Presence of yeasts	10%
Positive culture	12,8%
Identification (true candiduria)	*candida glabrata*: 1 cas *candida krusei* : 1 cas

IV. Discussion

The urinary tract is the most common site of infection after renal transplantation [3]. Fungal infections are very common. Numerous studies are available on the epidemiology and risk factors of candiduria in general populations, especially in critical patients. [4] However, in renal transplant patients, the epidemiology of candiduria is unknown.

The majority of patients with candiduria are asymptomatic [5]. All patients in our study who had a positive culture were asymptomatic.

Candida sp. is a commensal agent of genitourinary mucosa and becomes pathogenic pathogenic in the presence of well identified favorable factors (Table II).

The progression from colonisation to full-blown infection is difficult to diagnose and requires careful cyto-mycological examination of the urine in conjunction with other epidemiological and clinical data [6].

TABLE II: Factors Favouring Urinary Tract Colonisation by *Candida sp*. [7], [8]

Factors
- Female gender
- Anatomical abnormalities of the urinary tract, congenital or acquired
- Older age
- Pregnancy
- Diabetes/glycosuria
- Nephrolithiasis
- Bladder dysfunction, urinary stasis (partial emptying)
- Broad spectrum antibiotic therapy
- Bladder catheter
- Urinary tract instrumentation
- Hospitalization and intensive care unit stay
- Renal transplantation

The species most frequently responsible for deep candiduria after renal transplantation remains C. albicans and other emerging species (C. tropicalis, and especially C. glabrata and C. krusei) [9].

In our study 2 strains were isolated, *candida glabrata* and *candida krusei.*

The diagnosis of an infection limited to the genitourinary tract or disseminated can be suggested by the presence of the usual general signs of infection and by the detection of an elevated plasma level of beta-D-glucan. [6]

The management of candiduria is limited by the lack of study data on the effectiveness of treatment with antifungal agents. As a result, treatment indications are not well defined [10] and treatment should be selected according to clinical circumstances and antifungal test results [6].

In ambulatory medicine, fluconazole is the treatment of choice due to the predominance of susceptible *Candida* species, as well as its excellent oral bioavailability and high urinary concentration [6].

Although fluconazole is the drug of choice for the prophylaxis and treatment of patients with candiduria, prolonged use of this agent has contributed to the development of drug resistance in *Candida* species [11].

V. Conclusion

The arrival of new techniques of identification and mycological study in the laboratory has allowed earlier and more precise diagnoses of candiduria, especially in vulnerable subjects such as kidney transplant patients, thus leading to early and effective management.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

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