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Original Research

Evaluation of Bacterial & Fungal Sepsis in Neonates

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***ABSTRACT*:**

Introduction: Neonatal sepsis is an important cause of neonatal morbidity and mortality. The present study was conducted to assess bacterial & fungal sepsis in neonates. **Materials & Methods:** The present study was conducted in the department of Pediatrics on 88 cases. In all cases, bacteriological and fungal profile of babies was assessed. **Results:** Out of 88 isolates, Staphylococcus aureus was the most common organism isolated accounting for about one third of the cases and second most common being Klebsiella (25%). Other organism like Pseudomonas and Escherichia Coli were uncommon. As expected there is difference in spectrum of organisms in inborn and outborn babies. Among inborn babies Klebsiella isolates exceed Staphylococci (30% vs. 21%), whereas in outborn babies staphylococci were more common as compared to Klebsiella (41% vs. 20%). Candida albicans was more common in 7 inborn babies and in 3 outborn babies. Non albicans was seen in 3 inborn babies and in 4 outborn babies. The difference was non- significant (P> 0.05).

Conclusion: Authors found that the commonly encountered bacteria were Staphylococci aureus and fungus was Candida Albicans.

Key words: Candida albicans, Neonatal sepsis, Staphylococcus aureus.

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INTRODUCTION

Neonatal sepsis is described as a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first month of life. It encompasses various systemic infections of the newborn such as septicemia, meningitis, pneumonia, arthritis, osteomyelitis, and urinary tract infections. The common causes of neonatal mortality are different types of infections (32%) like septicemia, meningitis, respiratory infections, diarrhoea, neonatal tetanus followed by birth asphyxia and injuries (29%) and prematurity (24%).[1]

Advances in neonatal management have led to considerable improvement in newborn survival. However, early (<72 hour) and late (>72 hour) onset systemic infections, both bacterial and fungal, remain a devastating complication and an important cause of morbidity and mortality in these babies. Systemic fungal infections, previously considered to be a rare complication, occur in as many as 5% of low-birth-weight babies. They are even more frequently diagnosed in very low-birth-weight babies (VLBW) receiving intensive care. About 20% of babies weighing less than 1000 g develop invasive fungal infections.[2]

About 20% of the babies weighing less than 1000 g develop invasive candidiasis. Mortality rate is also quite high among neonates with disseminated fungal infection, often approaching 50%3. The increasing use of prophylactic antifungal agents to prevent Candida infections has led to emergence of resistant species. As most of the studies about the epidemiology and risk factors association of the blood stream infection due to candida species are retrospective.[3] The present study was conducted to evaluate bacterial & fungal sepsis in neonates.

MATERIALS & METHODS

The present study was conducted in the department of Pediatrics. It comprised of 88 pediatric admissions to the department. The study protocol was approved from institutional ethical committee.

General information such as name, age, gender etc. was recorded. Standard procedures were followed for sample collection. An area of approximately 5 cm over the venipuncture site was disinfected with 70% alcohol rubbed thoroughly and allowed to dry. This was followed by application of povidine Iodine in concentric circles over the site and allowed to dry for at least 1 minute. About 2 ml of blood was drawn using a sterile syringe and inoculated aseptically into a culture bottle containing 5 to 10 ml of culture media. P value less than 0.05 was considered significant.

Table I Bacterial Profile of cases

Organism	Inborn (47)	Outborn (41)	P value
S. aureus	10	17	0.04
K. pneumonia	14	8	0.26
CONS	7	7	0.78
Acinetobacter	2	0	0.18
E. Coli	1	1	0.92
Pseudomonas	1	1	0.92
Providencia	1	0	0.34
Enterococci	1	0	0.34

Table I, graph I shows that out of 88 isolates, Staphylococcus aureus was the most common organism isolated accounting for about one third of the cases, second most common being Klebsiella (25%). Other organism like Pseudomonas and Escherichia Coli were uncommon. As expected there is difference in spectrum of organisms in inborn and outborn babies. Among inborn babies Klebsiella isolates exceed Staphylococci (30% vs. 21%), whereas in outborn babies staphylococci were more common as compared to Klebsiella (41% vs. 20%).

Graph I Bacterial Profile of cases

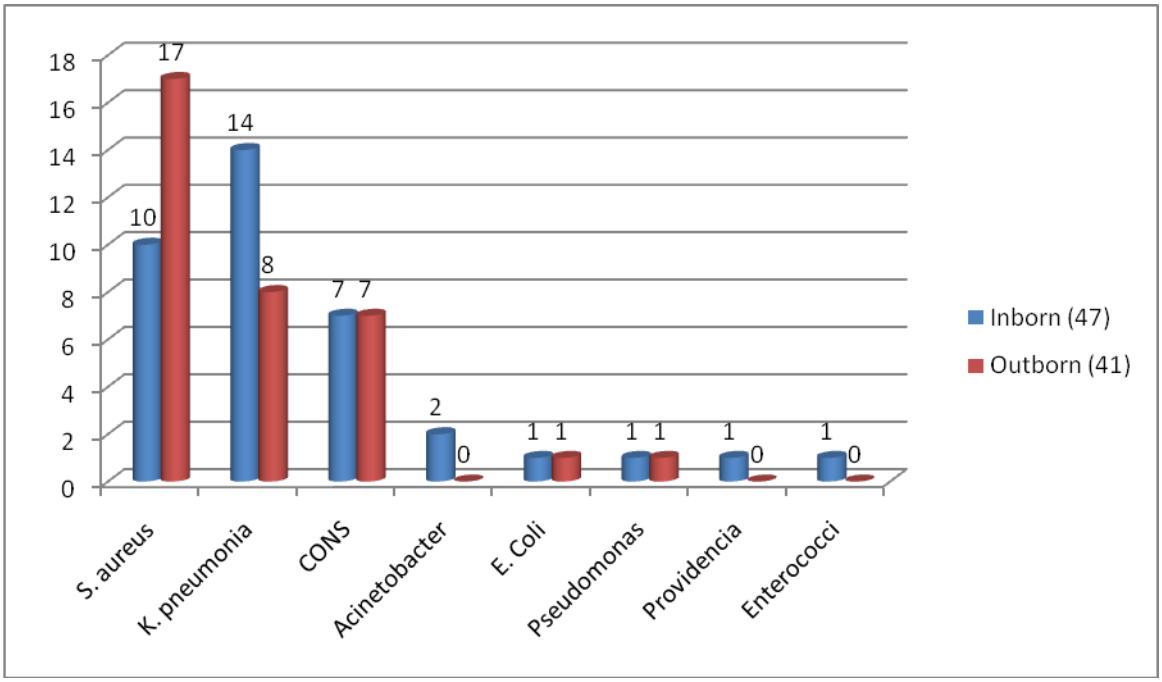
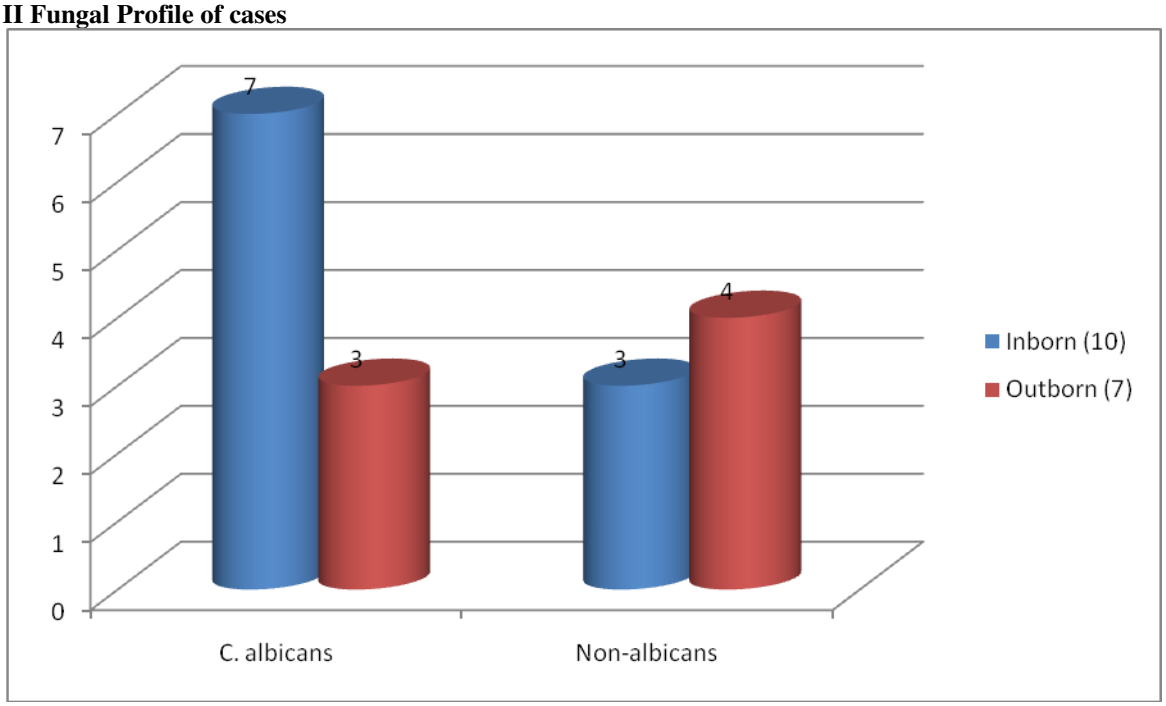


Table II Fungal Profile of cases

Organism	Inborn (10)	Outborn (7)	P value
C. albicans	7	3	0.26
Non-albicans	3	4	0.56

Table II shows that Candida albicans was more common in 7 inborn babies and in 3 outborn babies. Non albicans was seen in 3 inborn babies and in 4 outborn babies. The difference was non- significant (P> 0.05).

Graph II Fungal Profile of cases



DISCUSSION

Immature host defense mechanisms and invasive life support systems make the premature neonate particularly susceptible to overwhelming infection. Approximately 20% of very low- birth-weight (VLBW) (birth weight <1,500 g) preterm infants experience a serious systemic infection during their initial hospital stay.[4] While advances in neonatal intensive care have resulted in improved survival of preterm infants, mortality is as much as threefold higher for VLBW infants who develop sepsis than for those without sepsis. In fact, sepsis accounts for approximately half of all deaths beyond the second week of life in VLBW infants.[5] While the past decade has been marked by a significant decline in early-onset group B streptococcal (GBS) sepsis in both term and preterm neonates, the overall incidence of early-onset sepsis has not decreased in many centers, and several studies have found an increase in sepsis due to gram-negative organisms.[6] The present study was conducted to assess bacterial & fungal sepsis in neonates.

In this study, we found that Staphylococcus aureus was the most common organism isolated accounting for about one third of the cases, second most common being Klebsiella (25%). Other organism like Pseudomonas and Escherichia Coli were uncommon. As expected there is difference in spectrum of organisms in inborn and outborn babies. Among inborn babies Klebsiella isolates exceed Staphylococci (30% vs. 21%), whereas in outborn babies staphylococci were more common as compared to Klebsiella (41% vs. 20%). Desai et al[7] found that out of 92 neonates, 53 were male and 39 were female. Bad obstetric history (BOH) was present in 23 mothers. Low to very low birth weight was seen in more than two thirds culture positive neonates. All neonates (100%) had poor cry, sucking and reflex problems. 51(55.43%) were culture positive of which bacterial pathogens was detected in 27(52.94%) and fungal agents in 24 (47.05%) cases. Bacterial sepsis was predominantly caused by different gram negative organisms (66.66%). Klebsiella sp. and Staphylococcus sp. were the principal isolates. Candida was the commonest fungus reported. Klebsiella isolates were most sensitive to cefotaxime and amikacin while Staph. epidermidis isolates were sensitive to Amoxicillin clavulinic acid.

We observed that Candida albicans was more common in 7 inborn babies and in 3 outborn babies. Non albicans was seen in 3 inborn babies and in 4 outborn babies. Reported literatures showed bacteria as the main causative agent of neonatal septicemia. Among bacteria, gram negative organisms are shown to be more commonly involved etiological agents and Escherichia coli, Klebsiella, Pseudomonas and Salmonella sp. topped the chart whereas among the gram positive organisms, Staphylococcus aureus, coagulase negative staphylococci (CONS), Streptococcus pneumonia and Streptococcus pyogenes are the principal isolates. Septicemia due to fungal sepsis are attributed to long stay in hospital, multiple invasive procedures and inadvertent use of antibiotics.[8] Various types of Candida sp. are the most common fungal isolates though a few cases may be due to Malasseziasp. Classically, Candida albicans has been reported as the causative agent in half of the cases of fungal neonatal sepsis. Non-albicans Candida infections have become more frequent in last few years.[9] As a reason of insidious and nonspecific nature of presentation, neonatal sepsis is very

difficult to diagnose despite its high incidence, till date. Blood culture is still considered as the gold standard for the diagnosis of neonatal septicemia. Forty-one percent of all deaths every year in children below 5 years are due to deaths occurring in the neonatal period.[10] In developing countries, every year, one million of such deaths occur due to different infections including neonatal sepsis, meningitis and pneumonia.

CONCLUSION

Authors found that the commonly encountered bacteria were Staphylococci aureus and fungus was Candida Albicans.

REFERENCES

1. Zaidi AK, Huskins WC, Thaver D, Bhutta ZA, Abbas Z, Goldmann DA. Hospital-acquired neonatal infections in developing countries. Lancet. 2005; 365(9465):1175-88.
2. Rana U, Purani C, Patel P, Gupta K. Clinico-Bacteriological profile of neonatal sepsis in a tertiary care hospital. ARC J Pediatr 2016; 2(2): 1-8.
3. Isaacs D. Neonatal Sepsis: The Antibiotic Crisis. Indian Pediatrics. 2005; 42:9-13.
4. Laxminarayan R, Choudhury RR. Antibiotic Resistance in India: Drivers and Opportunities for action. PLoS Med 13(3): 1001974.
5. Murki S, Jonnala S, Mohammed F, Reddy A. Restriction of Cephalosporin and Control of ESBL producing Gram negative Bacteria in a Neonatal Intensive Care Unit. Indian Pediatr 2010; 47: 785-8.
6. Isaacs D. Neonatal Sepsis: The Antibiotic Crisis. Indian Pediatrics. 2005; 42:9-13.
7. Desai KJ, Malek SS, Parikh A. Neonatal septicemia: bacterial isolates and their antibiotic susceptibility patterns. Gujarat Medical J. 2011; 66(1): 13-5.
8. Benjamin DK, Stoll BJ, Gantz MG, Walsh MC, Sanchez PJ, Das A, et al. Neonatal Candidiasis: Epidemiology, Risk Factors, and Clinical Judgment. Pediatrics 2010;126:865–73.
9. Juyal D, Kotian S, Sangwan J, Rathaur V, Sharma N. Clinico-epidemiological profile, risk factors, and prognosis of neonatal candidemia due to Candida parapsilosis: An emerging threat to neonates. Int J Health Allied Sci. 2014;3:100.
10. Rao S, Ali U. Systemic fungal infections in neonates. J Postgrad Med. 2005;51:27.