Isolation of Fungi From Urine and Dialysis Filter in Patients on Hemodialysis in Dialysis Centers of Ahvaz, Iran

IJKD 2009;3:174-9
www.ijkd.org

SIR,

Patients with kidney failure who are on maintenance hemodialysis are more frequently at risk of opportunistic fungal infections. Infection is the most common cause of death in patients with acute kidney failure.[1,2] These patients have also limited urinary excretion that makes them susceptible to infectious diseases. One of the major causes of morbidity and mortality in patients undergoing hemodialysis is candidemia.[3] We identified infected in dialysis filters by fungi and assessed candiduria in patients on hemodialysis at our centers in Ahvaz, Iran. Urine samples of 74 patients were collected and immediately transferred to medical mycology laboratory. Then microliters of each sample were cultured on CHROMAgar *Candida* plates (CHROMAgar Candida Co, Paris, France) and incubated at 37°C for 1 week in an aerobic environment. In addition, 101 dialysis filters used for a session of hemodialysis were sampled. Positive urine cultures for *Candida* species were yielded in 3 patients (4.1%). The isolated species were *C albicans* (1700 CFU/mL), *C glabrata* (600 CFU/mL), and *C tropicalis* (3600 CFU/mL). Four of the of dialysis filters (4.0%) were contaminated by *Penicillium*, *Aspergillus niger*, *A flavus*, and *Rhizopus*.

Zaini and colleagues believe that even 1 colony of *Candida* in urine culture of men is considerable and should be taken seriously by clinicians.[4] The most common risk factors of candiduria are urinary indwelling catheters, antibiotics therapy, elderly age, urogenital tract abnormality, and diabetes mellitus. Kathresal and coworkers reported a case of arthritis due to *C albicans* in a patient on hemodialysis.[5] Wang and Line described a case of disseminated trichosporonosis in a patient on maintenance hemodialysis.[6] Drozdowska isolated several species of *C albicans*, *C glabrata*, and *C tropicalis* from urine in patients on hemodialysis.[7] Arvanitidou and colleagues isolated *Aspergillus* and *Penicillium* species, as well as *Candida* from the feed water, treated water, and dialysis solution samples.[8] Filters, tanks, and taps are favorable environments for fungi growth and are suitable sites for biofilm formation. The presence of fungi in treated water can contaminate dialysis filters as well as blood during hemodialysis. In the present study, 4% of filters were contaminated by saprophytic fungi. Probably, this contamination originates from treated water or dialysis solution. In conclusion, the recovery of saprophytic fungi from dialysis filters implies a potential risk for patients on hemodialysis. Further studies on fungi in feed water, treated water, and dialysis solution are required to investigate their clinical significance. In addition, candiduria in patients on hemodialysis needs to be discussed as a risk for these patients.

Ali Zarei Mahmoudabadi,[1]
Heshmatolla Shahbazyan,[2]
Maryam Zahiry[3]

[1]Department of Medical Mycoparasitology, School of Medicine and Infectious Diseases and Tropical Research Centre, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[2]Department of Internal Medicine, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[3]School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
E-mail: zarei40@hotmail.com

REFERENCES

1. Onder AM, Chandar J, Coakley S, Abitbol C, Montane B, Zilleruelo G. Predictors and outcome of catheter-related bacteremia in children on chronic hemodialysis. Pediatr Nephrol. 2006;21:1452-8.
2. Farinas MC, Garcia-Palomo JD, Gutierrez-Cuadra M. [Infection associated with hemodialysis and peritoneal dialysis catheters]. Enferm Infecc Microbiol Clin. 2008;26:518-26. Spanish.
3. Pyrgos V, Ratanavanich K, Donegan N, Veis J, Walsh TJ, Shoham S. Candida bloodstream infections in hemodialysis recipients. Med Mycol. 20081-5.
4. Zaini F, Azordegan F, Chabavizadeh J. Study of fungal infection in urine. Iran J Public Health. 1993;22:13-31.
5. Kathresal A, Biundo J, Blais CM, Morse S, Reisin E. A rare

case of Candida arthritis in a hemodialysis patient. Am J Med Sci. 2008;336:437-40.

6. Wang HY, Lin JL. Trichosporon beigelii fungaemia in a patient with haemodialysis. Nephrol Dial Transplant. 1999;14:2017-8.
7. Drozdowska A. [Morphological and biochemical features of fungi isolated from patients with renal failure]. Wiad Parazytol. 2007;53:145-8. Polish.
8. Arvanitidou M, Spaia S, Velegraki A, et al. High level of recovery of fungi from water and dialysate in haemodialysis units. J Hosp Infect. 2000;45:225-30.

Swine Influenza
Nephrologist's Perspective

SIR,

Swine influenza is caused by influenza A virus (H1N1) and is normally found in pigs. It is believed that antigenic shift has taken place in the virus, creating a new strain that has enabled the virus to infect humans and spread from person to person, leading to a pandemic.[1] Since immunocompromised patients are more prone to develop severe manifestations of this virus, nephrologists around the world need to be more cautious. Kidney transplant recipients and patients with chronic kidney disease could be a highly susceptible group. Preventive measures for community such as frequent hand washing are also applicable to this group. Social distancing is another tactic. Also, the two neuraminidase inhibitors, oseltamivir and zanamivir, are active against H1N1 strains, which would be prescribed to patients with a kidney allograft and those with chronic kidney disease in the pandemic situation. Thus, nephrologists and healthcare personnel need to know their dosage adjustments.

Oseltamivir is recommended by the Center for Disease Control and Prevention for both treatment and prophylaxis of H1N1 infection. The recommended dose in adults with normal kidney function is 75 mg, twice a day for 5 days, for curative treatment and 75 mg, once a day, for prevention. It is converted by hepatic esterases to its active metabolite, oseltamivir carboxylate. Neither oseltamivir nor oseltamivir carboxylate are substrates for, or inhibitors of, cytochrome P450 isoforms. Renal elimination of oseltamivir carboxylate accounts for more than 99% of the administered dose. Renal clearance occurs through both glomerular filtration and tubular secretion.[2] Therefore, it is necessary to adjust dosage in patients with kidney dysfunction (Table).

An open-label multiple-dose study was done to assess the pharmacokinetics and tolerability of oseltamivir in patients with end-stage renal failure undergoing maintenance hemodialysis and continuous ambulatory peritoneal dialysis (CAPD).[3] The patients received 30 mg of oral oseltamivir suspension over 6.5 weeks. The patients on hemodialysis received 9 doses given 1 hour after the completion of alternate hemodialysis sessions (3 times a week). The patients on CAPD received 6 doses given once weekly after a dialysis solution exchange. In the patients on hemodialysis, the peak plasma concentrations for oseltamivir carboxylate after single and repeated dosing were 943 ng/mL and 1120 ng/mL, respectively. The mean area under curve was 31 600 ng.h/mL for days 1 to 5. Similarly, in patients on CAPD, the mean peak plasma concentrations after the first and sixth doses were 885 ng/mL and 849 ng/mL, respectively. The mean area under curve values for days 1 to 6

Therapeutic Dosage Schedule of Oseltamivir and Zanamivir in Patients With Kidney Failure and in Kidney Transplant Recipients

Patient Status	Oseltamivir	Zanamivir
Glomerular filtration rate, mL/min		
> 30	75 mg twice daily	10 mg twice daily
15 to 30	75 mg once a day	10 mg twice daily
Hemodialysis	30 mg after alternate dialysis sessions	10 mg twice daily
Peritoneal dialysis	30 mg once a week after dialysis solution exchange	10 mg twice daily
Kidney transplant	According to glomerular filtration rate	10 mg twice daily