

## Bacterial Multiresistant Diagnosed in Urine Cultures of Transplanted Patients: Case Report

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Received date: July 24, 2017; Accepted date: August 23, 2017; Published date: August 28, 2017

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### Abstract

The Urinary Tract Infections (UTI) are among the most frequent pathologies exposed in clinical appointment by patients undergoing kidney transplantation. The diagnosis and characterization of UTIs are important to elucidate the main microorganism involved and draft the profile of antibiotics that can be used to treat these infections. The case 1 introduces a female, 76-years-old patient, kidney transplanted, diagnosed with a variety of microorganisms resistant to multiple antibiotics over the years, and who died before the end of the treatment. The case 2 introduces a man, 65-years-old patient, kidney transplanted, who also presented a persistent urinary infection and a high colonies counting in his urine cultures, as well as multi-resistance to antibiotics tested. Given the above, it emphasizes the importance of monitoring and controlling urinary infections that affect the post kidney transplant patient, in an attempt to avoid possible complications to the transplanted organ.

**Keywords:** Kidney transplantation; Infection; Drug resistance

### Introduction

Urinary Tract Infections (UTIs) are the most frequent complications faced by kidney transplant patients [1,2] and there are many predisposing factors such as: hidden infections in graft donor or recipient; underlying renal pathology; contamination of the preservation fluid; roll bodies in the incision during surgery and the type of immunosuppressive employed during bladder catheterization. Some studies cite these factors as possible contributors to development of this infection in post kidney transplanted patients who acquiring symptomatic or asymptomatic UTI [3-5].

The UTI can accelerate the process of chronic graft rejection, giving significant morbidity and mortality after kidney transplantation, which can be accelerated as a result from, immunosuppressant used by patients, happening this infection, more frequently during the initial phase of post-surgical recovery [6,7].

Bacteria resistant to multiple antimicrobial represent a challenge in the treatment of ITU [8]. Antibiotics widely used in the treatment of infections such as sulfamethoxazole/trimethoprim, nalidixic acid, nitrofurantoin, ciprofloxacin, norfloxacin, among others, have shown significant levels of resistance to various etiological agents of urinary tract infection [9-11].

### Case 1

Woman, 76-years-old, kidney transplanted in 2009, who had been accompanied since 2013, by the School Laboratory of ASCES College, where she underwent laboratory tests. Urine cultures from the patients were collected and processed, respecting all aseptic precautions indicated by the exams guideline. Between the years 2013 to 2016, the

patient underwent various urine cultures needed in post-transplant follow-up period in a total, were sixteen positive, which showed significant results regarding bacterial resistance. In 2013, the patient had four positive urine cultures, as microorganisms identified: *Staphylococcus saprophyticus*, *Morganella morganii* and two positive tests to *Escherichia coli*, with Colony Forming Unit (CFU) counts of  $10^6$ ,  $55 \times 10^4$ ,  $75 \times 10^4$  and  $95 \times 10^4$  CFU/mL, respectively. Regarding antibiotics tested, these microorganisms exhibited in some urine cultures, resistance to the following antibiotics: ceftriaxone, cefoxitin, ciprofloxacin, ceftazidime, cephalothin, norfloxacin, amoxicillin and clavulanic acid, levofloxacin, aztreonam, gentamicin, cefotaxime, tetracycline, cefepime, ampicillin, cefadroxil, cefpodoxime, cephalixin, amikacin and ampicillin-subactam, highlighting resistance to linezolid against *S. saprophyticus*. In 2014, the patient had eight urine culture with positive results, three of them with *E. coli* ( $10^6$ ,  $95 \times 10^4$ ,  $10^6$  CFU/mL) as the etiologic agent. The resistance profile showed bacteria resistant to 22 antibiotics, sensitivity only to nitrofurantoin, meropenem and imipenem. Other positive urine cultures showed: *S. saprophyticus* ( $10^6$  CFU/mL) resistant to tetracycline, trimethoprim, nitrofurantoin and sulfamethoxazole; *Klebsiella* spp. ( $58 \times 10^4$  CFU/mL) resistant to all antibiotics tested, and three positive urine culture with *Proteus* spp. and counts  $39 \times 10^4$ ,  $68 \times 10^4$ ,  $75 \times 10^4$  CFU/mL, respectively, only sensitive ceftazidime, aztreonam, imipenem, cefepime and imipenem. In 2015, there were three positive urine cultures, all identified with *Pseudomonas* spp. ( $88 \times 10^4$ ,  $10^5$ ,  $10^5$  CFU/mL) as the etiologic agent which showed resistance to 17 antibiotics tested and sensitivity only to ceftazidime, aztreonam and polymyxin B. In 2016, only one urine culture proves to be positive, with the presence of *Proteus* spp. ( $10^5$  CFU/mL) resistant to norfloxacin, ciprofloxacin, amoxicillin/clavulanic acid and sulfa/trimethoprim. From this last diagnosis, there was not any positive urine culture performed by the patient. Actually, it was reported to the School Laboratory, the woman's death that happened in 2016. Given

the above, stands out in this case, the evident bacterial multidrug resistance, as well as the diversity of etiological agent isolated.

## Case 2

Man, 65-years-old, kidney transplanted in 2008, who had been accompanied by School Laboratory of the ASCES College since 2012, where he underwent laboratory tests. The patient's urine cultures were collected and processed respecting all the necessary aseptic care indicated by guideline. From 2012 to 2016, the patient had nine positive urine cultures diagnosed, with important results, as the persistence of urinary tract infection and the resistance profile of the isolated bacteria. In 2012, the patient got positive result in two urine cultures, both identified with the etiologic agent *Klebsiella oxytoca*  $84 \times 10^4$  and  $77 \times 10^4$  CFU/mL counts, respectively, both tests without significant resistance presented by the bacteria. In 2013, three urine cultures were identified with the infectious agent *E.coli* with count of  $71 \times 10^4$ ,  $60 \times 10^4$ ,  $99 \times 10^4$  CFU/mL count respectively. The antibiotic susceptibility showed, in general way, resistance to nitrofurantoin, amikacin, ofloxacin, cephalexin, levofloxacin, cefadroxil, cephalothin, trimethoprim, amoxicillin/clavulanic acid and trimethoprim/sulfamethoxazole. In 2014, two urine cultures were positive; the first had *E. coli* ( $10^6$  CFU/mL) resistant to nitrofurantoin, ofloxacin, ciprofloxacin, and trimethoprim/sulfamethoxazole and the second, *S. saprophyticus* ( $10^6$  CFU/mL) resistant to nitrofurantoin, norfloxacin, levofloxacin, erythromycin, clindamycin, trimethoprim/sulfamethoxazole. In 2015, only one urine culture was identified positive with *E. coli* ( $10^6$  CFU/ml) resistant to nitrofurantoin, norfloxacin, ciprofloxacin and trimethoprim/sulfamethoxazole. In 2016, two diagnoses were positive with *E. coli* ( $40 \times 10^4$  CFU/ml) as etiological agent resistant to ceftriaxone, ciprofloxacin and imipenem. Stands out this second case, the continuity of the high colony counting of bacteria isolated from urine cultures diagnosed in transplanted patient and the results related to multidrug resistance.

## Discussion

Both cases make a point of the persistence of the infections diagnosed, as well as, diversity of microorganisms found and mainly, because the resistance profile presented by the microorganisms identified.

Case 1, highlights the diversity of etiologic agent identified in the urine culture of the patient, and especially the quantity of antibiotics tested which the infectious agents showed high resistance. In case 2,

there was a persistence of the same infection over the years, which could not be eliminated easily in the post-transplant period.

Concluded from these reports, the relevance of monitoring infections, that occurs in the post kidney transplant period, in attempt to avoid complications to the transplanted organ. It was noticed, the significant resistance profile of microorganisms found to the tested antibiotics, indicating concern about the safe and effective use of antibiotics, frequently used in the treatment of urinary tract infection by kidney transplant patients. The urine culture and the antibiogram method, are an essential tool to the diagnosis of urinary infections [8], pointing the microorganism and the antibiotic response profile that has efficacy on the treatment of urinary tract infection faced by kidney transplant patients.

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