Prevalence of Extended-spectrum β-lactamase Producing *Escherichia coli* and *Klebsiella spp* in a Neonatal Intensive Care Unit

This study reports the prevalence of extended-spectrum β-lactamase producing *Escherichia coli* and *Klebsiella spp* among septicemic neonates. Over a five year period, there were 94 isolates of *Klebsiella spp* and *E .coli*. Of these, 68 (72.3%) were ESBL producers. Forty (80%) of the *Klebsiella spp* isolates produced ESBL as compared to 28 (63.6%) of *E.coli.*

Key Words: ESBL, Neonates, Septicemia.

Prevalence of extended-spectrum β-lactamase (ESBL) producing bacteria ranges from 23-86% in earlier reports from India(1-5). This study was carried out from January 2003 to December 2007. Newborns with clinical signs of sepsis or those who were born to mothers with risk factors for infection were screened for sepsis with a blood culture. Standard methods were used for identification of microorganisms and antimicrobial susceptibility. Screening for ESBL production was done as per the Clinical Laboratory Standards Institute (CLSI) guidelines(6). Of the 8330 blood cultures during the 5-year study period, bacterial isolates were obtained in 262 (3.1%). Of these 152 (58%) were Gram negative organisms. These included *Klebsiella spp* (*n*=50, 32.9%), *E.coli* (*n*=44, 28.9%), non-fermenting Gram negative bacilli (*n*=23, 15.1%), *Pseudomonas spp* (*n*=14, 9.2%), *Enterobacter spp* (*n*=12, 7.9%), *Acinetobacter spp* (*n*=4, 2.6%), *Citrobacter spp* (*n*=3, 2%), *Achromobacter spp* (*n*=1, 0.66%) and *Serratia spp* (*n*=1, 0.66%). Of the 94 isolates of *Klebsiella spp* and *E. coli* tested for ESBL production, 68 (72.3%) were ESBL producers. Forty (80%) of the *Klebsiella spp* isolates produced ESBL as compared to 28 (63.6%) of *E.coli*.

There was no significant difference in the number of ESBL producing organism between inborn and outborn babies (79.2% *vs* 70%, *P*=0.44) or late onset sepsis and early onset sepsis (57.4% *vs* 42.6%, *P*=0.362). The incidence of ESBL producing organisms remained constant over the five years. The overall mortality was 27.6% and was comparable between the ESBL and the non ESBL group. The antibiotic resistance pattern is shown in ***Table* I**.

Most laboratories in India do not routinely check for ESBL production. As can be seen from our data, there is a high prevalence of ESBL producing organisms causing neonatal sepsis. What is alarming is that a major proportion of early onset sepsis, which is perinatally acquired and hence reflects community

TABLE I RESISTANCE PATTERN OF ANTIBIOTICS

Antibiotic	Overall	Non ESBL(*n = 26*)	ESBL(*n = 68*)	*P* value
Ampicillin	51/62 (82.2%)	5/16 (31.2%)	46/46 (100%)	<0.001
Cefotaxime	68/94 (72.3%)	0/26 (0%)	68/68 (100%)	<0.001
Ceftazidime	67/93 (72%)	0/26 (0%)	(67/67)100%	<0.001
Ciprofloxacin	60/92 (65.2%)	7/25 (28%)	53/67 (79.1%)	<0.001
Gentamicin	63/90 (70%)	2/25 (8%)	61/65 (93.8%	<0.001
Amikacin	32/65 (49.2%)	1/16 (6.2%)	31/49 (63.2%)	<0.001
Pipiracillin- Tazobactam	24/38 (63.1%)	0/8 (0%)	24/30 (80%)	<0.001
Ticarcillin -Clavulanic acid	24/45 (53.3%)	0/11 (0%)	24/34 (70.6%)	<0.001
Imipenem	0/85 (0%)	0/17 (0%)	0/68 (0%)	
Meropenem	0/85 (0%)	0/17 (0%)	0/68 (0%)	

ESBL: *is extended spectrum ß-lactamase producers*

acquired infection, is caused by drug resistant organisms. This is probably because of the widespread use of antibiotics in the community. Thus, it is imperative that this irrational use of antibiotics be discouraged not only in the neonatal unit but also in the community. Further, the routine screening for ESBL production should be encouraged.

Shalini Anandan, Niranjan Thomas*, Balaji Veeraraghavan and Atanu K Jana*
*From the Departments of Microbiology and *Neonatology, Christian Medical College, Vellore, India.*
niranjan@cmcvellore.ac.in

REFERENCES

1. Jain A, Roy I, Gupta MK, Kumar M, Agarwal SK. Prevalence of extended-spectrum beta-lactamase-producing gram-negative bacteria in septicaemic neonates in a tertiary care hospital. J Med Microbiol 2003; 52: 421-425.
2. Vinodkumar CS, Neelagund YF. Emergence of extended spectrum beta lactamase mediated resistance in neonatal septicemia. Indian J Pathol Microbiol 2006; 49: 616-619.
3. Sehgal R, Gaind R, Chellani H, Agarwal P. Extended-spectrum beta lactamase-producing gram-negative bacteria: clinical profile and outcome in a neonatal intensive care unit. Ann Trop Paediatr 2007; 27: 45-54.
4. Jain, A, Mondal R. Prevalence and antimicrobial resistance pattern of extended spectrum beta-lactamase producing *Klebsiella* spp isolated from cases of neonatal septicaemia. Indian J Med Res 2007; 125: 89-94.
5. Bhattacharjee A, Sen MR, Prakash P, Gaur A, Anupurba S. Increased prevalence of extended spectrum beta lactamase producers in neonatal septicaemic cases at a tertiary referral hospital. Indian J Med Microbiol 2008; 26: 356-360.
6. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Approved Standards M2-A7, Eighteenth Informational Supplement. Wayne, PA: CLSI document M100 –S 18; 2008.

Spectrum of Congenital Heart Diseases in Kashmir, India

A retrospective analysis of case-records data of 53,653 patients (0-18 years) over a two and half year period was conducted to ascertain the spectrum of congenital heart diseases. Two hundred and twenty one patients were found having congenital heart diseases; a prevalence of 4.1/1000. Ventricular septal defect (VSD) was the most frequent lesion seen in 69 (31.2%), followed by patent ductus arteriosus (PDA) in 36 (16.3%) children. Tetralogy of Fallot (TOF) was the most frequent cyanotic heart disease seen in 17 (7.8%) patients.

Key words: *Congenital heart disease, India, Prevalence.*

The prevalence of congenital heart disease (CHD) in India ranges between 3.9 – 26.4 per 1000 live births, in hospital based studies(1-3). We conducted this study to ascertain the prevalence and spectrum of CHD in children (aged 0-18 years) including those who were born in or attending our hospital over a two and half year period (Aug 2006–Jan 2009). Care was taken to avoid duplicate recording of the cases.

A total of 53,653 patients (aged 0-18 years) attended our hospital; suspected cases were subjected to detailed clinical examination, *X*-ray chest and ECG. Diagnosis was confirmed by echocardiography, as per standards of the American Society of Echocardiography(4). Echocardiography was performed by senior cardiologists twice in a week. Overall, 221 patients (113 males, 51.1%) were confirmed to have CHD. The CHDs in the order of frequency were; VSD in 69 (31.2%), PDA in 36 (16.3%), complex CHD's in 26 (11.8%), ASD in 25 (11.3%), tetralogy of Fallot (TOF) in 17 (7.8%), pulmonary stenosis (PS) in 15 (6.8%), and