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Editorial
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Parasitic Diarrhea in Cuban Patients

Fidel Angel Núñez[1,2], Misladys Rodríguez-Ortega[2], Yanet Fresco-Sampedro[2] and Luis Enrique Jerez-Puebla[2]*

[1]*Department of Infectious Disease, Latin-American School for Medical Sciences, Cuba*

[2]*Department of Infectious Disease, Institute for Tropical Medicine, Cuba*

Editorial

Diarrhea continues to be a major contributing factor to morbidity and mortality worldwide. It is ranked as the second leading cause of death in children under the age of 5, and according to estimates is responsible for approximately 578,000 deaths and 1.7 billion reported episodes each year [1]. The study of Global and Regional Disease Burden Global published in 2016 showed that acute diarrheal diseases were responsible for 3.6 % of the deaths in children younger than 5 years [2]. They were also one of the leading causes of disability in young children.

Although bacteria and viruses are the main agents for pediatric diarrhea, intestinal parasites (mainly, *Cryptosporidium* spp., *Entamoeba histolytica* and *Giardia lamblia*) are also well-known etiological agents [3], the prevalence of *Cryptosporidium* in childhood diarrhea has shown an increasing trend, possibly due to use of newer and better diagnostic methods [3]. Detection rates have increased even in immune-competent healthy children. The Global Enteric Multi-centric Study (GEMS) carried out on 9,439 children with moderate-to-severe diarrhea and 13,129 control children from seven countries of Asia and Africa, attributed four major pathogens as cause of moderate to severe diarrhea [4]. Unexpectedly, *Cryptosporidium* occupied the second place, only surpassed by Rotavirus, and followed by some bacterial pathogens such as enterotoxigenic *Escherichia coli* and *Shigella;* which were found with lower frequencies of infection [4].

Among other parasitic diseases amebiasis has been highlighted as responsible for more than 55,000 deaths and 2.2 million DALYs (Disability Adjusted Life Years) in 2010 at worldwide level [5], while giardiasis produced 171,100 DALYs in the same year [6]. The precise global contribution of specific etiological agents on diarrhea and in different age groups however is not fully known [7], and in almost half the cases of acute infectious gastroenteritis it is not possible to identify the etiological agents [8].

The majority of studies have showed that parasitic infections are responsible for fewer gastrointestinal infections than bacterial and viral infections However, microscopic examination of stool samples for the detection of cysts, oocysts, and trophozoites are not always performed as they require technical expertise, are laborious; and can also be insensitive at low levels of infection [9].

In Cuba, in 1959, acute diarrheal diseases constituted the first cause of infant mortality and the fifth cause of mortality in total population [10]. Despite dramatic reductions in diarrheal disease related deaths (mortality), following the introduction of a national program in 1963, the number of diarrheal episodes is still high.

In Cuba, gastroenteritis is still a major cause of morbidity in infants and young children and accounts for a large proportion of severe episodes leading to clinic or hospital visit. In the country, systematic studies of diarrheal patients requiring hospitalization usually do not include testing for a broad panel of pathogens, especially parasites. However, several studies have suggested an important role of protozoa and coccidian among all episodes of gastroenteritis in diarrheal children younger than five years old [11,12].

Recently, a cross sectional survey was carried out in 104 adult patients with acute diarrhea who were firstly negative to cholera rapid tests. They were investigated about the possible infectious viral, bacterial and parasitic agents and only 3.85% of them were found infected with *Blastocystis* spp. Other parasitic agents were not diagnosed (data no published). Several Cuban studies of diarrheal patients carried out during the last fifteen years [10-13] analyzed with appropriated laboratory methods the presence of parasitic agents in diarrheal patients (Table 1). Only two studies were able to explore the three main groups of agent infectious; one of them was the previous study carried in adult patients and the other one in children [10], but with some limitations, because of the diagnosis

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Correspondence:
Fidel Angel Núñez, Department of Infectious Disease, Latin-American School for Medical Sciences, Carretera Panamericana km, 3½, Santa Fe. Playa, La Habana, Cuba, E-mail: fan@ipk.sld.cu

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Table 1: Main studies carried out in Cuba on diarrheal patients during the last fifteen years where parasitic diarrheas were analyzed.

Place	Quantity of included patients	Ages range (years)	Main parasitic agents found in patients with diarrhea (Frequency in %)	Date	Reference
Pediatric Academic Hospital of Cerro (Havana)*	401 children, one group composed of all 113 patients admitted because of diarrhea to the Gastroenterology division and a comparison group composed of 288 patients admitted for other reasons.	0-8	*Cryptosporidium* spp. (11.5%) and *Cyclospora cayetanensis* (4.4%)	From May to August, 1999.	[11]
Pediatric Academic Hospital "William Soler" (Havana)*	422 children who had diarrhea and were admitted to the gastroenterology service ward.	0-8	*Giardia lamblia* (7.35%), *E. histolytica*/*E. dispar* (5.69%), *Cryptosporidium* spp. (3.55 %), and *Cyclospora cayetanensis* (4.4%)	From November 2006 to October, 2007.	[12]
Three pediatric hospitals: "Juan Manuel Marquez", "Havana Centre", and "William Soler"**	110 inpatients at three paediatric hospitals in Havana, Cuba.	0-4	*Cryptosporidium* spp. (5.45%), *E. histolytica*/*E. dispar* (0.91%), *and Blastocystis* spp. (0.91%)	Between October and December, 2011.	[10]
"Hermanos Ameijeiras" Clinical Surgery Hospital*	82 adult patients with chronic diarrhea and presumptive symptoms of intestinal malabsorption.	18-85	*Blastocystis* spp. (31.7%), *E. histolytica*/*E. dispar* (8.54%), and *Cyclospora cayetanensis* (2.44%)	From March 2012 to March, 2013	[13]

*Bacterial or viral agents were not investigated. **Bacterial and viral agents were studied.

of all possible species of bacterial, and viral agents were not included. The results showed that in the pediatric population, the viruses were the main group of infectious agents, followed by bacteria and parasites [10]. In contrast in adults the main groups were bacterial agents instead of virus, followed by parasites in the third position.

The results of these studies carried out so far have highlighted the necessity to undertake new and broader researches on infectious etiology of diarrhea in different age populations from the country. In fact, new projects will be developed by our research group in order to estimate the prevalence of acute infectious diarrhea and the relationship with clinical and epidemiological characteristics in various groups of children and adults attended in some selected hospitals from the western, center and east regions of Cuba. The incorporation of some molecular methods used by our group in previous researches [14,15] to detect genotypes and species de some parasites such as *Cryptosporidium*, will improve this diagnosis. Finally, these studies will help to clarify the relative role of different groups and species of biological agents among the broad spectrum of infectious diarrheas in Cuban patients.

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