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Aerobic Bacterial Isolates From Neonatal Septicaemia

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Abstract
224 clinically diagnosed neonatal septicaemia cases were studied between June 2013 and May 2014. Blood samples subjected to aerobic culture by standard techniques showed growth from 150 cases (66.69%). Predominant isolate was Staphylococcus aureus (41.33%), followed by Klebsiella pneumonia (34%) and Escherichia coli (12.66%). Enterococcus (5.33%), Pseudomonas aeruginosa (1.33%), Streptococcus pyogenes (2.33%), Micrococcus (0.66%), Proteus mirabilis (0.66%) and Listeria monocytogenes (0.66%). High degree of susceptibility to chloramphenicol, tetracycline, gentamycin and ciprofloxacin was seen. The study revealed that there is change in spectrum of infecting organisms in different places at different times. Hence antibiotic testing becomes mandatory in the treatment of neonatal septicaemia.
Keywords – *neonatal septicaemia , aerobic bacterial isolates.*

Introduction

Bacterial infections remain to be major cause of infant mortality and morbidity. During foetal life though the foetus is naturally protected from infections yet it suffers from many infections due to various factors. After birth, baby confronts with hostile microbial world and the organisms may get access through umbilicus, skin and mucosa. Infections are reported to be more common in preterm and low birth weight babies.[1]

Varieties of bacteria are known to cause neonatal septicaemia. Works by various authors indicate change in prevalence of bacteria causing neonatal septicaemia and antibiotic sensitivity pattern of the isolates .[2,3,4]. Therefore, it assumes importance to evaluate the bacterial spectrum and their sensitivity pattern from neonatal septicaemia cases, from time to time. Hence this work was undertaken to know the aerobic bacteria and their sensitivity, involved in neonatal septicaemia.

Materials and Methods

224 clinically diagnosed neonatal septicaemia cases from Sangameshwara teaching Hospital, attached to M.R.Medicalcollege, Gulbarga were studied from June 2013 to May 2014. Blood samples collected aseptically were subjected to aerobic bacterial culture and the isolates were identified and antibiotic testing was done as per standard microbiological techniques.[5]

Results and Discussion

Out of 224 cases studied, samples from 150 showed growth of pathogenic organisms (66.96%), as shown in table 1 and fig 1. Predominant isolate was Staphylococcus aureus (41.33%), followed by Klebsiella pneumonia (34%) and Escherichia coli (12.66%). Less predominate organisms isolated were Enterococcus (5.33%), Pseudomonas aeruginosa (1.33%), Streptococcus pyogenes (2.33%), Micrococcus (0.66%), Proteus mirabilis (0.66%) and Listeria monocytogenes (0.66%).

Table 1: Organism isolated from blood culture of neonatal septicaemia cases

Organism isolated	Number	Percent
Staphylococcus aureus	62	41.33%
Klebsiella pneumonia	51	34%
Escherichia coli	19	12.66%
Enterococcus	8	5.33%
Pseudomonas aeruginosa	5	3.33%
Streptococcus pyogenes	2	1.33%
Proteus mirabilis	1	0.6%
Listeria monocytogenes	1	0.66%
Micrococcus luteus	1	0.66%
Total	150	100%

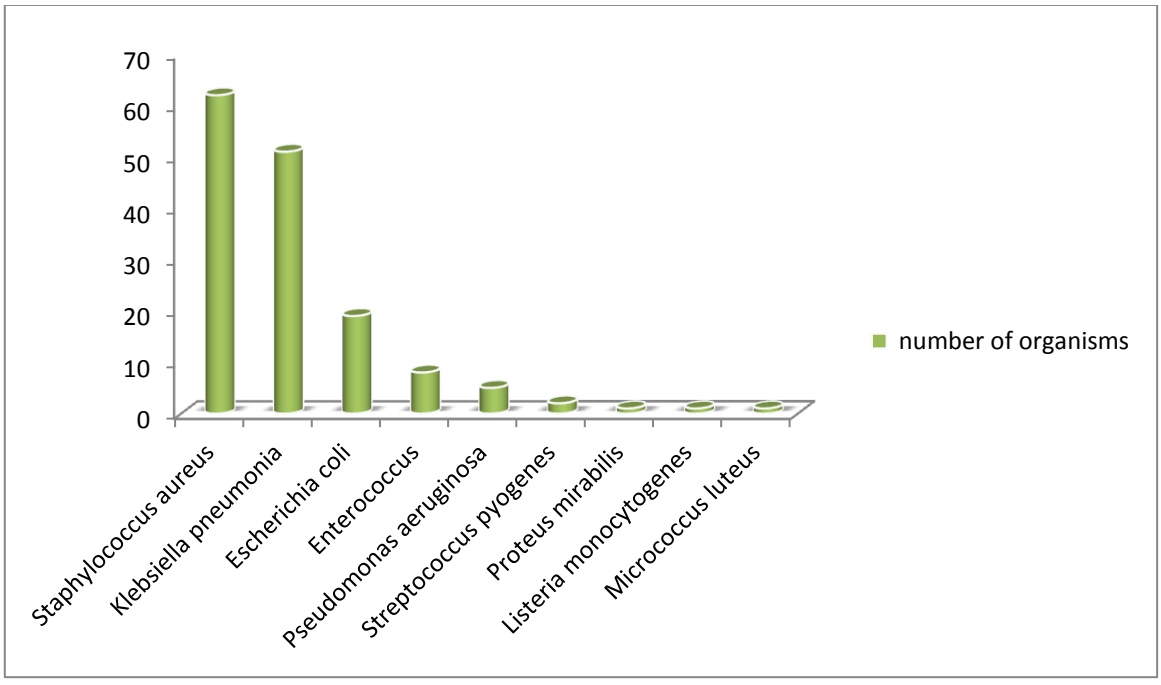

Fig -1 Graph showing Organism isolated from blood culture of neonatal septicaemia cases

Table 2: sensitivity of organisms isolated from neonatal septicaemia cases

	Staphylococcus aureus	Klebsiella	Escherichia coli	Enterococcus	Pseudomonas	Streptococcus	Proteus	Listeria	Micrococcus
Ampicillin	14	1	5	4	Nil	nil	nil	nil	Nil
Chloramphenicol	41	20	8	5	1	1	nil	1	Nil
Cephalexin	28	4	2	3	Nil	nil	nil	nil	Nil
Erythromycin	5	1	Nil	Nil	Nil	nil	nil	Nil	Nil
Gentamycin	15	13	6	2	2	nil	nil	Nil	Nil
Tetracycline	24	11	6	4	4	1	nil	1	Nil
Streptomycin	Nil	5	4	1	1	nil	nil	1	Nil
Co-trimoxazole	22	17	6	1	1	nil	nil	Nil	Nil
penicillin	8	1	nil	3	nil	nil	nil	1	nil

Sensitivity pattern of the organism isolated from these cases (table-II) showed sensitivity to Chloramphenicol, followed by Tetracycline , Gentamycin and Ciprofloxacin.

Incidence of neonatal septicaemia seems to vary over a period of time and different places. The spectrum of the causative organism also shows variation. It was reported that predominant organism causing neonatal septicaemia was Beta-haemolytic streptococcus[6]. With wide usage of penicillin and sulphonamides during 1940s streptococcus pyogenes was replaced by pathogenic staphylococcus aureus. Later gram negative organisms were reported to be the major causative organisms[2,3,4]. Even our study done during 1988 had revealed Esch.coli as the predominant pathogens followed by Klebsiellapneumonia and staphylococcus aureus is causing neonatal septicaemia[7].

Different author have reported the incidence of blood culture positivity around 50% - 59.5%. [1,2,4]. Our study reveals slightly higher incidence of 66.69%. In the present study staphylococcus aureus is the predominant pathogen in contrast to many reports where Eshcherichia coli &Klebsiella pneumonia were reported to be major pathogens involved in neonatal septicaemia. [5,8,9]. It is noticeable that all the isolates were highly sensitive to chloramphenicol, except Proteus mirabilis and Listeria monocytogenes species. Baring Pseudomonas aeruginosa among Listeria monocytogene & Proteus mirabilis all other isolates were sensitive to tetracycline. Tetracycline & ciprofloxacin were found to be effective against Staphylococcus aureus, Klebsiella pneumonia, Escherichia coli, Enterococcus, Streptococcus pyogenes& Micrococcus. Gentamycin showed bactericidal effect against Staphylococcus aureus, Klebsiella pneumonia, Escherichia coli & Pseudomonas. Striking features regarding antibiotic sensitivity of the isolates showed, high degree of susceptibility to chloramphenicol, tetracycline, gentamycin, the drug which clinicians do not favour in paediatric practice. Ciprofloxacin, therefore seems to be drug of choice for treatment of neonatal septicaemia.

Conclusion

Neonatal septicaemia is a disease seen worldwide. There seems to be change in spectrum of infecting organisms in different place at different times and so also the variation in antibiotic sensitivity pattern. Different studies over a period of three decades and the present study show that the prevalence of neonatal septicaemia has almost remained more or less same despite the advent of broad spectrum antimicrobial agents and technological advancements in life supportive therapy.

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