



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**CLINICAL SPECTRUM AND OUTCOME OF NEONATAL CANDIDIASIS IN A TERTIARY CARE HOSPITAL IN JHALAWAR, RAJASTHAN**

**KEY WORDS:** Candida, NICU, Outcome.

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**ABSTRACT**

**Background-** Candida colonization in neonates results in significant morbidity and mortality. This study aimed to study clinical spectrum and outcome of neonatal candidemia.  
**Methods-** The study was carried out in Special Newborn Care Unit and Neonatal intensive care unit Department of Pediatrics, Janana hospital Jhalawar Medical College & associated Hospital, Jhalawar.  
**Results:** 50 newborn patients who had a positive Candida blood culture. 19 (30.65%) were died. Candida species was a contributory factor to mortality in 12 (24.00%) patients. Among Candida isolates, *Candida albicans* was the commonest (70.00%) followed by *Candida parapsilosis* (20.00%) and *Candida glabrata* (10.00%).  
**Conclusions:** Candida species are assuming an increasing role in nosocomial infections in neonates and is associated with an increased risk of mortality.

**INTRODUCTION**

Neonatal sepsis is the second leading cause of death in neonates in our country and is responsible for almost a quarter of total neonatal deaths.<sup>1</sup> *Candida* species are the leading cause of invasive fungal infection in neonatal intensive care unit (NICU).<sup>2</sup>

A number of factors including the use of indwelling devices, broad-spectrum antibiotics, LBW, prematurity, total parenteral nutrition, gastrointestinal surgery, artificial ventilation, and/or history of fungal colonization contribute to the risk.<sup>3</sup>

Although *C. albicans* remains the most common fungal pathogen isolated from blood and body tissue, recent literature shows an increased prevalence of *non-candida* species.<sup>4,5</sup>

Systemic candidiasis lead more frequently to end-organ damage than other newborn infections and can involve kidneys, brain, lungs, eyes, liver spleen, bones, and joints.<sup>6</sup>

Among *Candida* species, *C. albicans* is the most prominent pathogen in neonates; however, the incidence of cases due to *C. parapsilosis* accounts for ~25% of invasive candidiasis in VLBW infants.<sup>7</sup> *C. glabrata* and *C. krusei*, recognized for their resistance to azoles, are of less concern in the NICU.<sup>8</sup> Consequences of Invasive Candidiasis in neonatal population are severe with 14–40% mortality and 30–70% neuro developmental impairment (NDI) among survivors.<sup>8,10,11,12</sup> The present study was conducted to understand the clinical spectrum and outcome of neonates with invasive neonatal candidiasis in a tertiary care hospital in Jhalawar, Rajasthan

**MATERIAL & METHODS**

**STUDY POPULATION**

The study was carried out in Special Newborn Care Unit and Neonatal intensive care unit Department of Pediatrics, Janana hospital Jhalawar Medical College & associated Hospital, Jhalawar.

The criteria used for diagnosing invasive neonatal candidiasis is

A positive blood culture and/or CSF culture and/or urine culture by suprapubic tap of pure growth of *Candida* species with clinical features supportive of *Candida* sepsis

**INCLUSION CRITERIA:**

1. All neonates with birth weight less than 1.5kg.
2. Neonates who develop signs and symptoms of sepsis which include temperature instability, refusal of feeds, worsening of respiratory distress, abdominal distension, apnea, lethargy, bradycardia, decreased perfusion, or seizures during ICU stay.

**EXCLUSION CRITERIA:**

Not willing to participate in the study

**SAMPLING TECHNIQUE:**

Simple random sampling.

**SAMPLE SIZE:**

All neonates who fulfill the inclusion criteria admitted in Shreemati Heera Kunwar Baa Mahila Hospital, Jhalawar during the study period.

**STUDY PERIOD:**

3 months

**STUDY DESIGN :**

Prospective observational study.

**SOURCES OF DATA:**

Neonates admitted with features of systemic candidiasis admitted in Shreemati Heera Kunwar Baa Mahila Hospital, Jhalawar

**METHOD & COLLECTION OF DATA:**

1. All babies with birth weight less than 1.5kg either in NICU or SNCU was taken for the study.
2. All babies with features suggestive of invasive candidiasis admitted either in NICU or SNCU fulfilling the inclusion criteria was taken for the study.
3. Babies were treated according to the standard protocol.
4. In all cases, routine investigations like complete blood counts was done. Septic work up with CRP and blood culture was done.
5. Radiological assessment was undertaken with X-rays as directed by the condition.
6. Formetabolic disturbances with blood glucose, serum calcium, electrolytes, investigations were done and interpreted when required.

**STATISTICAL ANALYSIS :**

Statistical analysis will be done by SPSS software (20.0 trial version ) and appropriate statistical tests were used for finding the final results.

**RESULTS**

Among *Candida* isolates, *Candida albicans* was the commonest (70.00%) followed by *Candida parapsilosis* (20.00%) and *Candida glabrata* (10.00%).

**Table 1. Demographical and clinical profile of patients**

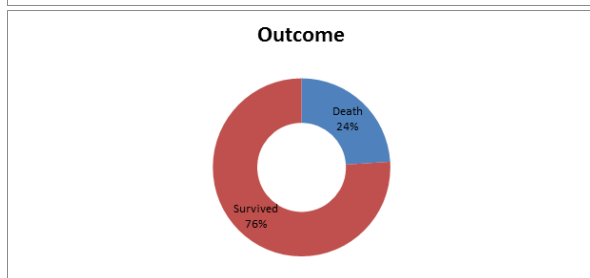
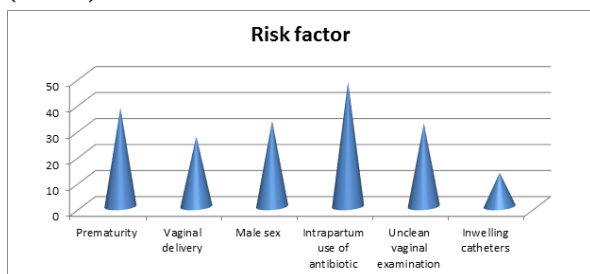
Variable	No of cases	Percentage
Sex	Male	33
	Female	17
Weight in gm	1320.12123.96	
Mode of delivery	LSCS	23
	NVD	27
Lethargy	36	72.00
Abdominal distention/gastric aspirates	21	42.00
Thrombocytopenia	19	38.00
Failure to thrive	34	68.00
Respiratory distress syndrome	11	22.00
Jaundice	13	26.00
Birth asphyxia	22	44.00
Tachycardia	12	24.00

Most common clinical presentation of culture positive neonates were lethargy (72.00%) followed by failure to thrive (68.00%) and birth asphyxia(44.00%)

**Table 2. Risk factor**

Risk factor	No of cases	Percentage
Prematurity	38	76.00
Vaginal delivery	27	54.00
Male sex	33	66.00
Intrapartum use of antibiotic	48	96.00
Unclean vaginal examination	32	64.00
Inwelling catheters	13	26.00

This table shows that the risk factors identified, intrapartum use of antibiotics (96.00%) followed by vaginal delivery (54.00%).



**DISCUSSION**

In the NICUs infection with unusual organisms is an increasing problem. Due to advances in medical and surgical management an increase in nosocomial fungal infection rate has been observed. Newborns admitted to intensive care units are at greater risk of contracting nosocomial infections. These risks are associated with their susceptibility to infections as a result of both prematurity and invasive medical equipment needed for survival. Rates of *Candida* bloodstream infections have increased dramatically during the past decade, in part related to the improvement in survival rates of infants with VLBWs.<sup>12</sup>

In the present study *C. albicans* was responsible for 70.00% of cases of the of neonatal candidemia whereas nonalbicans *Candida* (NAC species) accounted for 30.00%. This corroborates well with the results of other authors.<sup>13,14</sup>

Most of the clinical characteristics of candidemia in this study were similar to previous publications. However, it was identified here that the finding of birth asphyxia, respiratory distress syndrome, failure to thrive, and lethargy were more common clinical feature in neonates who died. Use of multiple invasive devices, such as catheters and endotracheal tubes may be responsible for the nosocomial spread of pathogens through the hands of HCW. The hands of HCW and environmental surfaces are newly-appreciated potential reservoirs for nosocomial strains of *Candida*.

Even though candidemia has been associated with prolonged hospitalization, most fatal cases occurred in neonates younger than 3 weeks of age.<sup>11</sup> Given that infants of this age have decreased immunity, their host response to *Candida* may contribute to mortality.<sup>12</sup> The mortality rate associated with these infections is 20–50% and occurs among all the ages. In this study, the mortality rate was 30.65%.

**CONCLUSION**

*Candida* species are assuming an increasing role in nosocomial infections in neonates and is associated with an increased risk of mortality.

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