

**TITLE:** COMPARATIVE ANALYSIS OF THE VIRULENCE OF *ESCHERICHIA COLI* ISOLATED FROM BLOOD STREAM INFECTION FROM IMMUNOCOMPROMISED PATIENTS

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**ABSTRACT:**

Extraintestinal pathogenic *Escherichia coli* (ExPEC) is one of the main etiological agents of blood stream infections around the world, affecting patients of all ages. It is recognized that the extremes of life (children and elder) hold physiological immune deficiencies that predispose them to various infections in a manner different from what happens to adults that have a fully developed immune system. Nevertheless, this immunodeficiency due to immaturity in the youngster is not the same as that of elderly which comes from senescence. Thus the pathogens affecting these two groups of individuals may use different virulence strategies to succeed in causing disease. To address this issue we studied the virulence profile of *E. coli* isolated from the blood stream of 87 pediatric patients (PP) ( $\leq 18$  years old), and 114 of geriatric patients (GP) ( $\geq 60$  years old). Twenty-nine virulence factors (VF) were searched by colony hybridization using specific DNA probes. The phylogenetic origin of strains was determined by the quadruplex PCR method of Clermont, and the intrinsic virulence (ExPEC<sup>+</sup> or ExPEC<sup>-</sup>) of the strains was defined by the presence of at least two genes among *pap*, *sfa*, *afa/dra*, *kpsMTII* and *iuc* genes. The phylogroup B2 prevailed among strains of both age groups (29 % in PP and 39% in GP), followed by phylogroups A (16%), and B1 (17%) in PP, and B1 and E (14% each) in GP. The frequency of toxins differed between groups. In PP the *vat* toxin gene was the most frequent, followed by *sat*, *hlyF*, *hlyA* and *cnf*, while in GP the *sat* gene was the most frequent, followed by *hlyA*, *vat*, *cnf1*, and *hlyF*. Comparing both age groups, the higher frequencies observed for *hlyF* in PP, and for *pap*, and *iha* in GP, were statistically significant ( $P < 0,05$ ). Additionally, the presence of ExPEC<sup>+</sup> strains was higher in GP (57% versus 43%) ( $P < 0,05$ ). Of note, the two age groups showed significant differences regarding the frequency of intrinsically virulent strains (ExPEC<sup>+</sup>), and the frequency of *hlyF*, *pap*, and *iha* as well. More studies are needed to understand the meaning of the differences pointed in this study. We believe that particular attention should be given to the role of toxins in the pathogenicity of these strains. The understanding that diverse conditions of immune impairment may drive the susceptibility to pathogens of different virulence profiles would help the design of preventive measures against such human and financial costly diseases.

**Keywords:** Extraintestinal Pathogenic *Escherichia coli*, virulence, phylogenetic origin, blood stream infection.