

Title: Microbial Interactions 2019 & Advanced Microbiology 2019: Antibiotic susceptibility pattern of Salmonella isolated from enteric fever suspected patients - Bijayata Shrestha - HAMS Hospital, Nepal

Bijayata Shrestha

HAMS Hospital, Nepal

Abstract:

Background: Enteric fever is one of the most common diseases encountered worldwide and is endemic in Nepal. This study was conducted to access antibiotic susceptibility pattern of Salmonella isolates from culture positive cases of enteric fever. Enteric fever, a foundational disease brought about by Salmonella typhi (*S. typhi*) and Salmonella paratyphi (*S. paratyphi*), is a significant determined worldwide medical issue and is transcendently announced in the creating nations. The most widely recognized hazard factors are sullied drinking water or food with dung from either intensely contaminated people, relentless excretors, or interminable asymptomatic transporters, poor sanitation, lacking cleanliness practices, and low financial status. About 22 million new instances of enteric fever with 200,000 mortality cases for each year have been accounted for around the world.

Enteric fever is the significant general medical issue in the Indian subcontinent also. *S. typhi* and *S. paratyphi* An are the prevalent life forms engaged with enteric fever in India. Instant and successful antimicrobial treatment is the pillar in the administration of enteric fever to block the instances of bleakness and mortality. The ailment may keep going for 3 a month without treatment, and the case-casualty rates might be as high as 30%, yet with fitting treatment, clinical side effects are died down inside a couple of days, fever retreats inside 5 days, and death rates are decreased to <1%.⁷ But the unpredictable use and transcendently abuse of the antimicrobials have brought about the development of multidrug-safe strains.

Chloramphenicol was alluded to as the best quality level of treatment since its presentation in 1948. However, irregular protection from chloramphenicol was accounted for in Britain in 1950, likely because of its abuse. In May 1972, an episode of

chloramphenicol-safe *S. typhi* was accounted for in Kerala (India) where 54% of the separates were seen as impervious to chloramphenicol in vitro. In 1989, there was a quick rise and spread of multidrug-safe *S. typhi* (impervious to ampicillin, chloramphenicol, and trimethoprim sulfamethoxazole) in a few pieces of India. In 1990, multidrug-safe *S. typhi* disconnects were accounted for from Mumbai and New Delhi. Before the finish of the 1990s, Salmonella enterica created obstruction at the same time to all first-line drugs like chloramphenicol, cotrimoxazole, and ampicillin. Chloramphenicol-safe quality carried on plasmids is chloramphenicol acetyltransferase type 1, which codes for a compound that inactivates chloramphenicol by means of acetylation of 2 hydroxyl gatherings of chloramphenicol. With the development of chloramphenicol-safe Salmonella disengages, fluoroquinolones (eg: ciprofloxacin and ofloxacin) rose as the medication of decision for the treatment of typhoid, attributable to the oral method of organization and cost-effectiveness. But uncontrolled utilization of quinolones brought about expanded opposition against them, particularly ciprofloxacin, which thusly might be because of consecutive transformations in qualities (*gyr A*, *gyr B*, and standard C, standard E) encoding DNA gyrase and topoisomerase IV or improved dynamic efflux instruments. Expanded protection from fluoroquinolone prompted expanded utilization of third-age cephalosporins (eg: ceftriaxone, cefotaxime, cefixime) and azithromycin in South Asia. However, cessation/decrease of chloramphenicol use and the utilization of different medications for the treatment of enteric fever brought about move back to affectability against chloramphenicol. This reappearance of chloramphenicol-affectability might be potentially because of loss of plasmids encoding protection from chloramphenicol and other first-line drugs like ampicillin, co-trimoxazole or because of the development of powerless disengages without sedate weight.

In this setting of changing elements of protection from anti-infection agents, it is basic to have steady reconnaissance and anti-infection powerlessness information accessible to clinicians for suitable administration of the malady. The ordinary technique for anti-microbial powerlessness testing by plate dissemination strategy is by a wide margin the commonest strategy for decision for the normal lab for choice of proper antimicrobial medication. Be that as it may, assurance of least inhibitory focus (MIC) of a reasonable anti-microbial either by stock weakening or E-test can be of an incredible assistance to assess the correct helpful portion in tranquilize safe circumstances. E-strip is a quantitative technique for antimicrobial vulnerability testing and applies both the weakening of anti-microbial and dissemination of anti-microbial into the way of life medium where a predefined stable antimicrobial angle is available in a flimsy inactive bearer strip. E-test technique is considered as a quick, dependable, exact, advantageous, and a reproducible strategy with high particularity (33–96%), consistency (56–100%), and affectability (75–100%). The danger to human wellbeing presented by anti-infection safe bacterial pathogens is of developing worry to clinical practice. This examination explored the anti-microbial affectability example of *Salmonella typhi* disconnected from blood example. One hundred blood tests were gathered from suspected typhoid fever patients in 31 Artillery Brigade Medical Center, Minna, and were dissected for *S. typhi* while anti-toxin affectability testing was done Kirby-Bauer technique. Sixty (60.0%) examples out of the all out 100 were sure for bacterial development. The living beings confined 2 incorporate *Salmonella typhi*; 45 (75.0%), *Shigella*; 6 (10.0%), *E. coli*; 3 (5.0%), *Klebsiella*; 3 (5.0%), *Enterobacter*; 2 (3.3%), and *Citrobacter*; 1 (1.7%). Consequence of the affectability test indicated that the secludes were impervious to all the anti-infection agents; ceftriaxone, cefuroxime, amoxicillin, ampicillin, ciprofloxacin, and augmentin, which are the medication of decision routinely utilized

in the examination zone for the treatment of typhoid fever. They were anyway delicate to chloramphenicol and ofloxacin, which, lamentably, are not utilized in this examination zone for the treatment of typhoid fever. There have all the earmarks of being numerous medication safe (MDR) strain of *S. typhi* in the examination zone. These might be because of overdependence or uncontrolled utilization of the couple of accessible anti-microbials and additionally off base or uncertain determination bringing about the turn of events and spread of safe strains of *S. typhi*. The investigation, hence, features the requirement for a solid coordinated effort between the doctors and the lab in the selection of anti-microbials for the treatment of bacterial illnesses so as to demoralize the advancement of safe strain of bacterial pathogen.

Methods: Altogether 505 blood samples were collected from patients clinically suspected of enteric fever attending HAMS Hospital. All blood samples were cultured by BACTEC method and sub cultured in blood agar and MacConkey agar plates. All isolates were identified by colony characteristics, biochemical tests and serotyping methods. Antibiotic susceptibility test was performed by modified Kirby Bauer disc diffusion method interpreted with CLSI guideline.

Result: Isolation rate of *Salmonella* species was 3.6%. Among 18 *Salmonella* isolates, 10 were *S. typhi*, 8 were *S. paratyphi A*. The prevalence rate of infection was high among the age group 11-20 years (50%) and among the male patients. However, there was no significant association of enteric fever with gender of patients ($p=2.47$). All 18 isolates were sensitive to Amoxicillin, Azithromycin, Ceftriaxone and Chloramphenicol, Ciprofloxacin and Ofloxacin. Majority of isolates were sensitive to Cefixime (94.4%), Cotrimoxazole (94.4%) and Cefotaxime (90%). There were no any MDR isolates. Higher percentage of isolates was resistant to Nalidixic acid (87.5%).

Conclusion: The decreased susceptibility to Fluoroquinolones of *S. typhi* and *S. paratyphi A* can be correlated with resistance to Nalidixic acid. Commonly used third generation Cephalosporins and rolled back first line drugs are the choice in case of NARS isolates.