Title: DISTRIBUTION OF INTEGRONS AND GENE CASSETES AMONG DIARRHEAGENIC AND NON-DIARRHEAGENIC *Escherichia coli*

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Abstract:

Escherichia coli is considered as one of the most important and well studied bacterial groups. The species is ubiquitous and highly diverse both phenotypically and genotypically. Although the majority of *E. coli* strains are considered as harmless, the organism is greatly important in nosocomial and community acquired infections. Among *E. coli*-associated diseases acute diarrhea should be highlighted. Antimicrobial resistance has become a major public health problem. The property is commonly coded by genes carried by mobile genetic elements such as gene cassettes that may be captured by integrons defined as genetic units that act both as cloning systems and expression vectors. We addressed the characterization of integrons and gene cassettes in diarrheagenic (DEC) and non-diarrheagenic (NDEC) *E. coli* isolates. The study group comprised 187 strains: 107 DEC (67 enterotoxigenic/ETEC and 40 enteropathogenic/EPEC) and 80 NDEC. Previously proposed PCR protocols targeting class 1 and 2 integrons were employed and subsequently we searched for gene cassetes among integron-positive isolates. PCR bands corresponding to gene cassettes were submitted to sequencing reaction in order to seek for antimicrobial resistance determinants. Integron-positive strains showed to be similarly distributed among ETEC, EPEC, and NDEC (≈ 20-25%). Class 1 integrons were more frequently found. Gene cassettes were observed in the majority (63.9%) of integron 1-positive strains and in all integron 2-positive isolates. Genes that code for resistance to β-lactams, streptomycin, spectinomycin, trimethoprim, and streptothricin were detected. On the basis of the similar distribution of integrons and gene cassettes among DEC and NDEC it is possible to suggest that they were not implicated in bacterial virulence. Our data also confirm the widespread distribution of antimicrobial resistance genes among *E. coli* regardless of they are pathogens or harmless strains. Taken together our results also stress the need to monitor bacterial resistance and to adopt procedures aiming to control the dissemination of such characteristic.

Keywords: *Escherichia coli*, acute diarrhea, antimicrobial resistance, integron, gene cassette.

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