

Cryptosporidiosis In Hospital Acquired Diarrhea

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Summary:

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One hundred eighty five stool specimens were collected from hospitalized patients aged from one month to sixty five years suffering from diarrhea after admission in the hospital, 35 healthy contact control (hospital staff), and 50 hospitalized patients not complaining of diarrhea during the period of admission and considered as patients control group were included in this study. Samples of hospital tap water was tested for identifying *Cryptosporidium parvum* as a source of waterborne infection which contributed with nosocomial infection. Hospital floor cleaning water was also tested for identifying *C. parvum* as a cause of environmental contamination. The rate of cryptosporidium infection among cases with nosocomial diarrhea was 12 (6.5%). There was no significant difference between the rate of infection with cryptosporidiosis in diarrheal cases and both healthy contact control (2.9%) in cases with diarrhea and patients control (0%) ($P > 0.05$).

The association of cryptosporidium with other microorganisms, among the 12 cases with cryptosporidiosis showed that 3 (25%) had also positive evidence of rotavirus and 6 (50%) had evidence of other intestinal parasites which cause diarrhea.

The rate of positive cryptosporidium among cases with diarrhea showed no statistically significant differences between different age groups or between males and females ($P > 0.05$).

Key words: Cryptosporidiosis. Cryptosporidiosis in hospital personnel

Introduction:

Nosocomial Or Hospital-acquired infection is a disease that develops during admission to hospital (Wenzel *et al.*, 2002). Nosocomial diarrhea is increasingly recognized as a difficult problem for bedridden patients as well as hospital personnel (Llughes and Jarvis, 1987). One of the major enteropathogenic parasite is *Cryptosporidium parvum*. The agent of human cryptosporidiosis, it is an enteric coccidian protozoan parasite (Current and Garcia, 1991), that belongs to Apicomplexa phylum is now well recognized as a common cause of acute or severe diarrhea and some times fatal infection in humans (Meinhardt *et al.*, 1996; Benenson, 1995).

Nosocomial infection caused by this protozoan have been described by many workers (Dryiauski *et al.*, 1986; Koch *et al.*, 1985; Baxby *et al.*, 1983). But the frequency, sources and modes of transmission of this infection in the hospital remain unclear (Ravn *et al.*, 1991).

PATIENTS AND METHODS

1-study groups

One hundred eighty five hospitalized patients aged from one month to sixty five years suffering from diarrhea after admission in the Hospital. Thirty five staff workers in the medical and pediatric ward (nurses, floor service workers, food

handlers) considered as healthy contact control group. Fifty hospitalized patients not complaining of diarrhea during the period of admission and considered as Patient control group.

2-samples

-Stool specimens were collected from each individual included in this study

-water samples (Hospital. tap water and floor - cleaning water) was tested for identifying *Cryptosporidium parvum*

3-Methods of Examination.

-Parasitological Examination (Macroscopic and Microscopic Examination)

-Staining Method (Modified Acid – fast stain -filtration Method for water samples by using milipore filter.

RESULT

As show in table(1) the prevalence of cryptosporidiosis among cases with nosocomial diarrhea was (6.5%), It was higher than both healthy healthy contact control and patients control (2.9%,0%), respectively.

table(2) shows the risk of having cryptosporidiosis was not affected by age groups and gender. The peak incidence of cryptosporidiosis (8.6%) in age group ≥ 50 years.

table(3) shows the association of *Cryptosporidium parvum* with other microorganisms (25%) of positive cryptosporidium had also a positive evidence of rotavirus and (50%) had a positive evidence of other microorganism.

Table(4) shows The rate of positive cryptosporidium increased from 1.2% in patients

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diarrhea was 12 (6.5%). Although the prevalence of cryptosporidiosis was obviously higher among cases with diarrhea than both healthy contact controls (2.9%) and patients control (0%), it failed to reach the level of statistical significance (possibly because of small sample size). In our opinion relatively the incidence of hospital acquired cryptosporidiosis may be due to the patients with active diarrhea previously admitted to the hospital potentially contaminate the environment, or asymptomatic carriers could serve potentially as a risk for transmission to other patients in the hospital setting by indirect transmission or directly by patient –to– patient transmission as well as a nurses may play a role in transmission of cryptosporidiosis from infected patients

As shown in table (3) among cases with nosocomial diarrhea and (12) positively identified cryptosporidium, 3 (25%) had also a positive evidence of rotavirus, but 6 (50%) had a positive evidence of other microorganisms (*E. histolytica*, *G. lamblia* and *Monilia spp.*). Similar results were observed by Shariff *et al.*, 2003. Mixed infection suggested the possibility that some type of synergism can exist between special groups of parasites and/or bacterial and viruses., this may depend on the nature and number of organisms present, the host age, nutritional status and susceptibility to invader (Guardiola *et al.*, 1961). In our opinion the modes of transmission and epidemiologic patterns of cryptosporidium and other microorganisms included in the study may play a role in mixed infection.

The risk of cryptosporidiosis was 14.8 times higher in those with longest duration (8 day and above). Although nosocomial acquisition of parasitic infection may not distinguished easily while exogenous infection or reactivation of latent infection, the usual known incubation period of an infectious agent is important in determining whether a given infection is nosocomial, the interval between the times of admission and the onset of clinical symptoms must be longer than the known minimum incubation period of the infectious agent (Dupont *et al.*, 1998). In the present study although no definite proof could suggested that the infection with cryptosporidiosis is hospital acquired or not, the rate of positive cryptosporidiosis increased with longest duration (8 day and above) may confirms the hypothesis that cryptosporidiosis is a hospital acquired infection because the development cycle of cryptosporidium is completed in approximately 3 days (range 1-8 days)

the highest incidence of identified cryptosporidium oocysts in the study groups and in the water was occur during May 2003, these results may point out to a possible relation between the rise in number of hospital acquired

cryptosporidiosis and water used for cleaning and drinking purposes as a possible source of infection spread in the hospital setting.. Within this finding drinking water may be seriously considered as an important mode of transmission of hospital acquired cryptosporidiosis. We concluded that in addition to person – to – person transmission, water contamination may have contributed to hospital acquired infection. A waterborne infection may be due to a breakdown in the pipes that connecting the water system resort the public supply and this due to the war events. Hospital patients are exposed to waterborne microorganisms when showering, bathing and drinking water and by contact with contaminated medical equipment rinsed with tap water.

Hospital floor cleaning water was also contributed with nosocomial infection as a source of environmental contamination

Conclusion

From this study we conclude that cryptosporidiosis considered to be an important medical problem as a hospital acquired infection. Although rotavirus and other cases was obtained in an obviously higher proportion of cases with diarrhoea.

Cryptosporidium could be transmitted directly person - to - person perhaps via health care workers or indirectly via contaminated devices, environment or food.

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