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Investigation of fluoroquinolone resistance in *Escherichia coli* isolated from swine feces in Korea

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Statement of the Problem: Fluoroquinolone (FQ) resistance is rapidly increasing worldwide and considered as a serious threat to the public health. FQ has been prohibited as a feed additive since 2009 in an effort to reduce antimicrobial resistance in food-producing animals in Korea. Consequently, FQ-resistant bacteria are expected to decrease in the animal industry in Korea.

Methodology & Theoretical Orientation: The study was performed to investigate the prevalence of FQ resistance and plasmid-mediated quinolone resistance (PMQR) genes in *E. coli* isolated from swine; and the antimicrobial resistance profile and FQ resistance mechanisms of FQ-resistant *E. coli. E. coli* were isolated from a total of 237 swine feces. Antimicrobial susceptibility tests were performed against 16 different antimicrobial agents including FQ, and the three major FQ resistance mechanisms were investigated by sequencing of quinolone resistance determining regions (QRDR), detection of PMQR, and measuring of efflux pump activity.

Findings: Of 171 *E. coli* isolates, 59 (34.5%) isolates were determined as FQ-resistant. Of 59 FQ-resistant isolates, PMQR genes were detected in nine isolates (15.3%). Efflux pump activity was found in 56 isolates (94.9%), but this was not correlated with the increased FQ resistance. Point mutation in QRDR was detected in all 59 isolates (100%) and the main cause of FQ resistance. Of 59 FQ-resistant *E. coli*, 54 isolates (91.5%) were classified as multi-drug resistant *E. coli*.

Conclusion & Significance: Although the use of FQ as a feed additive has been prohibited in Korea, the prevalence of FQ resistance and PMQR genes has increased considerably in swine. The increased FQ resistance observed in this study may be, in part, due to the increased use of FQ for self-treatment and therapeutic purposes. Therefore, prudent use of FQ in animal farms is warranted to reduce the evolution of FQ-resistant bacteria in the animal industry.

Biography

Kun Taek Park completed his DVM and MS at College of Veterinary Medicine, Seoul National University, and PhD at College of Veterinary Medicine, Washington State University. After completion of his PhD, he served as Co-director of Flow-Cytometry and Monoclonal Antibody Center at Washington State University for five years. He has worked at Seoul National University as a Research Professor. His research interest includes Epidemiology of Foodborne Pathogens and Antimicrobial Resistance in Industrial Animals.

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