TITLE: CHARACTERIZATION OF ENTEROAGGREGATIVE *ESCHERICHIA COLI* IN CHILDREN WITH DIARRHEA IN PORTO VELHO, RONDÔNIA, WESTERN BRAZILIAN AMAZON

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ABSTRACT:

According to the World Health Organization (WHO), diarrhea is the second leading cause of morbidity and mortality in children under 5 years of age. Several viral, bacterial and parasitic agents are associated with diarrhea. Among bacterial pathogens, the Enteroaggregative *Escherichia coli* (EAEC), is strongly associated with those cases of child diarrhea and is known for acquiring specific virulence factors that contribute to its pathogenicity. Several potential virulence factors have been described for EAEC. EAEC pathogenesis involves the processes of cell aggregation, biofilm production, mucosal toxicity, and inflammation. The present study aimed to investigate in stool samples EAEC strains and to identify genes that potentially contribute to virulence, biofilm production, and antimicrobial resistance from children in Porto Velho, Rondônia. All *E. coli* isolates were subjected to HEp-2 adherence, EAEC 042 was used as a positive control (for aggregative adherence). EAEC virulence factors were identified by PCR using specific primers. A total, 1. 625 *E. coli* were isolates from 591 children up to 6 years of age who were hospitalized with acute gastroenteritis at the Cosme and Damião Children's Hospital, a public tertiary care institution in Porto Velho, between February 2010 and February 2012. In this study, 85 EAEC strains were isolated from 51 children with acute diarrhea. The *aggR* gene was detected in 63.5% (54/85) of EAEC, and a statistically significant correlation was observed between typical EAEC (presence of *aggR*) and *aatA* ($P < 0.0001$), *irp2* ($P = 0.0357$), and *shf* ($P = 0.0328$) genes. It was verified that among of the 85 EAEC strains analyzed, 69% (59/85) were biofilm producers. Between these, 63.2% (43/59) carried the *aggR* gene versus 42.3% (11/26) of the non-producers ($P = 0.0135$). We also identified an association between the *aatA* gene and biofilm production; 61% (36/59) of producer strains versus 19.2% (5/26) of non-producer strains ($P < 0.0004$) harbored the gene. Antibiotic sensitivity test revealed that the majority of the EAEC were resistant to ampicillin (70.6% (60/85), sulfamethoxazole 60%; (51/85), tetracycline 44.7% (38/85), and cefotaxime 22.4% (19/85). To our knowledge, this is the first study in northern Brazil to investigate EAEC virulence factors and to demonstrate antimicrobial susceptibility of EAEC strains isolated from cases of childhood diarrhea.

Keywords: Enteroaggregative *E. coli*, Diarrhea, Children

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