Acute diarrhoea in paediatric age group - A clinico-microbiological study

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Abstract: Child health care has been given prime priority by national health care system organisations. However, acute diarrhoea is still a leading cause of childhood morbidity and mortality. One in four deaths in children under 5 years is due to acute diarrhoea. This study was aimed to assess the microbial profile of acute diarrhoea in paediatric age group patients. A total 380 acute diarrhoeal cases and two hundred non diarrhoeal control subjects were selected and stool sample was collected. All samples were undergone for microbial examination. Bacterial enteropathogens belonging to 6 species were isolated in 40.7% of diarrhoeal cases such as E.coli in 21.7%, Shigella in 7.9%, Klebsiella in 1.1%, Campylobacter in 5.8%, Salmonella in 1.6% and Pseudomonas in 1.1%, G. Lambiia and E.histolytica were found in 3.2% and 2.6% respectively. Mixed agents were found in 2.6% cases. Rotavirus is an important cause of acute diarrhoea, found in 18% of children below 5 years of age. With the reference of above results that E.coli is predominant enteropathogens leading to diarrhoea and Shigella is another major contributor to the diarrhoea. Improving the use of ORT, practice of hand wash, community health education, sanitation and water supply improvement and rapid implementation of anti-diarrhoeal vaccines may help to prevent the acute diarrhoea.

Keywords: Acute diarrhoea, E.coli, Shigella, Rotavirus

INTRODUCTION

Acute diarrhoeal diseases in children constitute a cardinal health problem in developing countries, where it is associated with high mortality and morbidity [1]. Studies from developing countries have shown that children under 5 years of age experience on an average 2-3 episodes of diarrhoea every year [2]. In several developing countries 40 percent of hospital admissions are accounted by acute diarrhoeal diseases, with a case fatality rate of 2.5 to 9.5 percent [3]. WHO child health epidemiology reference group estimates that 16% of deaths in African infants are less than five years by acute diarrhoea [4].

Most of acute diarrhoeas are infectious in origin. Among the causative agents that have been associated with paediatric diarrhoeal diseases in developing countries relatively few account for most diseases [5] such as rotaviruses, enterotoxigenic E. coli, Enteropathogenic E. coli, Shigella and Vibrio cholerae.

Aetiological studies of diarrhoeal disease are necessary to define the relative importance of various enteropathogens in a population and to direct therapeutic and preventive efforts for reduction of impact of these illnesses in a population [6]. However, for care of individual patient precise aetiological diagnosis is not essential. As oral rehydration therapy is the treatment of diarrhoeal disease of all ages and causes [7]. Enteric infection causing diarrhoea is generally selflimiting. However, diarrhoea caused by Shigella, V.cholera, Giardia and E. histolytica are effectively treated by antimicrobial drugs and only patients with these infections would clearly benefit from aetiological diagnosis and specific therapy [8]. The present study was aimed to evaluate the clinico microbiological profile of acute diarrhoea in paediatric age group patients.

MATERIAL AND METHODS

This study was carried out in the department of microbiology, Rajiv Gandhi Institute of Medical Sciences, Ongole. A total of 380 children in the age group of 1 to 5 years with acute diarrhoea were selected from paediatrics outpatient. Infants below 1 month age were excluded. Two hundred non-diarrhoeal age and sex matched controls were selected from admitted patients for minor illness like asthmatic bronchitis.
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In the present study rotavirus was detected in 18% children suffering from acute diarrhoea using ELISA technique. The results obtained in the present study are in agreement with many studies conducted in India. Samantray et al. and Bhan et al. reported prevalence of rotavirus in an urban slum community in to be 21.2% and 20.3% respectively [9, 10]. Mohandas et al. in his study observed 19% acute diarrhoeas were due to rotavirus [11]. Bhat et al. and Sen et al. have reported similar incidence of rotavirus in hospitalized children (18.3%, 15.9% and 16.3% respectively) [6, 12]. Various authors have reported higher detection rates of rotavirus in patients with acute diarrhoea requiring hospitalization [9, 13]. This is because rotavirus disease has not greater potential to cause dehydration [14].

In the present study shigella was isolated from 15 patients out of 189 patients studied giving a prevalence of 7.9%. The isolation rate of shigella in the present study was consistent with the findings of Feldman et al., Sanyal et al., Agarwal et al., gupta et al. and lesser Bhat et al. (20.6%) and Santhana Krishnan (22%) [15-19, 9]. The difference in isolation rate varies according to epidemiological setting of study. In the present study isolation of salmonella was low. 1.6% which is consistent with many Indian studies by Bhan et al. (2.5%), Mohandas et al. (3%), and Sen et al. (0.9%), [10-12]. In the present study difference between isolation rate of C. jejuni from patients with diarrhoea and from controls is not significant. This is in agreement with most of the studies from India and Bangladesh. Studies by Blaser et al. from Bangladesh

Almost identical organisms were detected in both the groups. Rotavirus was detected in 26.1% and 22.3% cases in breast fed and bottle fed children respectively. Prevalence of shigella was apparently higher in bottle fed children as compared to breast fed children; similarly campylobacter was detected more frequently in bottle fed cases. But these differences were not statistically significant. Klebsiella and Pseudomonas were present in one bottle fed and none breast fed cases.

**DISCUSSION**

Acute diarrhoea diseases are an acknowledged major health problem, severely effecting the children from developing countries, but important to all countries of the world. This disease is perhaps the biggest child killer in developing countries, still 3.5 million children mainly in developing countries die every year due to diarrhoeal diseases. In India alone about 1 million children die of diarrhoeal disease every year.

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(12% and 14% in patients and controls respectively) [20].

In the present study E.Coli was cultured and shows a predominant growth in 21.8%. Children with acute diarrhoea and in 11% non-diarrhoeal controls. Agarwal et al. reported 60.6% showed E. Coli growth among 21.2% were typable, Sarkar et al. 37% showed E. Coli growth among 58.8% were typable and Paul et al. isolated E. Coli in a pure culture in 30.6% cases and 22.6% controls [17, 21, 22]. Isolation of E.Coli as predominant growth culture was lower in comparison to previous studies due to intake of antibiotics by the patients.

Isolation rate of Entamoeba histolytica (3.2%) and Giardia lamblia (2.7%) remained low in present study. Lower isolation of G. Lamblia and E. Histolytica in present study is consistent with studies of Sen et al., Bhan et al. and Mohandas et al. reported 5% prevalence of G. lamblia in acute diarrhoea in young children [10, 11, 12]. In present study G. lamblia and E. histolytica were not isolated in infancy; isolation rate was relatively higher after two years of age.

CONCLUSION
Rotavirus is an important cause of acute diarrhoea in children particularly below 2 years of age. Rotavirus accounted for 18% diarrhoeas in children under 5 years of age in the present study. Bacterial enteropathogens accounted for 40.7% cases of diarrhoea. Commonest among them were E. coli (21.7%), Shigella (7.9%) and Campylobacter (5.8%). There was no significant difference in isolation rates of campylobacter from diarrhoeal and non - diarrhoeal children. Diarrhoea due to Vibrio cholerae is probably rare in this region as V. cholerae was not detected in any case in the present study. G. lamblia and E. histolytica were not common as a cause of acute diarrhoea in children.

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