

Prevalence of GyrA Mutations, QnrA and QnrB Among Different Clinical Isolates of Quinolones Resistance Salmonella Spp

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Background & Objectives: Quinolones belong to a group of commonly used antibiotics for treatment of variety of clinical infections caused by salmonella in adult. Resistance to quinolones is typically attributed to mutations of DNA gyrase and topoisomerase IV genes, change in regulation of efflux pumps, decreased permeability of Omps, hydrophobicity of drugs and plasmid encoded qnr genes. The aim of this study was to find association between different mutations in gyrA, presence of plasmid encoded qnrA and qnrB genes and resistant phenotypes to quinolones in clinical isolates of Salmonella spp.

Methods: During April 2008 to December 2009, 177 Salmonella isolates were collected from diarrheal patients in Tehran. All isolates were tested for susceptibility to quinolones antibiotic by disk diffusion methods according to the CLSI Methods. Whole DNA was extracted from the isolates by boiling Methods. PCR of the QRDR segment of the gyrA, qnrA and qnrB genes was done by specific primers. The sequences were analyzed by Lasergene software.

Results: Results of the susceptibility tests demonstrated that 102(57.6%) of the isolates were nalidixic acid resistance. The resistant rate to Enrofloxacin (51%), Ofloxacin(9.8%) and Norfloxacin and levofloxacin (1%) were observed respectively. The predominant substitution in QRDR of gyrA gene was in codon position 87 (69.6%) and 83 (10.7%). New amino acid replacements (Ala118-Thr), (Glu133-Gly), and (Ser147-Phe) were observed in six isolates. 16(15.7%) of resistant isolates did not have any mutation in gyrA gene. No qnrA and qnrB genes were detected.

Conclusion: High frequency of quinolones resistant salmonella spp in our clinical isolates showed that this resistance is increasing dramatically in IRAN. Comparison of identified mutation in QRDR of gyrA among the fluoroquinolones (Enrofloxacin) in compare to Nalidixic acid resistant isolates didn't show significant differences that proposed involvement of mutation. Other resistant mechanisms in these isolates need further studies.

Keywords: Salmonella; Quinolones Resistance; GyrA Mutation; QnrA and QnrB