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## CASE REPORT

### Rare Case: CNS Candidiasis with CKD in Neonate

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#### Abstract

**Background:** Candida infections are a common cause of mortality and morbidity in NICU. 70% of neonates with systemic fungal infection develop brain abscess. Candidiasis can involve the renal cortex resulting in impairment of renal function. **Clinical Description:** A neonate presented with features of severe dehydration on Day 16 of life with chief complaints of loose stool and vomiting, weight loss was of 24% Baby was exclusively breastfed. Lab inv was s/o severe metabolic acidosis with raised urea and creatinine. MRI Brain s/o fungal abscess. USG KUB s/o B/L small shrunken Echogenic Kidney so a diagnosis of CKD was made. **Management:** Baby was mechanically ventilated due to respiratory distress and FFP transfusion was given due to deranged PT/INR and inotropes were started. Dehydration and sodium bicarbonate correction was given. Antibiotics were started Antifungals (Amphotericin B and Fluconazole were started). **Conclusion:** Candida albicans is the most common fungal infection that is seen among late onset fungal sepsis. In disseminated Candidiasis, kidneys are most commonly involved followed by brain. Thus, becomes very crucial to have an early diagnosis of disseminated candidiasis for better prognosis.

**Keywords:** Candida albicans, Disseminated Candidiasis, CKD, Fungal Abscess

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### **Defining CKD in Neonate**

Chronic Kidney Disease (CKD) can affect all irrespective of age, gender and ethnicity. But there are certain differences in definition of CKD in neonates. Specifically, the criterion established by KDOQI (Kidney Disease Outcomes Quality Initiative) [1] and expanded by KDIGO (Kidney Disease: Improving Global Outcomes) [2] that the 3 months duration of kidney disease is not applicable to neonates. The diagnosis of CKD in the neonatal period is typically made a prior on the basis of renal USG. Firstly done in the prenatal period and repeated soon after birth, reveals altered renal architecture or a significant urological abnormality with abnormal kidney functions. Neonates may develop AKI shortly after birth because of perinatal asphyxia, hypoxia, sepsis, or hypovolemia also have long-standing kidney damage and eventually develop CKD. The most common etiologies are renal hypoplasia/dysplasia, posterior urethral valves [3], and other congenital anomalies of the kidney and urinary tract including polycystic kidney disease, cortical necrosis, and renal vascular thrombosis. Wedekin and colleagues [4] estimated a CKD incidence of 1:10,000 in a single center retrospective analysis of infants younger than 1 year with a serum creatinine level greater than 1.13 mg/dL (100 mmol/L), gender distribution (male-to-female ratio of 2.8) was expected because of the male dominated contribution of obstructive uropathy (e.g, posterior urethral valves) as a common cause of CKD.

### **Candidal Brain Abscess**

Brain abscess is a focal pyogenic infection of the brain parenchyma. Fungal brain abscesses are relatively less frequent. Various risk factors contributing to fungal brain abscess include LBW, Prematurity, Immunodeficiency states, Prolonged ICU

stay and prolonged ventilation, Extensive use of broad-spectrum antibiotics, and Sepsis [5]. Candida species are most common cause of nosocomial fungal infection in NICUs. Systemic fungal sepsis in a neonate is usually caused by Candida species, albicans being the most common [6]. According to global data in pediatric brain abscess reports fungal infection contributes to 20% cases with a very high mortality of almost 80% [7]. Indian data shows a prevalence of < 1% [8]. Most common pathogen responsible for brain abscess in a neonate is Gram-negative bacilli [9,10]. We present a case report of an extremely rare cause for cerebral abscess in a neonate and how timely and appropriate intervention resulted in a favorable outcome.

### **Case Report**

A neonate born at term gestation with birth weight of 3 kgs presented with features of severe dehydration on Day 16 of life with chief complaints of loose stool and vomiting, weight loss was of 24%. Baby was exclusively breastfed. Lab investigations were suggestive of severe metabolic acidosis with raised urea and creatinine (urea 263; creat 2.87). During hospital stay, baby was mechanically ventilated due to respiratory distress after 15 hours of admission. The baby was extubated and put on CPAP and FFP transfusion was given due to deranged PT/INR and Inotropes were started. Dehydration and sodium bicarbonate correction was given. Antibiotics were started. Baby had 1 episode of seizure in form of cyclical movement of both limbs and Chewing movements, Phenobarbitone was started.

CSF analysis was done which showed raised protein (166 mg%). Urine output was adequate. Repeat KFT (Urea 186; creat-1.96) with metabolic acidosis (Ph-7.25; HCO<sub>3</sub>-11.7). Ammonia, Lactate and

urine for ketones was negative. Blood culture, Endotracheal culture, Pus culture were sterile. USG KUB showed echogenic kidney with maintained CMD with B/L pyelonephritis. Serial urine for fungal hyphae showed budding yeast cell. MRI Brain was s/o fungal abscess. Antifungal (Amphotericin B and Fluconazole were started).The baby went three times weight correction and sodium bicarbonate correction.

Lab parameters showed continuously raised urea (263-152) and creatinine (2.87-1.4) with persistent metabolic acidosis. Repeat USG KUB s/o B/L small shrunken Echogenic Kidney so a diagnosis of CKD was made on Day 50 of life. The baby was discharged on oral sodium bicarbonate, calcitriol, phenobarbitone and amphotericin B and fluconazole, on exclusive breastfeeding.

### **Conclusion**

Most of late onset fungal infections are caused by *Candida albicans*. The organs commonly involved are CNS, kidney and fundus. The renal systemic fungal infections have tendency to recur so they warrant a prolonged treatment with antifungals. The brain lesions described with candidiasis are focal infarctions, cerebritis, abscesses, and granulomas. Classically, cerebral

microabscesses are described in candida infections<sup>5</sup>.Cerebral microabscesses secondary to *C. albicans* have been described previously in preterm neonates<sup>11</sup>.Superinfection with *Candida* results from disturbances in equilibrium that normally exists within the intestinal flora, usually resulting from chemotherapy, antibiotic therapy and haematological abnormalities. In patients with disseminated *Candida* infections kidneys are the most commonly involved organs followed by brain. Intraparenchymal haemorrhage and thrombosis with infarction have also been described as consequences of cerebral candidiasis. Thus, it is very important to have an early diagnosis of disseminated candidiasis for early intervention and better prognosis.

### **Conflict of interest**

The authors declare that they have no competing interests.

### **Ethics approval, Consent to participate, Consent to publish, Availability of data and material, Code availability**

Not applicable

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