Non-typhoidal Salmonella urinary tract infection: Molecular resistance and clinical correlation – A four year study from a tertiary care centre

R.D. Sahni 1, B. Subashini 1,2, B. Veeraraghavan 1, D. Prabha 1, Y.D. Devi 1, A. Devasia 2, T.D. Sudarsanam 2

1 Christian Medical college, Vellore, Tamil Nadu, India
2 Christian Medical College and Hospital Vellore, Vellore, India

Background: Extra intestinal manifestations due to Non-typhoidal Salmonella (NTS), especially bacteriuria are rare. The aim of the study was to determine the incidence, clinical spectrum of disease, phenotypic and genotypic resistance patterns among the isolates and clinical outcomes.

Methods & Materials: Salmonella spp was isolated from urine specimens at our centre were studied retrospectively between January 2011 and December 2014. All the isolates were identified biochemically, serotyped according to Kauffman and White antigenic scheme and confirmed at the National Salmonella & Escherichia center, Central Research Institute, Kasauli, India.

Antibiotic susceptibility testing was performed according to CLSI guidelines. Further, molecular characterization was performed to detect resistant genes dhfr1, Sul 2, bla- OXA,bla-TEM,Amp,CTX-M-1,qnr (A,B,S),class 1 and class 2 for sulphonamide, beta-lactam,quinolone and integron resistance respectively.

Clinical outcomes were determined through a review of medical records.

Results: Over four years 1,86,298 urine specimens were received. Salmonella spp was isolated in 36 specimens among which NTS was identified in 23 specimens. Concomitant blood cultures were positive in 27% of cases. Salmonella group C1(n = 9) followed by Salmonella group C2(n = 5) were the most common species isolated. The other groups identified were Salmonella Typhimurium (n = 4), Salmonella Typhosa group E(n = 3) and Salmonella group D (n = 1).

Phenotypic resistance was seen in 50% isolates to nalidixic acid and 30% to ciprofloxacin and 5% to ceftiraxone. 47% of isolates carried resistant genes and the presence of class 1 integrons while 5% class 2 integrons.

Clinically, the predisposing factors included urologic abnormalities (26%) and immunosuppression due to infections, immunosuppressive drugs, diabetes, pregnancy and age related immunosuppression (30%). Most patients were women (65%). At presentation, 43% of patients presented with fever and dysuria. Only one presented with gastroenteritis. None were treated with the drugs toward which resistant genes were detected.

Conclusion: Immunosuppression, urologic abnormalities and the female gender remained as the most common predisposing factor. Salmonella group C1 the most common group and high prevalence of genotypic integron mediated resistance is seen among NTS isolates causing urinary tract infections.

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