



Prevalence of late onset sepsis in very low birth weight babies in a tertiary care hospital.

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ABSTRACT

Background: Late onset sepsis is one of the major cause of morbidity and mortality in very low birth weight babies. Late onset neonatal sepsis (LONS) includes systemic infection that occur beyond 48 hours of age. Very low birth weight babies (VLBW <1500 g birth weight) are at high risk for late onset sepsis.

Aim and Objective: The main aim and objective of this study was to determine the prevalence of LONS in VLBW babies.

Methods: An observational study was done in NICU of post graduate department of Pediatrics, G B Pant hospital, an associated hospital of GMC Srinagar from April 2014 to April 2015.

Results: Out of 240 selected patients, 85 suffered from late onset sepsis. The majority of these patients had at least 1 culture obtained during the first 3 days of life.

KEYWORDS : Late onset sepsis, Very low birth weight, mortality.

Introduction

Neonatal sepsis is a frequent complication of very low birth weight babies and it is one of the most important cause of morbidity and mortality (1,2). Neonates are deficient in both cellular and humoral immunity due to which they produce immunoglobulin at a lower rate than adults (3). Also bacterial colonization of the intestine in preterm infant may differ from that in healthy, breast fed term infants. In particular, exposure to postnatal antibiotic therapies, total parenteral nutrition, delayed enteral feeding and especially a delay in breast feeding, may impair the intestinal colonization of preterm infants in the neonatal intensive care (NICU) (4). This may favor the overgrowth of pathologic microorganisms, which can lead to sepsis (5, 6, 7). Twenty five percent of these infants have at least one or more positive blood cultures over the course of their hospitalization. Late onset sepsis is associated with an increased risk of death, neonatal morbidity and prolonged hospitalization (8). In 2009, the Australian and New Zealand Neonatal network reported late onset sepsis in 15.7% of infants born at <32 weeks and weighing <1500g (9). It was found that the most significant clinical findings for sepsis were presence of tachypnoea with grunting/chest retraction or apnoea, temperature instability and a capillary refill time of greater than 3 seconds. Of the laboratory tests, leukopenia (<4000 × 10⁹/L) or leukocytosis (>34,000 × 10⁹/L), C-reactive protein greater than 10 mg/dl and interleukin 8 value of greater than 70 pg/ml were the most important variables (10). The source of infection is either nosocomial or community acquired and neonates usually presents with septicemia, pneumonia, meningitis (11, 12). Various factors that predispose to an increased risk of nosocomial sepsis include NICU admissions, low birth weight, prematurity, invasive procedures, parenteral fluid therapy, ventilation, PICC insertion and use of vascular catheters. Factors that may increase the risk of community-acquired late onset sepsis include poor hygiene, poor cord care, bottle feeding and prelacteal feeds. Breast feeding on the other hand, prevents infection in neonates.

Material and Methods:

This is an observational study and was conducted in NICU of post graduate dept. of pediatrics, G B Pant hospital, GMC Srinagar over a time period of one year. After taking consent of the parents, patients were enrolled in the study.

Inclusion criteria was to enroll all the neonates of either gender in consecutive manner admitted in NICU with: 1.gestational age <37 weeks

2. birth weight ≤1500g

after taking proper consent from parents.

A total of 240 patients meeting the criteria were enrolled in the study. All VLBW infants admitted to the unit with a presumptive diagnosis of sepsis had a full sepsis screen, which includes blood culture, CSF culture, urine culture, CBC and chest x ray. Blood culture of all the patients was sent before the administration of antibiotics.

Results:

Over a period of one year, 240 VLBW infants were admitted to NICU. During their stay in NICU, 85/240 (35.41%) had one or more episodes of sepsis. Out of these 85 patients, 16 died and 69 survive.

Sex ratio of VLBW infants:

1. Male =45 (52.9%)
2. Female=40 (47.05%)

Acc. to their gestational age:

Late onset sepsis >72 hrs	Weight	Number	% (percent)
VLBW	<1500g	37	43.52
ELBW	<1000g	48	56.47

As birth weight increases, improvement occur. Out of these 85 patients, culture of 50(58.8%) patients were positive and 35 (41.17%) were negative. These 35 patients were suffered from culture negative sepsis. The vast majority of late onset infections were caused by gram-positive organisms. Coagulase negative staphylococcus were the most common late onset pathogens accounting for around 80% of all gram-positive infections in our unit. E.coli and pseudomonas were the most frequent gram - negative pathogens.

Discussion:

LONS constitutes a major cause of mortality and morbidity particularly in preterm infant. VLBW infants are at greatest risk of infection because of compromised immunity, prolonged hyperalimentation, CVC catheterization and mechanical ventilation. In our study, the vast majority of sepsis was LOS and CONS was the most common causative organism. These observations were also noted in other studies in united states and Israel (13, 14). Methods studied to prevent LONS include early feeding, immune globulin administration, prophylactic antibiotic administration and improved hand hygiene. Various measures had been taken to reduce LONS:

1. To expand the use of alcohol gel, which is preferred by professionals due to being easy to use and having comparable

- efficiency to other antiseptics, provided the hands are not soiled (15).
2. Have standardized procedures for insertion and maintenance of PICCs.
 3. Carry out regular meetings with infection control committee to monitor infection rate.
 4. Perform theoretical and practical training for hand hygiene for the entire health team.
 5. Efforts to initiate enteral feeding as early as possible.
 6. Avoid frequent use of invasive devices with those without infection.

Early feeding allows decreased use of total parenteral nutrition. Total parenteral feeding has been shown to have an immunosuppressive effect. Okada (16, 17) et al have shown that when it is administered for more than two weeks it impairs phagocytosis and killing of CONS and that introduction of small volumes of enteral feeding improved this finding. Therefore this study appears to suggest that feeding preterm infants earlier may help to reduce the risk of infection.

Conclusion:

The main conclusion of this study was that sepsis related mortality is very high in low birth weight infants specially extreme low birth weight infant. So focusing on various preventive strategies mention in this study would reduce LONS in VLBW.

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