

# Unveiling the emerging of fluconazole-resistant *Candida albicans* in preterm with acute kidney injury: a growing challenge at Vajira hospital

## Abstract

This case presents a challenging scenario in a preterm female newborn born at 25 weeks gestation, who developed respiratory distress syndrome, followed by pneumonia, sepsis, subsequent renal complications, and *Candida albicans* infection. Despite initial susceptibility to fluconazole, the emergence of fluconazole-resistant *Candida albicans* led to a shift in antifungal treatment to amphotericin B in an acute kidney injury neonate. This case underscores the growing concern of drug-resistant *Candida albicans* in neonates, highlighting the importance of judicious selection of empirical antifungal therapy and comprehensive management strategies, especially in the context of acute kidney injury.

**Keywords:** fungus, drug-resistant, neonate, fluconazole, candida, albicans

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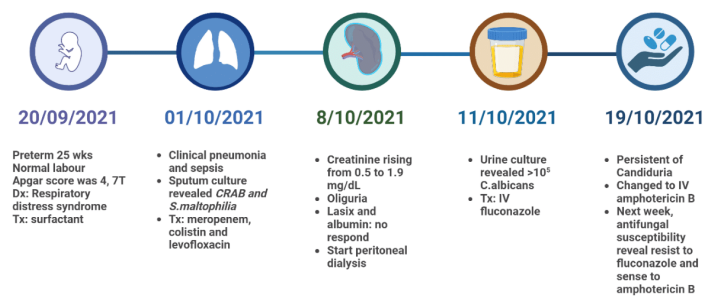
## Blinded manuscript

A preterm female newborn with a gestational age of 25 weeks. Her birth weight was 650 grams. She was diagnosed with respiratory distress syndrome. On the 30th day of life, the patient developed pneumonia with sepsis. Subsequent sputum analysis identified the carbapenem-resistant *Acinetobacter baumannii* and *Stenotrophomonas maltophilia*. Treatment was initiated with meropenem, colistin, and levofloxacin. After one week, the patient's creatinine levels began to rise, accompanied by oliguria, likely due to ischemic acute tubular necrosis and the nephrotoxic effects of multiple medications. Peritoneal dialysis was performed. Simultaneously, she still had fever and thrombocytopenia, and a urine culture revealed a count of  $>10^5$  *Candida albicans*. Considering that *C. albicans* had previously shown full susceptibility to fluconazole, intravenous fluconazole was initiated

as an antifungal treatment. Despite receiving fluconazole treatment for one week, subsequent urine cultures continued to show the presence of *C. albicans*. The patient underwent abdominal, head ultrasonography, echocardiography, and retinal examinations, all of which showed no evidence of candida infection. Consequently, fluconazole-resistant *C. albicans* was considered the primary differential diagnosis, and the treatment was switched to intravenous amphotericin B. After three days, urine cultures no longer detected any organisms. Subsequently, the drug susceptibility test for *C. albicans* revealed a minimum inhibitory concentration (MIC) of 4 µg/mL for fluconazole and 0.5 µg/mL for amphotericin B. In this case, intravenous amphotericin B was continued for 14 days after the absence of any growth in the urine culture. Additionally, the patient underwent peritoneal dialysis for one month (Figure 1).

## Timeline

Summary  
Clinical course



**Figure 1** The timeline of clinical course.

*Candida* infections are common in neonates, infants, and children, with invasive candidiasis posing a significant challenge, and candiduria in newborns must be investigated and treated.<sup>1</sup> This is especially true for extremely low birth weight infants, where the incidence is approximately 5.5%,<sup>2</sup> and the all-cause mortality rate during the neonatal period ranges from 14.4%.<sup>3</sup> *Candida albicans* remains the most prevalent species in neonates and children.<sup>1</sup> Notably, *C. albicans* has shown susceptibility to fluconazole, with a reported susceptibility rate of 86-99% minimum inhibitory concentration (MIC) testing.<sup>4,5</sup> However, we have encountered a concerning issue of fluconazole resistance in *C. albicans* within the neonatal intensive care unit. Therefore, when dealing with severe invasive candidiasis, it is essential to carefully consider the choice of empirical antifungal treatment in the future. This case highlights the emergence of drug-resistant *Candida albicans*. Accurate microbial susceptibility testing and a multidisciplinary approach are important.

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### Ethical approval

Ethics approval and consent from Institutional Review Board Faculty of Medicine Vajira Hospital. (COE: 019/2023X).

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### Conflicts of interest

The authors declare that there are no conflicts of interest.

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