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Risk Factors for Fecal Carriage of Extended-Spectrum Beta-Lactamase Producing Escherichia coli and Klebsiella spp. in the Community

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Abstract: Aim: Community-acquired infections caused by extended-spectrum beta-lactamase (ESBL)-producing bacteria are an emerging problem. Digestive tract colonization is a prerequisite for infections by ESBL-producing microorganisms. The aim of this study was to determine the prevalence of and risk factors for fecal carriage of ESBL-producing Escherichia coli (E. coli) or Klebsiella spp. in the community. Materials and Methods: A total of 928 stool samples admitted to the laboratory during a four-month period were included in the study. Samples were diluted in saline and cultured in two EMB agar plates supplemented with either 1 µg/ml cefotaxime or 1 µg/ml ceftazidime. All isolates that grew were identified to the species level. E. coli and Klebsiella spp. strains were tested for ESBL production with ceftazidime and ceftazidime-clavulanate discs according to the Clinical and Laboratory Standards Institute (CLSI) Guideline. Results: Of the 928 stool samples included, 133 (14%) were isolated from inpatients and 795 (86%) from outpatients. Sixty-three (47.3%) of 133 hospitalized and 121 (15.2%) of 795 outpatients harbored ESBL-producing E. coli and Klebsiella spp. (P = 0.000). Chronic hepatic failure (OR: 8.7, CI: 1.65-46.12; P = 0.011) and recent antibiotic use (OR: 4.4, CI: 1.76-11.16; P = 0.002) were found to be associated with ESBL positivity for the hospitalized patients. Recent antibiotic use (OR: 2.8, CI: 1.61-5.12; P = 0.000) was found to be the only independent variable associated with ESBL positivity for the outpatients. Conclusions: The high prevalence (15.2%) of fecal carriage of ESBL-producing bacteria in the community warrants further study in this field including the consequences of this colonization in the hospital setting.

Key Words: ESBL positivity, fecal carriage, risk factors, E. coli, Klebsiella spp.

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