Research Article

Case-Control Pilot Study on Acute Diarrheal Disease in a Geographically Defined Pediatric Population in a Middle Income Country

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Introduction. Acute diarrheal disease (ADD) is a common cause of morbidity and mortality in children under 5 years of age. Understanding of the etiology of ADD is lacking in most low and middle income countries because reference laboratories detect limited number of pathogens. The objective of this study was to determine the feasibility to conduct a comprehensive case-control study to survey diarrheal pathogens among children with and without moderate-to-severe ADD. Materials and Methods. Microbiology and molecular-based techniques were used to detect viral, bacterial, and parasitic enteropathogens. The study was conducted in Bucaramanga, Colombia, after Institutional Review Board approval was obtained. Results. Ninety children less than 5 years of age were recruited after a written informed consent was obtained from parents or guardians. Forty-five subjects served as cases with ADD and 45 as controls. Thirty-six subjects out of 90 (40.0%) were positive for at least one enteropathogen, that is, 20 (44.4%) cases and 16 (35.5%) controls. Conclusions. The three most common enteric pathogens were enteropathogenic E. coli (10.0%), Norovirus (6.7%), and Salmonella spp. (5.6%). The E. coli pathogens were 18.8% of all infections making them the most frequent pathogens. Half of ADD cases were negative for any pathogens.

1. Introduction

Acute diarrheal disease (ADD) is the most frequent cause of childhood illness and a leading cause of death in children less than 5 years of age [1]. In 2010, there were 1.731 billion episodes of diarrhea that lead to 700,000 deaths globally, mainly in low and middle income countries [2]. Most episodes of ADD are relatively mild to moderate; however about 2% of cases lead to severe diarrhea that is a risk factor for significant morbidity and mortality [2]. In addition to the risk of mortality from severe cases, recurrent episodes of ADD increase the risk of malnutrition. A recent study showed that odds of stunting increase by 1.13 times for every 5 episodes of diarrhea in children less 2 years of age [3]. Stunting is an important nutritional indicator as it represents long-term nutritional deficiency and is associated with cognitive deficits [2, 4]. In rare cases, selective enteropathogens like E. coli and Campylobacter can lead to severe morbidities (irrespective of severity of diarrhea), like hemolytic uremic syndrome and Guillain-Barre syndrome, among other conditions [5, 6].

The etiology and incidence of ADD vary in different regions of the world. The “Africa” and “Americas” regions