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Original Article (Short)

Microbiology Section

Acinetobacter spp.: An Emerging Pathogen in Neonatal Septicaemia

JEYAMURUGAN T, RAGULGANESH R, SUCILATHANGAM G, ASHIHABEGUM MA, VELVIZHI G, PALANIAPPAN N

ABSTRACT

Background and objectives: *Acinetobacter spp*. are gaining importance as a potential pathogen in neonatal septicaemia because of its frequent isolation and multidrug resistance. The aim of the present study is to investigate the incidence of Acinetobacter septicaemia in neonates and its antibiotic resistance pattern.

Materials and Methods: Neonates admitted to the neonatal intensive care unit with signs suggestive of sepsis were recruited into this prospective study.Blood culture and Antibiotic sensitivity test were carried out.

Results: Out of 50, 14 were blood culture positive, *Acinetobacter* accounted for 5 (35.7%) of the blood culture positive sepsis. Other organisms were *Citrobacter koseri(7.14%) Klebsiella oxytoca(7.14%)*, *Staphylococcus aureus(14.29%)*, *Klebsiella pneumoniae (21.42%)*, *Pseudomonas aeruginosa (7.14%)*, *Coagulase negative Staphylococci(7.14%)*.The organism was sensitive to Ampicillin (20%), Ciprofloxacin (40%), Amikacin (40 %),Gentamicin(60),Doxycycline(20%),Cefotaxime(60%),Meropenem(100%),Imipenem(100%),Piperacillin+Tazobactam (100%).

Conclusions: Low birth weight and preterm delivery are the potential risk factors of *Acinetobacter* sepsis. Sensitivity of *Acinetobacter* has changed over the years, previously they are sensitive to cephalosporins but now they have become resistant to it. High incidence of sepsis in institutional delivery indicates that the theatre protocol should be maintained.28% of cases were only culture positive, remaining clinical sepsis cases must be investigated for anaerobic infection. To prevent acinetobacter sepsis every hospital should follow infection control policy.

Key Words: Neonatal sepsis, *Acinetobacter spp*., Emerging Pathogen, Blood culture,Antibiotic sensitivity test

DISCUSSION

Septicaemia remains a significant cause of morbidity and mortality in the newborns, more so in the developing countries. In India, according to the National Neonatal Perinatal Database (NNPD) 2000, the incidence of neonatal septicaemia has been reported to be 24/1000 live births. Along with other organisms like *E.coli ,Klebsiella spp*., *Staphylococcus aureus*, *Pseudomonas spp*. and *Salmonella spp*., *Acinetobacter spp*. are gaining importance as a potential pathogen in neonatal septicaemia because of its frequent isolation and multidrug resistance [1]. The blood samples from 50 suspected neonatal septicaemia cases were cultured from April 2010 to September 2010 for the isolation of aerobic bacteria. The organisms were identified by conventional methods and antimicrobial testing was done according to Kirby Bauer's method [2].

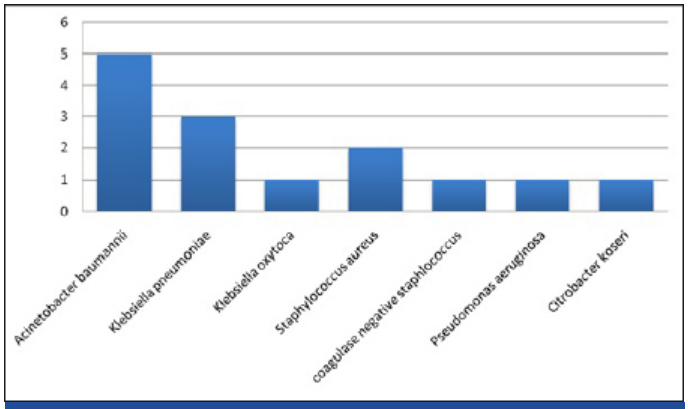
Among the 50 neonates who were investigated for septicaemia, the blood cultures of 14 neonates were positive, of which 5 babies (35.7%) showed septicaemia due to *Acinetobacter spp*. A pure growth of *Acinetobacter* was observed in all the 5 babies. All the *Acinetobacter isolates (100%)* were *Acinetobacter baumanni*. Two babies (40%) were term babies and 3 (60%) were preterm. Three of the neonates weighed less than 2500 gms while the remaining 2 weighed 2500 gms. The male to female ratio was 3:2. None of the 5 babies died. 4 were delivered at hospitals and one was delivered outside. All the 5 babies were delivered by caesarean section. All the babies had early onset sepsis [Table/Fig-1]. The babies who were born in hospitals showed a higher isolation of *Acinetobacter* spp. (4/5) [Table/Fig-2 & 3]. This might be because of the multidrug resistant strains which were existent in the hospital environment. All the 5 isolates were resistant to two or more antibiotics, the most notable resistance which was noted being the resistance to Ampicillin (80%), Cefotaxime (80%), Amikacin (60%) and Ciprofloxacin (60%). The strains were sensitive to Gentamicin (60%), Imipenem (100%), Meropenem (100%) and

Group	Sex		Onset		Maturity		Mode of delivery		Birth weight	
	Male	Female	EOS	LOS	Term	Preterm	Natural	LSCS	Low	Normal
Clinical Sepsis(50)	32	18	37	12	40	10	34	16	24	26
Culture proven Sepsis(14)	7	7	12	2	8	6	6	8	8	6
Acinetobacter Sepsis (5)	3	2	5	0	2	3	0	5	3	2

[Table/Fig-1]: Analysis of clinical and epidemiological characteristics in sepsis

Risk factors	No of neonates
LSCS	5(100%)
Low birth weight	3(60%)
Preterm birth	3(60%)
Age(<7)EOS	5(100%)

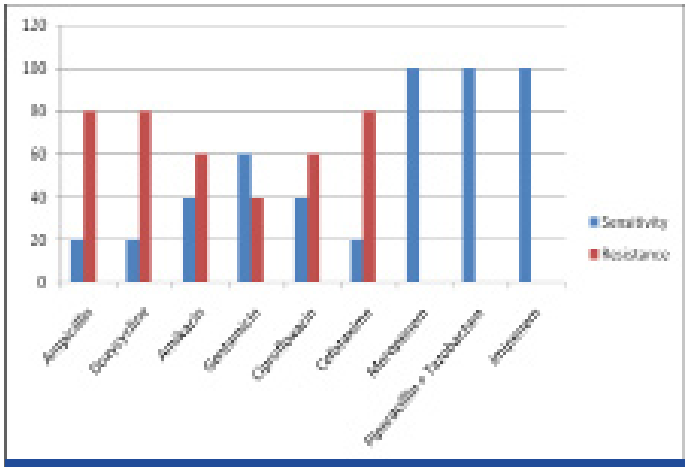
[Table/Fig-2]: Shows The Risk Factors For Infection In Babies Suffering From Acinetobacter Sepsis



[Table/Fig-3]:Bacteriological profile of Sepsis

Piperacillin+tazobactam (100%) [Table/Fig-4].

Septicaemia due to *Acinetobacter spp*. is common in babies with predisposing factors such as intravascular catheterization, endotracheal intubation, parenteral nutrition, broad spectrum antibiotic therapy and artificial ventilation. The incidence of *Acinetobacter* septicaemia in this study was 35.7% of all the total septicemia cases. It was comparable with the findings of the study which was conducted by Asit Mishra et al., (31.5%) [3]. In contrast, this percentage was higher than the studies which were conducted by Vinodkumar and Neelagund (8.3%), Arora et a.,l(12.3%) and Mondal et al., (15.2%) [1,4,5]. *Acinetobacter* baumannii was the only species which was encountered in my study (100% of the total cases of *Acinetobacter* septicaemia). This percentage was higher than the percentage in the study which was



[Table/Fig-4]: Antibiotic sensitivity pattern of *Acinetobacter spp*

conducted by Arora et al., (56.52%) [4].

Since all the babies had clinical features which were suggestive of septicaemia, the causative organism was considered to be significant. The present study highlighted *Acinetobacter spp*. as an important pathogen of nosocomial septicaemia in the NICU. Rational antibiotic use, along with the implementation of infection control policies, are required for the control of such infections.

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AUTHOR(S):
1. Dr. Jeyamurugan T
2. Dr. Ragulganesh R
3. Dr. Sucilathangam G
4. Dr. Ashihabegum MA
5. Dr. Velvizhi G
6. Dr. Palaniappan N

PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Microbiology, Tirunelveli Medical College Tirunelveli, 627 011, Tamil Nadu, India.
2. MBBS Student, Department of Microbiology, Tirunelveli Medical College, Tirunelveli, 627 011, Tamil Nadu, India.
3. Assistant Professor, Department of Microbiology, Tirunelveli Medical College Tirunelveli, 627 011, Tamil Nadu, India.
4. Assistant Professor, Department of Microbiology, Tirunelveli Medical College Tirunelveli, 627 011, Tamil Nadu, India.
5. Assistant Professor, Department of Microbiology, Tirunelveli Medical College Tirunelveli, 627 011, Tamil Nadu, India.
6. Professor Department of Microbiology Tirunelveli Medical College, Tirunelveli, 627 011, Tamil Nadu, India.

NAME, ADDRESS, TELEPHONE, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr.Jeyamurugan T., M.D. (Micro),
Assistant Professor Department of Microbiology,
Tirunelveli Medical College,
Tirunelveli District, 627 011, Tamil Nadu, India.
Phone: 9443325409
E-mail:
drjeyamurugan1968@rediffmail.com

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