INTERNATIONAL JOURNAL OF PAEDIATRICS AND GERIATRICS

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Assessment of neonatal septicemia cases in pediatric department

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Abstract
Background: Neonatal septicemia is the chief cause of morbidity and mortality in the neonatal period. The present study was conducted to assess neonatal septicemia cases in pediatric department.
Materials & Methods: The present study was conducted in department of Pediatrics. It comprised of 84 babies with gestational age >32 weeks and/or birth weight >1500 g. Babies were divided into 2 groups of 42 each. Group I received 7 days antibodies coverage and group II received 14 days. All were monitored for clinical signs and symptoms, blood cultures etc
Results: Gestation in weeks in group I was 35.4 and in group II was 35.2, birth weight was 2018.4 grams in group I and in group II was 1984.6 grams, early onset sepsis was seen in 16 in group I and 20 in group II, gram + organisms were seen in 15 in group I and 19 in group II and S. aureus was evident in 6 in group I and 8 in group II. There was treatment failure in 7 in group I and 2 in group II. The difference was significant (P< 0.05).
Conclusion: It was observed that 14 days antibiotic coverage provide slight better results as compared to 7 days antibiotic course.

Keywords: Antibiotic, neonatal, septicemia

Introduction

Neonatal septicemia is the chief cause of morbidity and mortality in the neonatal period, particularly so in developing countries [1]. Neonatal sepsis can be defined by the presence of at least two clinical symptoms and at least two laboratory signs in the presence of or as a result of suspected or proven infection (positive culture, microscopy or polymerase chain reaction) or clinical syndrome of bacteremia with systemic signs and symptoms of infection in the first four weeks of life [2].

Clinical signs comprised of modified body temperature: core temperature greater than 38.5°C or less than 36°C and/or temperature instability, cardiovascular instability such as bradycardia (mean HR less than the 10th percentile for age in the absence of external vagal stimulus, beta-blockers or congenital heart disease OR otherwise unexplained persistent depression over a 0.5 h time period) or tachycardia [3].

India has a huge burden of neonatal sepsis, with septicemia contributing to half the neonatal deaths in the community setting and to a quarter of all neonatal deaths in hospitals [4]. A shorter duration antibiotic course, if proved to be as effective as the conventional course, can reduce the duration of hospital stay and the cost of therapy for neonatal septicemia. The shorter duration course would be expected to have less adverse effects, less risk of secondary infections and drug resistance [5]. The present study was conducted to assess neonatal septicemia cases in pediatric department.

Materials & Methods

The present study was conducted in department of Pediatrics. It comprised of 84 babies with gestational age >32 weeks and/or birth weight >1500 g. The study protocol was approved from institutional ethical committee and written informed consent was obtained from all parents.

Data such as name, age, gender etc. was recorded. Babies were divided into 2 groups of 42 each. Group I received 7 days antibodies coverage and group II received 14 days. All were monitored for clinical signs and symptoms, blood cultures etc. Results were subjected to statistical analysis. P value less than 0.05 was considered significant.

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Results

Table I: Distribution of patients

Total- 84		
Groups	Group I (7- days)	Group II (14- days)
Number	42	42

Table I shows that group I received 7 days antibodies coverage and group II received 14 days. Each group had 42 babies.

Table 2: Comparison of variables

Variables	Group I	Group II
Gestational weeks	35.4	35.2
Birth weight (grams)	2018.4	1984.6
Early onset sepsis	16	20
Gram+ organisms	15	19
S. aureus	6	8

Table II shows that gestation in weeks in group I was 35.4 and in group II was 35.2, birth weight was 2018.4 grams in group I and in group II was 1984.6 grams, early onset sepsis was seen in 16 in group I and 20 in group II, gram + organisms were seen in 15 in group I and 19 in group II and S. aureus was evident in 6 in group I and 8 in group II.
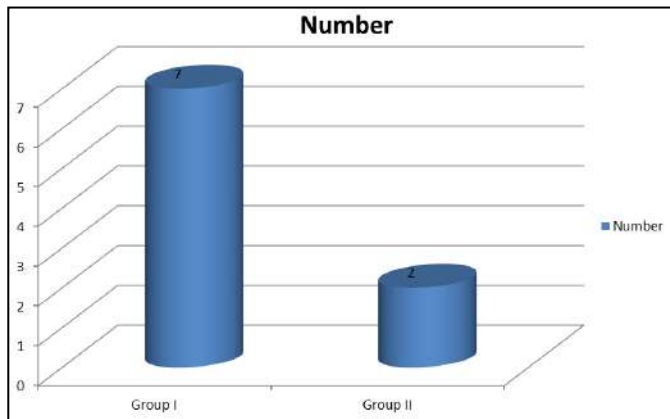
Graph I: Treatment failures

Graph I shows that there was treatment failure in 7 in group I and 2 in group II. The difference was significant (P< 0.05).

Discussion

There have been successful trials of shorter duration antibiotic therapy in systemic infections among children and infants beyond the neonatal period. Signs include cold to touch (hypothermia), poor perfusion (CRT), hypotension, renal failure, sclerema, bulging fontanels, neck retraction, poor weight gain [6]. Laboratory signs consists of white blood cells (WBC) count: <4,000 x10^9 cells/L OR >20,000 x10^9 cells/L, immature to total neutrophil ratio (I/T) greater than 0.2, platelet count <100,000 x10^9 cells/L, C reactive protein > 15 mg/L or procalcitonin ≥ 2 ng/ml, glucose intolerance confirmed at least 2 times: hyperglycaemia (blood glucose >180 mg/dL or 10 mMol/L) or hypoglycaemia (glycaemia < 45 mg/dL or 2.5 mMol/L) when receiving age specific normal range glucose amounts, metabolic acidosis: Base excess (BE) <-10 mEq/L or serum lactate > 2 mMol/L [7]. The present study was conducted to assess neonatal septicemia cases in pediatric department.

In this study, group I received 7 days antibodies coverage and group II received 14 days. Each group had 42 babies. Engle *et al.* [8] found that a total of 120 babies were eligible, 51 were excluded and 69 were randomized to receive either a 7-day course or a 14-day course of antibiotics. Baselines variables were comparable in the two groups. Primary outcome assessment could be done in 33

cases in either group. There was a trend to greater treatment failures in the 7-day group compared with 14-day group. On subgroup analysis of subjects with Staphylococcus aureus infection, those who received 7-day therapy had significantly more treatment failure than 14-day therapy whereas on sub-group analysis of babies with non-S. Aureus infections, treatment failure rates were identical (3.8% in both groups). On comparing the organisms isolated in the group of subjects which was not randomized by virtue of being symptomatic vs. the group which was randomized, it was found that S. aureus infections were significantly commoner in the former group (61.5 vs. 21.3%, respectively; P<0.001). Neonates 32 weeks and/or 1500 g with S. aureus sepsis require 14 days of antibiotics. S. aureus infection is also associated with failure to achieve clinical remission by the 5th day of antibiotic therapy.

We found that gestation in weeks in group I was 35.4 and in group II was 35.2, birth weight was 2018.4 grams in group I and in group II was 1984.6 grams, early onset sepsis was seen in 16 in group I and 20 in group II, gram + organisms were seen in 15 in group I and 19 in group II and S. aureus was evident in 6 in group I and 8 in group II. There was treatment failure in 7 in group I and 2 in group II. The most common causes are group B streptococcus (GBS) and Escherichia coli (E. Coli). The remaining cases of EONS are caused by Staphylococcus aureus (S. aureus), coagulase-negative staphylococci (CoNS), Listeria monocytogenes and other Gram-negative bacteria [9].

Conclusion

It was observed that 14 days antibiotic coverage provide slight better results as compared to 7 days antibiotic course.

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