

Risk Factors and Regional Difference in the Prevalence of Fecal Carriage Third-Generation Cephalosporin-Resistant E. Coli in Taiwan

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Abstract : Background: Investigating the risk factors for the fecal carriage of third-generation cephalosporin-resistant E.coli could contribute to further disease prevention. Previous research on third-generation cephalosporin-resistant prevalence in children in different regions of Taiwan is limited. This project aims to explore the risk factors and regional differences in the prevalence of third-generation cephalosporin-resistant and other antibiotic-resistant E. coli in the northern, southern, and eastern regions of Taiwan. Methods: We collected data from children aged 0 to 18 from community or outpatient clinics from July 2022 to May 2023 in southern, northern, and eastern Taiwan. The questionnaire was designed to survey the characteristics of participants and possible risk factors, such as clinical information, household environment, drinking water, and food habits. After collecting fecal samples and isolating stool culture with E.coli, antibiotic sensitivity tests and MLST typing were performed. Questionnaires were used to analyze the risk factors of third-generation cephalosporin-resistant E. coli in the three different regions of Taiwan. Results: In the total 246 stool samples, third-generation cephalosporin-resistant E.coli accounted for 37.4% (97/246) of all isolates. Among the three different regions of Taiwan, the highest prevalence of fecal carriage with third-generation cephalosporin-resistant E.coli was observed in southern Taiwan (42.7%), followed by northern Taiwan (35.5%) and eastern Taiwan (28.4%). Multi-drug resistant E. coli had prevalence rates of 51.9%, 66.3%, and 37.1% in the northern, southern, and eastern regions, respectively. MLST typing revealed that ST131 was the most prevalent type (11.8%). The prevalence of ST131 in northern, southern, and eastern Taiwan was 10.1%, 12.3%, and 13.2%, respectively. Risk factors analysis identified lower paternal education, overweight status, and non-vegetarian diet as statistical significance risk factors for third-generation cephalosporin-resistant E.coli. Conclusion: The fecal carriage rates of antibiotic-resistant E. coli among Taiwanese children were on the rise. This study found regional disparities in the prevalence of third-generation cephalosporin-resistant and multi-drug-resistant E. coli, with southern Taiwan having the highest prevalence. Lower paternal education, overweight, and non-vegetarian diet were the potential risk factors of third-generation cephalosporin-resistant E. coli in this study.

Keywords : Escherichia coli, fecal carriage, antimicrobial resistance, risk factors, prevalence

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