



CLINICAL STUDY OF ACUTE GASTROENTERITIS IN CHILDREN AT TERRITORY HEALTH CENTRE

Paediatrics

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ABSTRACT

Introduction: Globally around one billion episodes of illness and 3-5million deaths occur as a result of diarrhoeal disease each year. Eight out of ten of these deaths occur in first two years of life. In developing countries, on an average every child suffers 3.3 episodes of diarrhoea per year, but in some areas the average exceeds 9 episodes per year. In India children under 5 years of age suffer from 2-3 episodes of diarrhoea annually. **Materials and Methods:** Children from 6 month to 2 years of age with history of acute diarrhoeal episode (less than 14 days duration) admitted to the pediatric wards in Amaltas Medical College and Hospital Dewas. A total of 125 cases were included in the study for the period Results: In this study majority of cases occurred between 6-24months of life. Majority (85%) of children were on artificial feeds with or without breast milk. Poor sanitation was seen in 67.33%. 51% were malnourished. Stool culture was positive in 50.66%. Among stool culture positive cases, 43.42% had fever at admission Pus cells more than 10/HPF was present in 36.84% of culture positive patients. Conclusion: The incidence of acute gastroenteritis in children above 1 month and below 5 years in our study was 12.24% of all pediatric medical admissions. The incidence was more during the second half of the infancy (45%). There was no sex predilection in our study.

KEYWORDS

Acute gastroenteritis, Dehydration, Stool culture etc.

Introduction

Diarrhoeal disorders are one of the oldest known disorders to mankind. It is called Vishuchka in ayurveda and has been clearly described in Sushruta samhitha of 7th century B.C. Hippocrates has recorded diarrhoea in the Greek writings.¹ Globally around one billion episodes of illness and 3-5million deaths occur as a result of diarrhoeal disease each year.² Eight out of ten of these deaths occur in first two years of life.³ In developing countries, on an average every child suffers 3.3 episodes of diarrhoea per year, but in some areas the average exceeds 9 episodes per year.⁴ In India children under 5 years of age suffer from 2-3 episodes of diarrhoea annually.⁵ In India 17% of all deaths in indoor patients are diarrhoea related.⁶ The high incidence of morbidity and mortality in diarrhoea is related to malnutrition, poverty, poor education, low socio-economic status, bad sanitary conditions, and trends of early breast milk substituent and bottle-feeding. Repeated attacks of diarrhoea also aggravate the compromised nutritional status of under privileged children, with a consequent heightened susceptibility to infectious diseases. Hence diarrhoea is an important contributing factor for malnutrition, which in turn predisposes the child to further diarrhoea, thereby initiating a vicious cycle.⁷ In this dissertation an attempt is made to study the clinical and bacteriological aspects in acute diarrhoea in children during 14months period. Aim of the study to know about the clinical features of acute diarrhoea in children and know the common bacterial pathogens isolated in cases of diarrhoea and to correlate clinical profile, isolated bacterial pathogens, morbidity and mortality.

MATERIALANDMETHODS

Children from 6 month to 2 years of age with history of acute diarrhoeal episode (less than 14 days duration) admitted to the pediatric wards in Amaltas Medical College and Hospital Dewas. A total of 125 cases were included in the study for the period from March 2021 to August 2021.

Method of collection of data: Detailed history followed by thorough physical examination.

Sampling procedure: All the children above 6 month of age and below 2 years of age presenting with acute diarrhoea and fulfilling the inclusion and exclusion criteria were included in the study.

Table 01: Inclusion criteria and Exclusion criteria of the study.

Sr No.	INCLUSION CRITERIA	EXCLUSION CRITERIA
1	Abrupt onset of four or more loose stools per day	All cases who received antibiotics before collect of stool sample were excluded

2	Less than 14 days duration	Children less than 6 month
3	Age between 6 month to 2 years.	Children more than 2 years

Procedure after case selection:

1. A detailed history was taken and clinical examination performed as per the proforma.
2. Evaluation of degree of dehydration was done according to the proforma.
3. Blood samples were collected for routine hematological indices Hb%, T.C. DC. Septic screen - count of W.B.Cs. Band counts CRP. Blood culture in suspected cases of septicemia Blood samples were collected before starting the therapy
4. Two samples of stool were collected, one sample in a sterile bottle for microscopic examination, for leucocyte. The other sample in a sterile test tube for culture and sensitivity study and hanging drop preparation.

Procedure for taking stool for culture:

After the admission the perineum was cleaned thoroughly with sterile swabs, after washing the hands with soap and water. The stool was collected in sterile bottle or a sterile swab which was kept in a sterile test tube was introduced into the rectum for nearly 2 to 2.5 inches and the sample thus taken was introduced into alkaline peptone water bottle. This was then immediately taken to the Microbiology department. For cases admitted during the evening, night or early morning hours, the 48 samples collected were kept in the refrigerator at 40 C till the bacteriology department opened.

STATISTICALANALYSIS

Data entry and statistical analysis was performed with the help of SPSS version 20. Chi-square test was used for the analysis of the data. The P value 0.05 was considered highly significant.

RESULTS

This study was conducted between March 2021 to August 2021 among children between 6 months and 2 years with acute gastroenteritis who had a positive stool culture. Of the 1400 admissions in the paediatric ward, 190 cases were admitted for acute gastroenteritis. So the incidence of acute gastroenteritis in children was calculated to be 8.9%.

TABLE 02: Age distribution of the study population

AGE IN MONTHS	NO. OF CASES	PERCENTAGE
6-12	89	71.2 %
13-18	19	15.2 %
19-24	17	13.6 %
Total	125	100 %

Maximum number of children in the study population belonged to 6 - 12 months age group followed by 12 - 18 months and 18-24 months respectively. The number of children in each age group is shown in Table 2.

TABLE 03: Sex distribution of the study population

SEX	NO. OF CASES	PERCENTAGE
Males	68	54 %
Females	57	46 %
Total	125	100 %

In the present study, the incidence of acute gastroenteritis was more among males than females. The distribution of cases among both the genders is shown in Table 3. The male to female ratio was 1.17: 1.

Table 4: Clinical characteristics of children with acute diarrhoea.

CLINICAL CHARACTERISTICS	NO. OF CHILDREN	PERCENTAGE
FEVER	113	90.4%
VOMITING	9	54.4%
FREQUENCY OF DIARRHOEA < 5 TIMES / DAY	68	64.4%
5 - 10 TIMES / DAY	30	24%
> 10 TIMES / DAY	15	11.6%
DEGREE OF DEHYDRATION		
NO DEHYDRATION	27	21.2%
SOME DEHYDRATION	81	64.8%
SEVERE DEHYDRATION	18	14%

The clinical features seen in the children were fever, vomiting, diarrhoea and dehydration. Children with diarrhoea were again classified according to the frequency as less than five times a day, five to ten times a day and more than 10 times a day. Similarly dehydration was classified as, children with no dehydration, some dehydration and severe dehydration.

TABLE 05: Prevalence of Various Bacterial Enteropathogens Identified In Children with Acute Gastroenteritis

PATHOGENS	NO. OF CASES	PERCENTAGE
E COLI	28	22.4%
SALMONELLA	18	14%
SHIGELLA	10	8%
KLEBSIELLA	10	8.4%
NO GROWTH	59	47.2%

All stool samples of children with acute gastroenteritis were subjected to stool analysis and the prevalence of various pathogens in them are shown in Table 05.

The educational status of the mothers was compared with the frequency of diarrhoea in children. Chi square test was done for comparison. Statistically it was seen that lesser the education, more the chance of increase in frequency of diarrhoea. It might be because mother's education has an influence on sanitary practices and understanding of the disease. History of feeding practices of the child were taken. Feeding practices of the child was compared with the presence of either bacterial or probable viral infection in them. For the purpose of this study, no agent in stool culture was considered to be viral diarrhoea. Chi square test was done which showed that viral diarrhoea was common among the children who were only breast fed and where no other feeds were given.

DISCUSSION

Diarrhoeal diseases in the paediatric population are a major cause of mortality globally and more in the developing countries. With the advancement in medical sciences the inner secrets of their disease are being understood and a better way of management is at our disposal. The incidence of gastroenteritis in the present study was 8.9% of the total admissions. Patel B D⁸, Pavri K M⁹, Manchanda SS¹⁰, reported an incidence of 17.5%, 22.5%, and 18%, respectively. The incidence of diarrhoeal disorders in children as seen in the above studies varies roughly from 5.5% to 24.6%. This study was also between these ranges.

According to Gandhi VK¹¹ from Jamnagar in a two years study, gastrointestinal disorders accounted for 17.4%, of total pediatric admissions out of which gastroenteritis accounted for 91.14%. Most diarrhoeal episodes occur during the first 24 hours of life. Incidence is highest in the age group of 6 to 11 months when weaning often occurs. In the present study the maximum number of cases belonged to the group of 6 to 12 months 71.2% which is very similar to the above fact. Studies done by Arora, Sood, Behera S K, Josh C K reported higher incidence of acute diarrhoea below two years and they were 72%, 91%, 77.5% and 73.8% respectively. The high incidence of diarrhoeal diseases in this age group of life is probably related to faulty weaning, unhygienic handling and storage of milk and food, higher incidence of parenteral infection, malnutrition, development of mouthing habits of this age as suggested by Khanduja et al and Sood S. To these factors can be added immaturity of the immune system of the body rendering it susceptible to an attack by the enteric pathogens, especially in association with malnutrition. In this study, the male to female ratio was 1.17: 1. Almost similar observations were made Karmarkar et al (M:F = 1.083), Victor Cardens et al where M:F=1.077. According to Behera et al, Naruka B S, Pavri and Sood, diarrhoea was twice as common in males as in females. However Sethi and Thankamoni have reported no sex difference. Actually, it is difficult to obtain a valid explanation for a higher male incidence. This could possibly be attributed to our unfavourable social outlook, ignoring and neglect, the ailments of female children and bringing mostly the boys to hospital. Seasonal variation of the study sample showed that maximum number of cases occurred during April 29, May 31 and June 27. Similar observations were reported by Naruka B S et al who quote 75.2% of diarrhoeal admissions during the months of May to September and 24.8% in the remaining six months. In a study by Srivastava J R in 1968 and Datta W D, half of the total admissions were in May to August. The high incidence in summer is said to be due to free growth of saprophytic organisms in the contaminated food and also multiplication by bacteria in milk and food. The high incidence in the beginning of the rainy season is said to be due to fly season which is seen during and after light rains when flies act as vector. Manchanda and Arora reported that 31.2% of all diarrhoeal children were on breast milk and 68.8% were on artificial feeds with or without breast milk. Naruka B S et al found the incidence to be 32.5% and 67.5% and sood reported 23% and 77% respectively. In this study 26 (10.4%) of the cases were exclusively breast fed and the remaining 224 cases (89.6%) were receiving artificial feed with or without breast milk. Malnutrition of varying grades was present in 94 (37.6%) cases in the present study. Khanna K K reported malnutrition in 64.5% of their patients. In a study by Udani et al, nutrition was good in 11.3% cases, fair in 49% cases and poor in 39.7% cases. In a study done by Achar et al, malnutrition of varying grades was seen in 81% of the cases which differs from our study. Behera S K et al, Shrivastav A K, and Damin G S have reported malnutrition in 89%, 76.35% and 61% respectively in their studies. Poor nutrition is associated with more serious diarrhoea and the episodes tend to be prolonged.

Diarrhea : a) Frequency of diarrhoea : The mean frequency of diarrhoea in the present study was 4.7 stools per day. This frequency differs from a study conducted by Dutta P et al which reported the frequency of diarrhoea to be 7.8. However Chaomin Wan et al and Anthony et al reported a mean frequency of 15.66 and 13.09 stools per day respectively.

b) Features of stool: In a majority of cases there was no blood in the stool (91.6%). Only 8.4% had blood in stools. This is close to a study done by Ghai O P who reported it to be around 6%. This study differs from studies done by Naruka et al and Mittal S K et al who reported blood in 1.2% and 4.21% only.

It was seen from the present study that if there was higher frequency of stools, it causes severe dehydration and vice versa. But this fact is not always true. This is because, the child who passes only less frequency of stools a day and large quantity each time may be severely dehydrated than the one who passes more frequently but small quantities each time. But if a child is passing stools more frequently and in large quantities each time the severity of illness naturally increases. In this study 68 cases (54.4%) presented with vomiting. Study done by Prasad R reported that the incidence of vomiting was 71.4%. Naruka BS, Manchanda and Arora, Karmarkar, Khanduja, quoted figures of 62.5%, 57.5%, 95.4% and 90% respectively. Fever was noted in 68 cases (54.4%) of the cases. Naruka B S and Manchanda and Arora reported fever in 55.5% and 53.8% respectively which was similar to

our study. Chaomin Wan quoted fever in 75.4% and Shrivatsava J R in 48.2% which differed from our study.

Conclusions

After studying 125 cases of acute diarrhoea we came to the conclusions regarding the clinical features and bacteriological profile. The incidence of acute gastroenteritis in children above 1 month and below 5 years in our study was 12.24% of all pediatric medical admissions. The incidence was more during the second half of the infancy (45%). There was no sex predilection in our study. The occurrence was more in children who have been weaned (70%) than those who were exclusively breast fed. The incidence was more (68%) in children living in poor sanitary conditions. More than half of patients (59%) belonged to class III and IV of modified B.J. Prasad classification. The average frequency loose stools was 10.1 times/day. The stools were yellowish (70%), greenish (11%), white/colourless (15%), greenish yellow (5%) with watery consistency in 84% or semisolid in 16% of cases. Mucus and or blood in stool were seen in 33% of cases. Vomiting was frequent accompaniment (76%) was unrelated to severity of disease. Fever was seen in 45% of cases.

RECOMMENDATION

Improve the laboratory to isolate all types of bacteria especially those which are not routinely isolated. Establish a reference laboratory to identify the serotypes of salmonella, shigella and other enteropathogenies which help in understanding the exact epidemiological factor so that proper steps can be taken to control them. Effective strategies to provide safe drinking water to all families in the community. Molecular analysis of stool sample which are negative for bacterial growth to find the causative organism as it could be due to rotavirus infection. Rotavirus vaccine can be initiated for possible incorporation in national immunization schedule. Discourage antibiotic usage in early stages of acute watery diarrhoea to present the development of resistance.

Conflict of Interest: None.

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