Etiological spectrum and complications of acute diarrhoeal diseases in adults

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ABSTRACT

Background: Acute diarrhoea is a very common problem, prevalent in all the countries and climates. An estimated 4.6 billion cases of diarrhoea occurred worldwide in 2004, resulting in 2.2 million deaths. It is more common in tropics and endemic in India. Though several studies were done in India and elsewhere on the problem of infantile diarrhoea, adult diarrhoea has not been studied extensively.

Aim: We sought to identify predictor's spectrum and complications of acute diarrhoeal diseases in adults.

Material and methods: Hundred consecutive patients who sought care in a tertiary care teaching hospital with acute diarrhoea were included in the study. Outcome of clinical characteristics and laboratory investigations were reviewed.

Results: In 73% cases, no pathogens could be isolated. Cholera was isolated in 13% of cases, 12% being eltor and 1% classical biotype. The commonest complications observed were hypovolemic shock (11%) and acute renal failure(ARF) (8%). More than 50% of hypovolemic shock patients had ARF. Cholera was associated with more complications. The overall mortality was 2%; both had cerebrovascular accident (CVA).

Conclusions: The present study highlights the overall role of pathogens as causes of acute diarrhoea in adults in northern parts of Karnataka. Several interesting clinical observations, relating to the pathogens identified, have been reported. Further research is required to determine the frequency of specific organisms during each season.

Keywords: acute diarrhoea; cholera; acute renal failure, hypovolemic shock

INTRODUCTION

Acute diarrhoea is one of the most common afflictions of mankind.[1] It is a universal health problem affecting all the age groups throughout the world especially the third world, responsible for sizeable morbidity and mortality. With improvement in the economic status and extensive availability of health care and safe water supply, developed countries do not see diarrhoea epidemics recently. In contrast, the developing countries are still facing the wrath of this endemic.[2] Acute diarrhoea is second to respiratory infection as the leading cause of mortality due to infections on a worldwide scale. Worldwide, approximately 4-6 millions deaths occur every year due to diarrhoea.[2] In India, acute diarrheal diseases accounts for about 13% of deaths in under 5 years age group. During the year 2009, about 11.2 millions cases with 1762 deaths were reported in India.[2]

In paediatric age group, diarrhoeal disease is related to unhygienic methods of feeding, poor sanitation, ignorance, poverty, superstitious beliefs and associated malnutrition. Lack of proper communication, transport facilities and non availability of health care facilities are responsible for the development of complications like severe dehydration, electrolyte abnormalities, hypotension, shock and renal failure. The pattern of diarrhoeal disease and causative organisms vary from region to region and also in the same region during different seasons.

With improvement in existing diagnostic methods, advances in epidemiology, and advent of new diagnostic kits, the control of acute diarrhoeal disease appears to be an achievable task. As it is also one of the common conditions seen in northern part of Karnataka, an attempt is made to study the aetiology and complications of acute diarrhoeal diseases in adult patients.

MATERIALS AND METHODS

One hundred consecutive patients admitted with

acute diarrhoea over a period of 12 months in medicine wards consisted the study population. Detail history, clinical examination and investigations mentioned below were done in all the cases. The results were analyzed and descriptive statistics was used.

Inclusion criteria: All the adult patients (age ≥15 years) presented with increased frequency of stool, three or more times a day, of duration less than 14 days and had not taken antibiotics in the week preceding stool sampling were included in the study. **Exclusion criteria:** Patients presenting with pseudo diarrhoea and faecal incontinence.

Data was collected by using proforma meeting the objectives of the study. Purpose of the study was explained to the patients and informed consent was obtained.

The following investigations were done in all the patients: Complete hemogram, blood urea, serum creatinine, serum electrolytes like sodium, potassium and chloride, and stool examination. Wherever indicated, stool culture, blood culture, liver function test and tests for HIV status were done.

Statistical methods: Analysis of variance has been used to find the significance of clinical and biochemical parameters between mild, moderate and severe level of dehydration status.

Statistical software: The statistical software namely SPSS 15.0, STATA 8.0, MEDCALC 9.0.1 and SYSTAT 11.0 were used for the analysis of the data and Microsoft word and excel have been used to generate the graphs and tables.

RESULTS

Out of 100 patients of acute diarrhoea studied, 57 were males and 43 were females. The age of patients varied from 18-90 years. Maximum incidence (60%) was seen in age group of 21-50 yrs. Majority of the patients (69%) had loose stools of < 24 hours duration prior to admission, followed by vomiting (76%) and fever (30%). All the patients showed varying degrees of dehydration. Status of dehydration was assessed according to World Health Organisation (WHO) guidelines.[3] At the time of admission 42% showed mild dehydration, and 29% each were moderately and severely dehydrated. In patients with mild dehydration, pulse rate was 87.80 ± 14.94. In moderately dehydrated patients, pulse rate was 92.55 ± 10.83 and in severe dehydrated patients, it was 103.23 ± 10.69. In mild dehydrated patients, systolic and diastolic blood pressure (BP) was 120.035 ± 19.49 and 78.82 ± 12.43 respectively. In moderate dehydrated patients, systolic and diastolic BP was 97.29 ± 24.27 and 67.10 ± 15.32 respectively. In severe dehydrated patients, systolic and diastolic BP was 78.80 ± 19.16 and 66.00 ± 15.17 respectively. All hemodynamic parameters studied are statistically significant.

In present study, Cholera was isolated in 13 cases, Giardiasis- 6 cases, Hookworm ova -5 cases, and Aeromonas, Shigella, and Isospora were isolated in 1 case each whereas no pathogens could be isolated in 73 cases by routine stool examination and stool culture (Table-1).

In the present study, hypovolemic shock was seen in 11 patients, acute renal failure(ARF) in 8 and both hypovolemic shock and ARF present in 17 patients. Other complication include dyselectrolytemia (3 cases), and cerebrovascular accident (2 cases) (Table-1).

Table 1: Pathogens and related complications

Diagnosis	Number of Patients	Complications			
		Hypovolemic Shock+ARF	ARF	Dysele-trolytemia	CVA+ ARF
Aeromonas	1	0	0	1	0
Cholera	13	4	1	3	1
Giardiasis	6	1	0	1	0
Hookworm	5	0	0	0	0
Isospora	1	1	0	0	0
Shigella	1	0	0	0	0
No pathogens	73	05	07	12	4

DISCUSSION

Diarrhoeal pathogens in adults have infrequently been the subject of investigations in developing countries, and little is known about the etiologic epidemiology of pathogens other than epidemic Vibrio cholera and Shigella[3]. Though several studies were done in India and elsewhere on the problem of infantile diarrhoea, adult diarrhoea has not been extensively studied of late.

In our study of 100 patients, maximum numbers of cases (78) were seen in the age group of 21-60 years with a male preponderance. In our study no pathogens were isolated in 73% cases. These findings are comparable to a study done by Krishnamurthy et al., where no pathogens were isolated in 76% of total cases studied.[4] This could be due to the possibility of viral aetiology and we could not confirm these by routine tests. Cholera was the most common isolated organism (13%) with eltor biotype (92.3%) predominance. This correlates well with a study by Niyogi SK et al., where they isolated 99.5% eltor biotype.[5] Das et al., in their study conducted over a period of 3 years also found Vibrio cholera as common pathogens (56.1%).[6] Jewkes et al., however, in their study showed E. Coli as the most common organism.[7] Besides the well known causes of diarrhoeal diseases, parasites and viruses are important etiological agents, which are often overlooked. Parasitic yield from stool examination in our study showed Giardia intestinalis (6%), hookworm (5%) and isospora (1%) which was found in HIV seropositive patient. This correlates well with the study by Das et al.[6]

Correlating the presenting symptoms with the organisms identified has led to several interesting observations. Cholera positive patients presented with severe acute watery loose stools. The subset of patients where no pathogens were identified, presented with fever and diarrhoea. Patients with giardiasis presented with abdominal pain and diarrhoea. Shigella positive patient presented with more of bloody diarrhoea. Similar observation was highlighted by Chan et al.[8]

In our study dehydration was noted in all 100 cases which are similar to a study conducted by Rao et al.[9] This probably is due to the fact that this study included only inpatients and patients without dehydration or mild diarrhoea were not admitted. In our study mild dehydration was noted in 42% of cases. Moderate and severe dehydration was noted in 29% and 29% respectively. Krishnamurthy et al., noted mild dehydration in 33.33% of cases.[5] Rao SV et al., reported moderate and severe dehydration in 59% and 41% cases respectively which is slightly higher than our study.[9] This is probably due to regional influences, lack of knowledge, attitude and practice of patients. Overall mortality was 2% in the present study, whereas it was 4.3% in the study done by Krishnamurthy et al.[4]

Limitations of the study: Larger samples are required to determine specific pathogens during each season. Viral aetiology could not be confirmed because of lack of facilities in our setup.

CONCLUSION

The present study concludes the overall role of pathogens as causes of acute diarrhoea in adults in this part of Karnataka. Several interesting clinical observations, relating to the pathogens identified, have been reported. Further research is required to determine the frequency of specific organisms during each season.

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