

CRYPTOSPORIDIOSIS IN CHILDREN WITH DIARRHEA SUBMITTED TO HEALTH CENTERS IN THE WEST OF IRAN (HAMEDAN)

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ABSTRACT

There have been a few reports from Iran concerning infection by *Cryptosporidium* species, but they have referred particularly to infection in animals and their handlers. This study of infection in humans was carried out over a two year period in a large urban area in a cold region of western Iran. 554 stool specimens were examined with modified Ziehl - Neelson (MZN) staining for *Cryptosporidium* spp., along with appropriate methods for other parasites.

The infection rate for *Cryptosporidium* spp. was 5.4% in children suffering from diarrhea. In addition, seven patients were found to be co-infected by other parasites. This study revealed that *Cryptosporidium* spp. are a relatively common parasitic cause of diarrhea in this region of Iran.

Keywords: Cryptosporidiosis, Children, Hamedan.
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INTRODUCTION

Over the last few years, *Cryptosporidium* spp. have emerged as a significant enteric pathogen worldwide. Much has been learned of its epidemiology during the past few years in many countries.^{2-4,6} There have been few studies on human cryptosporidiosis in Iran until recently,^{5,11,12,16,17} other than brief reports of the infection in cattle and sheep and their attendants^{1,13-15,18} and in the native rooster.¹⁰ This report describes a laboratory-based survey from February 1989 to January 1991 which took place in pediatric clinics of Hamedan, a city in western Iran. The climate in this area is cold with a mean temperature of 9.6°C and 143 freezing days throughout the year (minimum temperature -29.8°C, maximum 36.6°C). Hamedan is a mountainous agricultural region and other intestinal parasites are very common in this area.⁷

MATERIALS AND METHODS

A total of 554 stool specimens were collected at pediatric clinics from children who had diarrhea and had been referred to the laboratory. All specimens were examined for ova and parasites by direct wet mount with saline and a formalin-concentration technique.⁸ Smears were made both from fresh feces and from concentrated material and were stained with a modified Ziehl-Neelson (MZN) method.⁹ Modifications were made on the MZN stains of a series of smears (50% of specimens) for comparison (decolorization of stained slides was performed with 5% sulfuric acid for 10-15 seconds, slides were washed with tap water for 10-15 minutes and the heating step was omitted).

This simplified and rapid method gave very good results which did not significantly differ from the standard MZN method ($P < 0.001$). One smear from each

Cryptosporidiosis in Diarrhea

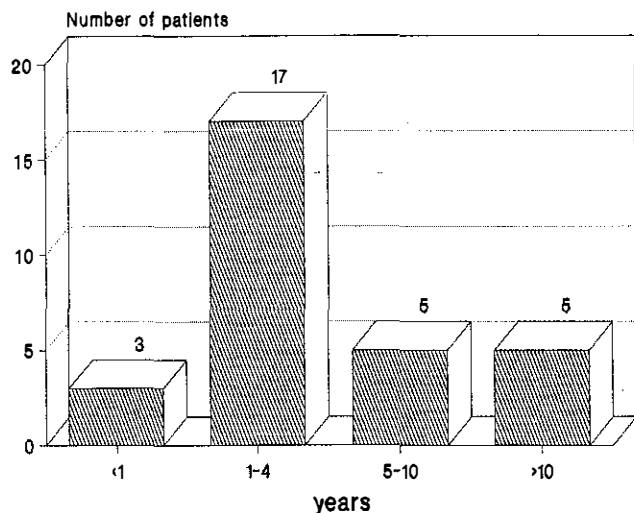


Fig. 1. Age distribution of 30 patients with cryptosporidiosis.

specimen was also stained by Giemsa.

The past history of the patients, including weight at birth, contact with pets, feeding method of infants, details on drinking water, weight loss and other factors related to patients were recorded.

RESULTS

Of 554 patients examined, 30 had oocysts in their feces and seven also had other parasites (2 *G. lamblia*, 2 *A. lumbricoides* and three had both parasites together). Age distribution was between two months to twelve years with peak incidence from one to four years of age (Fig. 1). 17 cases were female and 13 male. Mean duration of diarrhea was seven days, ranging from three days to two months. Frequency of bowel movements was two to ten times per day. Oocyst excretion, determined microscopically, usually ceased by nine days after the symptoms had resolved. Symptoms included diarrhea, abdominal pain, fever, anorexia, vomiting, malaise, headache and flatulence (Fig. 2).

Half of the children were otherwise normal and others had weight loss during the illness; 50% of patients were breast fed during infancy, 13% breast fed in addition to formula, and others were given cow milk. The water source was tap water in 53%, well water in 33% and both in 14%. Six patients had pet or other animal contacts (sheep, cattle and poultry).

DISCUSSION

Since this study was carried out in only one limited part of Iran, it cannot be assumed to indicate the

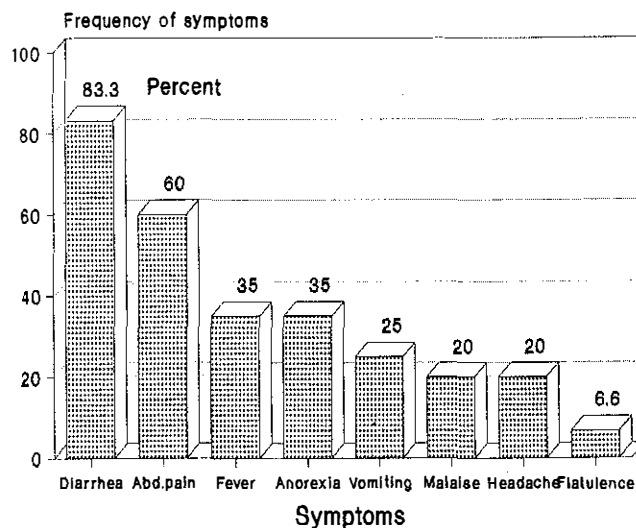


Fig. 2. Symptoms in children with cryptosporidiosis in Hamedan.

prevalence of cryptosporidiosis in all parts of our country. Our findings, including symptoms of illness and age distribution are, however, generally consistent with other reports from developing countries,^{2-4,6} especially Kenya,¹⁹ and other parts of Iran,¹⁷ except that direct animal contact seems to have occurred less often and most cases were symptomatic. An interesting point in this study is the different climate of this area, and that most of our cases were diagnosed during fall and winter. Most infections were found in children who had consumed tap water, which has been implicated in the transmission of other parasites. Thus, although the infection may be transmitted from person to person, it may also be a water-borne disease in this region; this assumption needs further evaluation with analytical methods for confirmation.

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