# Emergence of Resistance in Community-acquired Enteric Fever

We present a retrospective analysis of 225 blood culture-proven pediatric patients with the sensitivity pattern represented in the Antibiogram obtained by Vitek-2 Systems. Resistance to typhoid fever with commonly used oral antibiotics (Ciprofloxacin 41.4%, Amoxy-clavulonic acid 44.1% and Cotrimoxazole 32.7%) was common.

**Keywords**: *Antibiotic, Treatment, Salmonella typhi, Typhoid fever*.

Enteric fever is a systemic infection caused by *Salmonella enterica*, including *S. enterica* serotype Typhi (*S. typhi*) and serotype Paratyphi (*S. paratyphi*). Gold standard for diagnosing typhoid is bacterial isolation of the organism in blood cultures [1]. We present antibiotic sensitivity/ resistance pattern of salmonella isolates over a 30-month period.

Blood was drawn from 315 children (age 1-15 years) suspected to be having typhoid fever. It was inoculated immediately in PF bottles which showed positivity between 5-9 hours [2]. This blood was further streaked upon enriched media (XLDAgar) and (DCAgar). As the colonies appeared, species identification and Antibiogram was done by Vitek 2 systems [3].

Out of 315 children with suspected typhoid fever who underwent blood culture and sensitivity, 225 tested positive for Salmonella. ***Table* I** present the distribution and antibiotic sensitivity pattern of Salmonella isolates. As 129 isolates of *S. typhi* revealed sensitivity towards Ciprofloxacin, we retested these isolates with Nalidixic acid and found that 17 strains were resistant to it. The only isolate of *Salmonella paratyphoid A* was resistant to Ampicillin, quinolones, cefotaxime and gentamicin, and one out of five *Salmonella paratyphoid B* strain was extended-spectrum beta-lactamase producer, exhibiting multidrug resistance.

Widespread use of fluoroquinolones has resulted in emergence of *S. typhi* strains with reduced susceptibility and nalidixic acid-resistance. High frequency of nalidixic acid resistance, and multidrug resistance has also been documented earlier [4]. Prescribing antibiotics based on culture and sensitivity of the organism may restrain the further spread of drug resistance in pediatric population [4].

**TABLE I** SENSITIVITY PATTERN OF *S. TYPHI* AND *S. PARATYPHI B*

| | *S. typhi* (*N*=220) | *S. para typhi B* (*N*=5) |
|---|---|---|
| Ampicillin | 131 (59.5) | 3 (60) |
| Amoxy-Clavulonic acid | 123 (55.9) | 2 (40) |
| Piperacillin-Tazobactum | 220 (100.0) | 5 (100) |
| Cefuroxime | 135 (61.4) | 4 (80) |
| Cefotaxime | 64 (29.1) | 0 (0) |
| Cefixime | 102 (46.4) | 2 (40) |
| Ceftriaxone | 164 (74.5) | 3 (60) |
| Cefoperazone-Sulbactum | 220 (100.0) | 5 (100) |
| Ceftazidime | 205 (93.2) | 4 (80) |
| Cefepime-Tazobactum | 130 (59.1) | 3 (60) |
| Ofloxacin | 133 (60.5) | 4 (80) |
| Ciprofloxacin | 129 (58.6) | 4 (80) |
| Levofloxacin | 184 (83.6) | 4 (80) |
| Moxifloxacin | 144 (65.5) | 2 (40) |
| Gentamicin | 116 (52.7) | 2 (40) |
| Tobramycin | 198 (90.0) | 5 (100) |
| Amikacin | 164 (74.5) | 5 (100) |
| Nitrofurantoin | 137 (62.3) | 5 (100) |
| Cotrimoxazole | 148 (67.3) | 4 (80) |
| Meropenem | 204 (92.7) | 5 (100) |
| Azithromycin | 120 (54.5) | 3 (60) |
| Chloramphenicol | 205 (93.2) | 3 (60) |

*Values in No.(%) of strains sensitive.*

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