Nationwide Surveillance of Typhoid Fever in Both Hospital- and Community-Based Clinical Settings of Bangladesh Using ELISA-Based Rapid Diagnosis Method (TPTest)

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Background: Typhoid fever continue to be significant causes of illness and death, particularly in developing countries where unhygienic food, water and poor sanitation provide thriving conditions for typhoid-causing organisms. The versatile manifestations of typhoid fever make it a true diagnostic challenge. Although widely acceptable, the conventional blood culture can't depict the true burden of typhoid fever because of its major shortcomings like poor sensitivity, requirement of large volume of blood and preadministration of antibiotics. Antibiotics are used empirically which impedes blood culture. This study intends to delineate the epidemiology of typhoid fever in both hospital- and community-based clinical settings of Bangladesh, using ELISA-based rapid typhoid detection method (TPTest) which is free of all the drawbacks of culture method.

Methods: In this study, blood specimens were collected from 10 hospitals, spread all over the Bangladesh and three community-based clinical settings of Dhaka. Specimens were collected both in culture bottle to perform blood culture and heparinized tube to carry out TPTest. The antimicrobial susceptibility test of the isolated organisms was done by disc diffusion method.

Results: Over the one-year span of study period, a total number of 2036 specimens of suspected typhoid fever from 10 hospitals were tested, where 2.85% were culture positive and 26.03% were positive for TPTest. Among 266 specimens collected from three community settings, 16.5% and 34% were positive for blood culture and TPTest, respectively. Although the specimens from hospitalized patient were collected before any hospital administration of antibiotics, whether the patients took any dose before hospital admission was not recorded, which may have reflected in blood culture result of two different settings. Among the total isolated (103) *Salmonella* Typhi and Paratyphi, 18 (17.5%) were *Salmonella* Paratyphi. The antimicrobial susceptibility test result reveals that all the isolated organisms were resistant to Nalidixic acid where 21%, 13% and 9% were resistant to Cotrimoxazole, Ciprofloxacin and Azithromycin, respectively.

Conclusions: The TPTest is a more sensitive method and highly suitable for countries where antibiotics are used unrestrainedly, to diagnose and determine the true burden of typhoid fever as the conventional one fails adequately.