Pattern of Pediatric Bacterial Infection and Antibiotic Resistance in New Delhi

The retrospective study analyzed 1025 bacterial isolates from blood cultures collected from pediatric patients admitted in a tertiary-care hospital in New Delhi to find out drug sensitivity patterns. Staphylococcus was isolated from approximate 70% of the cultures, with 63.7% of them being methicillin-resistant. Meropenem resistance among acinetobacter was 38.6%.

Keywords: *Antibiogram, Acinetobacter, Bacteremia, Treatment.*

Blood stream infection (BSI) is one of the major causes of morbidity and mortality in pediatric age group; rates upto 25% have been documented in previous studies from India [1]. However, lack of a surveillance system masks the pattern of antimicrobial resistance among childhood BSI across the country [2].

We conducted a review of hospital records to examine the bacterial organisms and their drug-sensitivity in blood cultures collected from children (up to 12 years) admitted in a tertiary-care public hospital in New Delhi during 2014. BSI was assessed according to CDC/NHSN criteria in children with acute infections, sepsis and pneumonia [3]. Samples were inoculated in brain-heart infusion broth (1:10 dilution) and incubated for 7 days at 37ºC. Subcultures were performed on blood agar and MacConkey agar after 48 hours and seven days. Coagulase negative *Staphylococcus* (CONS), when isolated, was confirmed by repeat culture. Antibiotic susceptibility of CONS was determined by Kirby Bauer disc diffusion method following CLSI guidelines [4].

A total of 1025 (14.9%) positive isolates were analyzed. Of them, *S. aureus* was most common (44.8%), with 63.7% being methicillin-resistant. Among gram positive isolates, penicillin resistance was high among both CONS and *S. aureus*. Among gram negatives, *E. coli* was most common (4.6%) followed by *Acinetobacter*. *Klebsiella* showed >60% resistance against amikacin and ciprofloxacin. Resistance to third generation cephalosporines was seen in *E. coli*, *Klebsiella* and *Enterobactor* (***Table* I**).

Similar to the present study, few recent studies have yielded high proportion of gram-positive bacteria among children in hospital set-up [5,6]. Indian Network for Surveillance of Antimicrobial Resistance earlier documented 41% prevalence of MRSA [7], which is much lower than our report and underscores the calls for strict vigilance over the amplifying threat of antibiotic resistance.

The prevalence of CONS was similar to a previous study [8]. The rise in resistance among *Acinetobactor* against higher antibiotics has long been a matter of concern [9]. Apart from *Acinetobactor*, we report emerging resistance to vancomycin among *Enterococci* as a newer threat.

With dominance of MRSA strain and emergence of 3rd generation cephalosporines resistance among gram negative bacteria, there is a dire need of close monitoring of antibiotic resistance. There is thus an urgent need to develop a strategy to stop increasing spectrum of resistance. ICMR has recently drafted standard operating procedure for antibiotic resistance surveillance for the country [10]; more than 400 centres including medical colleges are generating data. In the absence of prescription auditing, we need some indicators like defined daily dose per 100 bed-days to compare antibiotic consumption across the country. Documenting trends over the years would guide us in determining future usage of antibiotics. With no regulations at smaller set-ups, over-the-counter availability of higher antibiotics across the country suggests tough challenge for execution of the policy. Judicious and restricted use of antibiotic is the only feasible option left for us.

Contributors: MPR, RG, HKC: conceived the idea of the study; RG, IB: collected data; MPR, RG, KCA, HKC: conducted literature review; MPR: analyzed the data. Manuscript written and finalized by all the authors.
Funding: None; *Competing interest*: None stated.

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References

1. Tiwari DK, Golia S, Sangeetha KT, Vasudha CL. A study on the bacteriological profile and antibiogram of children below 10 years in a tertiary care hospital in Bangalore, India. J Clin Diagn Res. 2013:7:2732-5.
2. Mehta KC, Dargad RR, Borade DM, Swami OC. Burden of antibiotic resistance in common infectious diseases: Role

TABLE I ORGANISM FROM BLOOD CULTURE IN PEDIATRIC SEPSIS AND THEIR RESISTANCE PATTERN

Organism	*No (%)*	*Resistance pattern*
Staphylococcus aureus	459 (44.8)	283/444 (63.7%) methicillin
Coagulase-negative *Staphylococcus*	254 (24.8)	168/234 (71.8%) methicillin
Enterococcus species	73 (7.1)	19/70 (27.1%) vancomycin
Escherichia coli	47 (4.6)	14/42 (33.3%) 3rd generation cephalosporines
Acinetobacter species	45 (4.4)	17/44 (38.6%) meropenem
Klebsiella species	39 (3.8)	3/33 (9.1%) 3rd generation cephalosporines
Enterobacter species	36 (3.5)	5/29 (17.2%) 3rd generation cephalosporines

of antibiotic combination therapy. J Clin Diagn Res. 2014;8:ME05-8.
3. Horan TC, Andrus M, Dudeck MA. CDC/ NHSN surveillance definition for health care-associated infection and criteria for specific types of infections in the acute care setting. Am J Infect Control. 2008;36:309-32.
4. Clinical Laboratory and Standard Institute. Performance Standards for Antimicrobial Disc Susceptibility Tests. 2005, M100-S15. CLSI, Wayne PA.
5. Tsering D C, Chanchal L, Pal R, Kar S. Bacteriological profile of septicemia and the risk factors in neonates and infants in Sikkim. J Glob Infect Dis. 2011;3:42-5.
6. Prabhu K, Bhat S, Rao S. Bacteriologic profile and antibiogram of blood culture isolates in a pediatric care unit. J Lab Physicians. 2010;2:85-8.
7. Indian Network for Surveillance of Antimicrobial Resistance (INSAR) group, India. Methicillin resistant *Staphylococcus aureus* (MRSA) in India: Prevalence and susceptibility pattern. Indian J Med Res. 2013;137:363-9.
8. Karunakaran R, Raja NS, Ng KP, Navaratnam P. Etiology of blood culture isolates among patients in a multidisciplinary teaching hospital in Kuala Lumpur. J Microbiol Immunol Infect. 2007;40:432-7.
9. Turner PJ. Meropenem activity against European isolates: Report on the MYSTIC (Meropenem Yearly Susceptibility Test Information Collection) 2006 results. Diagn Microbiol Infect Dis. 2008;60:185-92.
10. Indian Council of Medical Research. Standard Operating Procedure for Antimicrobial Resistance Surveillance and Research Network. ICMR, New Delhi, 2015.

Prevalence of Congenital Hypothyroidism in Northern Border Region of Kingdom of Saudi Arabia

This retrospective study was done to assess the prevalence of congenital hypothyroidism among children born in Arar city, Kingdom of Saudi Arabia during years 2008 to 2014. Data were collected from newborns registry in Central hospital. The prevalence of congenital hypothyroidism was 2.6 per 10,000 live births with no gender difference.

Keywords: *Neonate, Newborn screening, Prevalence, Thyroid disorders*.

Congenital hypothyroidism (CH), occurring in approximately 1:2000 to 1:4000 newborns [1], is one of the most common preventable causes of intellectual disability [2]. Screening programs for CH have been developed in many countries [3]. There are three screening methods used including primary thyroid-stimulating hormone (TSH) with backup thyroxin (T4), primary T4 with backup TSH, and combined TSH plus T4 method. Primary TSH with backup T4 is more sensitive while primary T4 with backup TSH is more specific in detecting CH [4].

This retrospective study was done to assess the prevalence of congenital hypothyroidism among children born in Arar Central Hospital, Arar city, Kingdom of Saudi Arabia between 2008 and 2014. We analyzed records from 19,013 deliveries and 18,989 screened newborns. Blood samples were collected on filter paper from newborns on the fifth day after delivery, and tested for both TSH and T4. The cut-off value for TSH was 10 mU/L.

The prevalence of hypothyroidism among newborns for the whole observation period 2008 to 2014 was 3.1 per 10,000 in males and 2.1 per 10,000 in females, and the total prevalence was 2.6 per 10,000 (0.03%) (***Table* I**).

The incidence of congenital hypothyroidism in our area is similar to that reported in other countries [5], but lower than that reported in Najran, a southern province of