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Transplantation of a kidney from a donor with vancomycin-resistant *Enterococci*

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The colonization of vancomycin-resistant *Enterococci* before and after solid organ transplantation is associated with an increased risk of its infection. The prevalence of these bacterial colonies in renal transplant recipients are as high as that in intensive care unit patients. However, it is unclear whether donors with vancomycin-resistant *Enterococci* colonization can be considered in renal transplantation. Herein, we report a case wherein a kidney was transplanted from a deceased donor with vancomycin-resistant *Enterococci* colonies in urine and rectal swab. After transplant, the recipient had no vancomycin-resistant *Enterococci* infection and maintained relatively good renal function.

Keywords: Kidney transplantation; Vancomycin; *Enterococcus*

INTRODUCTION

Vancomycin-resistant *Enterococcus* (VRE) was first isolated in 1986, and was recently identified as a leading cause of nosocomial infection [1]. VRE colonization before and after solid organ transplantation is associated with an increased risk of VRE infection and has been found to be an independent risk factor for VRE bacteremia in several studies [2,3]. The mortality rate due to VRE bacteremia is reportedly as high as 46% in transplantation patients [4]. However, no previous reports describe a case wherein kidney was transplanted from a donor with VRE colonization. Here, we describe a case of kidney transplantation wherein the organ was taken from a deceased-donor with VRE colonization.

CASE REPORT

A 66-year-old man was admitted to our hospital due to mental deterioration, and intraventricular hemorrhage was detected. Then, the patient underwent urgent placement of an external ventricular drain and started receiving mechanical ventilation therapy. The guardian decided to donate the patient's organs including kidneys on day 25 of admission. At that time, the blood urea nitrogen and serum creatinine concentrations were 25 mg/dL and 1.0 mg/dL, respectively. The patient had pneumonia, and the serum concentration of C-reactive protein was 38 mg/dL (reference <0.3 mg/dL). His tracheal aspiration showed *Acinetobacter baumannii* susceptible to ampicillin/sulbactam, piperacillin and imipenem. He had received piperacillin/tazobactam for 14 days. We also detected vancomycin resistant *Enterococcus faecium* in urine culture and rectal swab (Table 1). However, no organism was detected in blood cultures. After transplantation was decided, we

HIGHLIGHTS

- Organ shortage is one of the major limitations to the development of kidney transplantation.
- Transplantation from donor with vancomycin-resistant *Enterococci* is safe.

Table 1. Antimicrobial susceptibility of *Enterococcus faecium* isolated from urine

Antibiotics	Susceptibility	MIC (ug/mL)
Penicillin	R	≥64
Ampicillin	R	≥2
Gentamicin (high-level resistance)		SYN-R
Streptomycin (high-level resistance)		SYN-S
Ciprofloxacin	R	≥8
Quinupristin/dafopristin	S	0.5
Linezolid	S	2
Teicoplanin	S	1
Vancomycin	R	≥32

MIC, minimum inhibitory concentration; R, resistant; S, susceptible; SYN, synergy.

administered linezolid for 2 days before operation. This study was approved by the Institutional Review Board of the Presbyterian Medical Center, Jeonju, Korea (IRB No. E2020-028).

A 52-year-old man received kidney from the deceased donor. He had been on continuous ambulatory peritoneal dialysis for 13 years with original disease of hypertension. After transplantation, his immunosuppressive treatments consisted of induction with basiliximab and a maintenance regimen with tacrolimus, mycophenolate mofetil, and prednisolone. The serum creatinine concentration decreased to 1.4 mg/dL during admission period. The patient discharged on day 20 without any signs of infection. Moreover, VRE was not detected in repeated urine culture and rectal swab during the hospitalization period. At the 3-month follow-up after transplantation, pyuria was not observed in urinary analysis.

DISCUSSION

Enterococci are one of the most common isolated species causing nosocomial blood stream infections in intensive

care unit [1]. Treatment of enterococcal blood stream infections has become more difficult due to the increase of multidrug resistance. VRE prevalence has increased worldwide, so VRE infections are an important cause of hospital-acquired infections globally [5]. The prevalence of VRE colonization in renal transplant recipients was 13.6%, which was as high as those reported for other high-risk groups such as hemodialysis patients [6]. The clinical significance of VRE colonization in hematopoietic stem cell transplantation (HSCT) is controversial. Zirkazadeh et al. [7] reported that pretransplant VRE colonization is associated with an increase in HSCT mortality, whereas VRE colonization on a prior admission was not an independent risk factor for bacteremia in a study reported by Kang et al. [8]. However, very few studies investigated whether donors with VRE colonization are suitable for solid organ transplantation, including kidney transplantation. In our case, VRE was detected in urine culture and rectal swab during hospitalization before organ donation. To our knowledge, this is the first report of using the kidney of a donor with VRE colonization in transplantation.

Recently, there is an increasing number of renal transplantation using deceased donor with infectious risk such as hepatitis C virus and human immunodeficiency virus [9]. However, there is no guideline on whether organs from donors with VRE are acceptable in renal transplantation. The inflammatory markers including C-reactive protein were elevated in this case just before transplantation. Besides pneumonia, the patient might have concomitant urinary tract infection (UTI) due to VRE since the patient had several risk factors of VRE-associated UTI such as sex and indwelling catheter [10]. However, it is not easy for clinicians to differentiate between VRE-associated urinary colonization, asymptomatic bacteriuria, and UTIs [11]. Therefore, we administered linezolid for 2 days after the donation was decided. Considering urgent clinical circumstance of transplantation using deceased donor, transplantation can be performed before the results of donor culture. Therefore, it is essential to check the donor culture results even after transplantation since the transmission of VRE from donor to recipient is possible [12,13]. Because the number of solid organ transplantations using organs from donors with VRE colonization may increase, it is needed to assess this issue and establish guidelines about regarding the use of organs from such donors.

In summary, herein, we report a case wherein a kidney was transplanted from a deceased donor with VRE colonies in urine and rectal swab. After transplantation, VRE

was not detected in recipient's urine and rectal swab.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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