

Laboratory Investigation of Cryptosporidiosis and Giardiasis in Children with Diarrhoea; A Hospital Based Study

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Abstract— This study was conducted to determine the proportion of *Cryptosporidium* and *Giardia* infected children less than 12 years of age with diarrhoea and to identify the source of drinking water, level of hygiene in food preparation and hand washing practices of mothers/caretakers of children with diarrhoea. Children who attended to the Lady Ridgeway Hospital, Colombo 08 with diarrhoea during August to October 2012 were enrolled into the study. 145 stool samples were collected and tested them using Modified Ziehl Neelsen stain for cryptosporidium spp and microscopy of saline and iodine wet mount and Formal ether sedimentation technique for giardiasis and other parasitic infections in the laboratory. Interviewer administered questionnaire was used to collect above stated data. *Cryptosporidium* spp were detected in 48 (33%) out of 145 stool samples. There were no positives for giardiasis. Children who were more than 12 months of age were more infected with *Cryptosporidium* compared to children who were less than 12 months in age ($p < 0.05$). The level of hygiene in food preparation was adequate in 74% of the mothers/caretakers. Correct hand washing practices had been adopted by 91% of mothers/caretakers. 73% of families use public tap water as their sole source of water and they use either boiled cooled water (95%) or filtered water (5%) for drinking purpose. Although diarrhoea associated with parasitic infections is less severe compared to bacterial or viral etiological diarrhoea, presence of cryptosporidium spp in diarrhoeic samples indicate the importance of testing stool samples for cryptosporidiosis in routine diagnosis. Our results indicate a higher proportion (33%) of *Cryptosporidium* spp in stool samples collected from children with diarrhoeal illness compared to the other studies conducted locally in recent and decades ago. In the absence of an effective treatment to eradicate cryptosporidiosis from the patient, attention should be paid for preventive measures.

Keywords— *Cryptosporidium*, *Giardia*, diarrhoea

I. INTRODUCTION

Diarrhoea is the passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual (WHO, 2012). Diarrhoea can be the presenting symptom of variety of aetiological factors including infections. Infectious causes of diarrhoea are bacteria, viruses and parasites (WHO, 2012). *Giardia intestinalis* and *Cryptosporidium parvum* were the commonest parasitic cause of diarrhoea in developing countries (Snelling et al., 2007).

Acute childhood diarrhoea is one of the leading causes of childhood morbidity and mortality in developing countries (Nkrumah and Nguah, 2011). According to studies done in developing countries such as India, Ghana, Mexico and Uganda parasitic diarrhoea in children is mainly due to *Giardia intestinalis* and *Cryptosporidium parvum* (Nkrumah and Nguah, 2011, Ajjampur et al., 2010, Sanchez-Vega et al., 2006).

C. parvum a coccidian parasite, is known to cause childhood diarrhoea and travellers' diarrhoea (Jelinek et al., 1997). In otherwise healthy individuals, it may mostly pass unnoticed or may cause self-limiting water borne diarrhoea whereas immunocompromised patients may suffer from severe life threatening episodes of diarrhoea (Greenwood et al., 2007).

G. intestinalis (Syn. *Giardia lamblia*) a flagellate inhabiting the duodenum and upper jejunum, causes giardiasis commonly affecting children (Gendrel et al., 2003). In most of the instances the infection leads to asymptomatic carriage. *G. intestinalis* can cause both acute and chronic diarrhoea. Acute giardiasis presents with diarrhoea subsequently developing nausea, vomiting, bloating, weight loss and steatorrhoea etc. (Ichhpujani and Bhatia, 2002). Intestinal Malabsorption