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CLINICAL PROFILE OF ACUTE GASTROENTERITIS IN CHILDREN AT A TERTIARY CENTRE

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ABSTRACT

Introduction: *Acute gastroenteritis accounts for millions of deaths each year in young children, mostly in developing communities. diarrhoea, vomiting and fever are the most common presenting symptoms. The aim of the study was to describe the clinical profile of Acute Gastroenteritis in children at National Medical College and Teaching Hospital, Birgunj.*

Materials and Methods: *This descriptive cross-sectional study was carried out in pediatric ward and Intensive Care Unit at National Medical College and Teaching Hospital, Birgunj, Nepal for 6 months (November 2021 to April 2021). Ethical clearance and informed written consent were taken for the study.*

Results: *Among 138 cases enrolled in the study, most common symptoms were diarrhoea, vomiting and fever. Signs of some dehydration was seen in 39.1% of the cases whereas 4.4% cases had signs of severe dehydration. Oral rehydration Solution (ORS) was mainstay of treatment along with zinc and probiotics. Antibiotics was used in 52.2% cases. Among all the cases, 75.4% cases and their caretakers did not routinely wash their hands.*

Conclusion: *Diarrhoea, vomiting and fever are the most common symptoms in acute gastroenteritis. Use of ORS and zinc is recommended for the management in acute gastroenteritis in children. Antibiotic therapy should be used judiciously in the management of acute gastroenteritis. Increase awareness among the public about proper hand washing and hygiene can significantly reduce the incidence of diarrhoea and other infectious diseases in children.*

Keywords: *Acute Gastroenteritis, Dehydration, Electrolyte Imbalance, Malnutrition, Metabolic Acidosis, Oral Rehydration Solution*

INTRODUCTION

Acute gastroenteritis is defined as an inflammation of the gastrointestinal tract, characterized by the sudden onset of vomiting, diarrhea, and abdominal pain. The condition can be caused by various pathogens, including viruses, bacteria, and parasites, and is usually self-limited.[1]

Diarrhea is defined as the passage of three or more loose or liquid stools per day (or more frequently than is normal for the individual), usually accompanied by cramping, abdominal pain, and/or urgency to defecate. The stools may also contain blood, mucus, or pus, depending on the underlying cause of the diarrhea.[2]

Acute gastroenteritis accounts for millions of deaths each year in young children, mostly in developing communities.[3] By the age of three years, virtually all children become infected with the most common agents. Diarrhoea, vomiting and fever are the most common presenting symptoms. Etiology includes a variety of viral, bacterial, and parasitic enteropathogens, improperly prepared food or the reheating of meat dishes, seafood, dairy and bakery products, poisoning with heavy metals.[4]

Dehydration, which may be associated with electrolyte imbalance and metabolic acidosis, is the most frequent and dangerous complication. Optimal management with oral or intravenous fluids minimises the risk of dehydration and its adverse outcomes. Routine use of antibiotics, antidiarrhoeal agents, and antiemetics is not recommended and may cause harm. Prevention is the key to controlling gastroenteritis, and highly effective rotavirus vaccine plays a major role in prevention of diarrhoea in children. Prevention includes careful hand washing, nappy disposal, and preparation and storage

of food and drinking water, particularly in institutions, including hospitals where nosocomial infection is common.[3, 5]

Deaths are usually as a result of dehydration, but malnutrition also plays an important role. Furthermore, malnutrition increases the incidence and severity of diarrhoea, as well as other infections.[6]Worldwide, diarrhea related mortality hasdecreased, mainly because of bettertherapeutic interventions along with provisionof safe drinking water, improvement ofsanitation and popularization of primaryhealth care activities.[7]

In the present context, the prevalence of acute gastroenteritis is still high among children and AGE complicated with severe dehydration, malnutrition or electrolyte imbalance have relatively poor prognosis.
To describe the clinical characteristics (presenting complaints, examination findings and lab findings) of AGE at admission.

To find the association between Hand washing and different clinical pattern in AGE

MATERIALS AND METHODS

This is a cross-sectional descriptive study carried out in Pediatric ward and Intensive Care Unit at National Medical College and Teaching Hospital, Birgunj, Nepal, The study duration was 6 Months (November 2021 to April 2021)

Target Population: All the children age upto 5 years presenting to Pediatrics department with diagnosis fitting to acute gastroenteritis.

Study Variables

Sociodemographic variables- Age, Sex, Weight, Height, MUAC, Socioeconomic status

Illness Variables-Type of diarrhoea (watery/ bloody/ mucus/ yellowish/foul smelling), Type of dehydration (No/Some/Severe), use of ORS, Zinc, Antibiotics, Probiotics, Hand Wash

The Inclusion Criteria were the subjects with age ≤ 5 years and the clinical diagnosis of Acute Gastroenteritis. The exclusion criteria were preterm neonates, gross congenital abnormalities, chronic illness and consent not given

After obtaining Ethical Committee clearance from the institution a proforma was prepared for the study. Proforma included information for patient's details, demographic profile, anthropometric evaluation, and clinical signs. Informed written consent from the caregivers of children was taken.

Table 1: Assessment of diarrhoea patients for dehydration[2]

	A	B	C
LOOK AT: i. CONDITION ii. EYES iii. THIRST	i. Well, alert ii. Normal iii. Drinks normally, not thirsty	i. Restless, irritable ii. Sunken iii. Thirsty, drinks eagerly	i. Lethargic or unconscious ii. Sunken iii. Drinks poorly, or not able to drink
FEEL: SKIN PINCH	Goes back quickly	Goes back slowly	Goes back very slowly
DECIDE	The patient has NO SIGNS OF DEHYDRATION	If the patient has two or more signs in B, there is SOME DEHYDRATION	If the patients has two or more signs in C, there is SEVERE DEHYDRATION

Clinical examinations included a thorough physical examination, including vital signs, hydration status, and assessment of mucous membranes, skin turgor and any sign of infectionA blood sample and stool sample was sent for further laboratory investigations. Laboratory investigations included complete blood count, electrolyte levels, kidney function tests, stool routine microscopic examinations and stool culture.

Statistical Package for Social Sciences (SPSS version 20.0) was used for the statistical analysis.

RESULTS

A total 138 patients of acute gastroenteritis aged below 5 years attending Department of Pediatrics were include in this study.

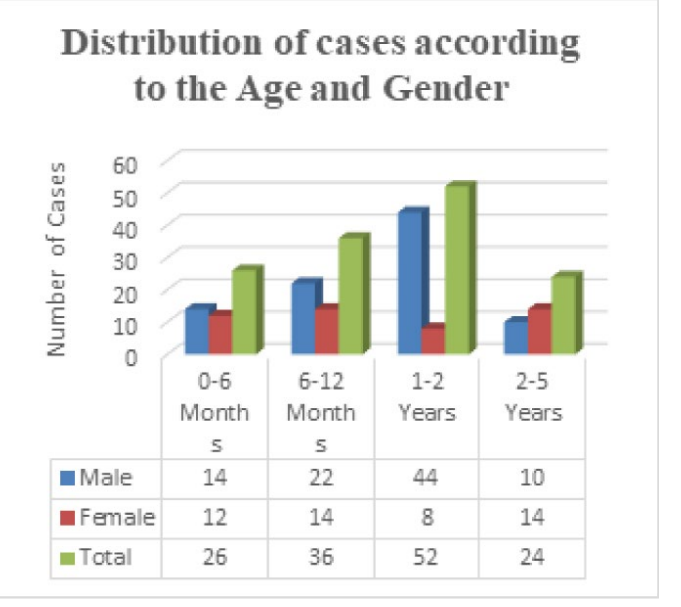

Figure 1: Distribution of Age and Sex of Children

Out of 138 children, 90 (65.22%) were male and 48 (34.78%) were female.

There were a total of 26(18.8%) patients in the 0-6 months age group out of which 12 female and 14 male,

36 (26.1%) patients in the 6-12 months age group out of which 14 female and 22 male, 52 (37.7%) patients in the 1-2 years age group out of which 8 female and 44 male. Similarly, total of 24 (17.4%) patients in the 2-5 years age group out of which 14 were female and 24 were male.

Table 2: Distribution of cases according to weight

Weight	Number	Percent
3-5 kg	2	1.4
6-9 kg	82	59.5
10-12 kg	46	33.3
13-15 kg	8	5.8
Total	138	100.0

Most of the children included in the study were 6-9 kg-82 (59.5%), followed by 46 (33.3%) children between 10-12 kg, 8 (5.8%) children between 13-15 kg and remaining 2 (1.4%) children between 3-5 kg.

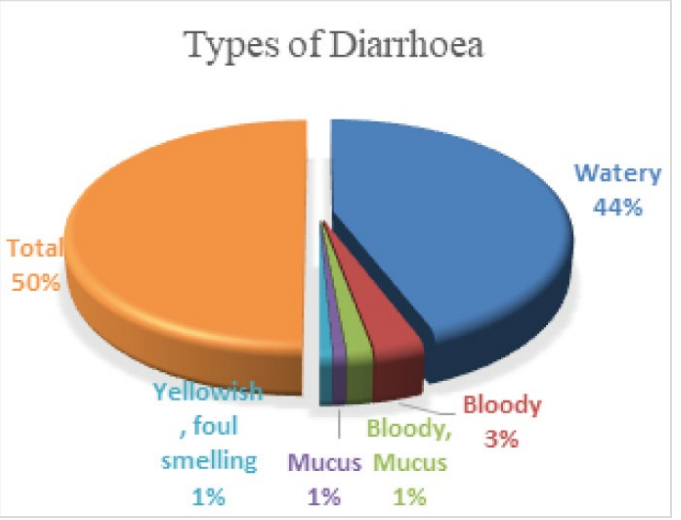

Figure 2: Types of Diarrhoea

The most common type of diarrhoea is watery in 122 (88.5%) patients, bloody in 8 (5.8%) patients, bloody with mucus in 4 (2.9%) patients, mucus in 2 (1.4%) patients and yellowish foul smelling in 2 (1.4%) patients.

Table 3: Diagnosis

Statement	Number	Percent
AGE with no dehydration	66	47.9
AGE with some dehydration	56	40.7
Age with severe dehydration	6	4.3
Dysentery	6	4.3
Amoebic dysentery	2	1.4
AGE with ARI*	2	1.4
Total	138	100.0

*Acute Respiratory Infection

The most common diagnosis was AGE with no dehydration in 66 (47.9%) patients, followed by AGE with some dehydration in 56 (40.7%) patients. Similarly, AGE in severe dehydration, Dysentry, Amoebic dysentry, AGE with ARI was diagnosd in 6 (4.3%), 6 (4.3%), 2 (1.4%) and 2 (1.4%) patients respectively.

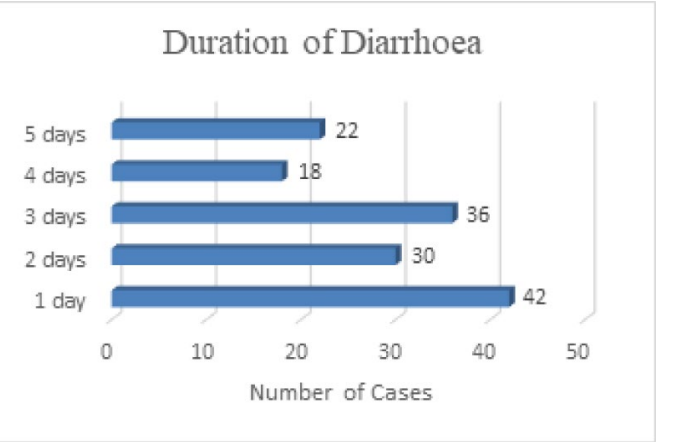

Figure 3: Duration of Diarrhoea

Among the total cases, 42 (30.4%) had diarrhoea for 1 day, 30 (21.6%) for 2 days, 36 (26.1%) for 3 days, 18 (13.0%) for 4 days and remaining 22 (15.9 %) had diarrhoea for 5 days.

Table 4: Symptoms associated with Diarrhoea in different age group

Sign/symptoms	Age				
	0-6 months	6-12 months	1-2 years	2-5 years	Total
Fever	2	4	4	4	14
Vomiting	12	16	24	8	60
Fever and vomiting	10	14	22	4	50
Fever, Vomiting, Abdominal pain	2	2	2	2	8
Abdominal pain	-	-	-	4	4
Vomiting, abdominal pain	-	-	-	2	2
Total	26	36	52	24	138

Among all the cases with diarrhoea, most common associated symptom with diarrhoea was vomiting in 60 (43.48%) cases, followed by fever with vomiting in 50 (36.2%) cases, fever in 14 (10.1%) cases, fever with vomiting with abdominal pain in 8 (5.8%) cases, abdominal pain in 4 (2.9%) cases and vomiting with abdominal pain in 2 (1.5%) cases.

Vomiting and fever with vomiting was most common in age group 1-2 years with 24 and 22 cases respectively followed by 6-12 months age group with 16 and 14 cases respectively. As shown in the table above, there were 4 cases in age groups 6-12 months, 1-2 years, 2-5 years and remaining 2 cases of fever was in age group 0-6 months. Abdominal pain and vomiting with abdominal pain was only seen in 2-5 years age group with 4 and 2 cases

respectively. There were 2 cases in each age group (i.e. 0-6 months, 6 months- 1 year, 1-2 years, and 2-5 years) with all three symptoms- fever, vomiting and abdominal pain.

Table 5: Age by Dehydration

Dehydration	Age				
	0-6 month	6-12 month	1-2 year	2-5 year	Total
Severe	-	2	4	-	6
Some	6	18	24	6	54
No	20	16	24	18	78
Total	26	36	52	24	138

Among all the 138 cases included in the study, 78 (56.5%) cases had no signs of dehydration, 54 (39.1%) of the cases had some dehydration and 6 (4.4%) cases had signs of severe dehydration.

Among 78 cases with no dehydration, 24 cases was in age group 1-2 years, 20 in 0-6 months age group, 18 in 2-5 years age group and 16 in 6 months to 12 months age group. Similarly, among 54 cases with some dehydration, 24 cases were in age group 1-2 years, 18 cases in 6-12 months age group, and 6 cases in age groups 0-6 months and 2-5 years each. Age goup 1-2 years had 4 cases of severe dehydration and age group 6-12 months had 2 cases of severe dehydration.

Table 6: Stool R/E

Statement	Number	Percent
Normal	98	71.1
Cyst, pus cells	2	1.4
RBCs, Pus cells	2	1.4
Mucus, RBC	2	1.4
Pus cells	10	7.3
Cyst of E. histolytica	4	2.9
Reducing sugar	2	1.4
Mucus present	2	1.4
RBC, mucus, cyst of Ent-amoeba hystolytica	4	2.9
Few fat droplets	8	5.9
Undigested food particles	4	2.9
Total	138	100.0

Stool sample were collected from all the cases for stool routine microscopic examination. Normal stool R/E was seen in 98 (71.1%) cases, 10 cases showed pus cells and 8 had few fat droplets. Cyst of E. histolytica, undigested food particles, RBCs with mucus with cyst of E. histolytica was seen in 2 cases each. Similarly, Cyst and pus cells, RBCs and pus cells, mucus and RBCs, reducing sugar, mucus were seen in 2 cases each.

Depending upon clinical condition of patients, different treatment options were used in combination for management of the cases. Oral rehydration Solution (ORS) was used in 78 (56.5%) cases, Probiotics in 50 (36.2%) cases, zinc in 56 (40.6%) cases and antibiotics wasrequired for 72 (52.2%) cases.

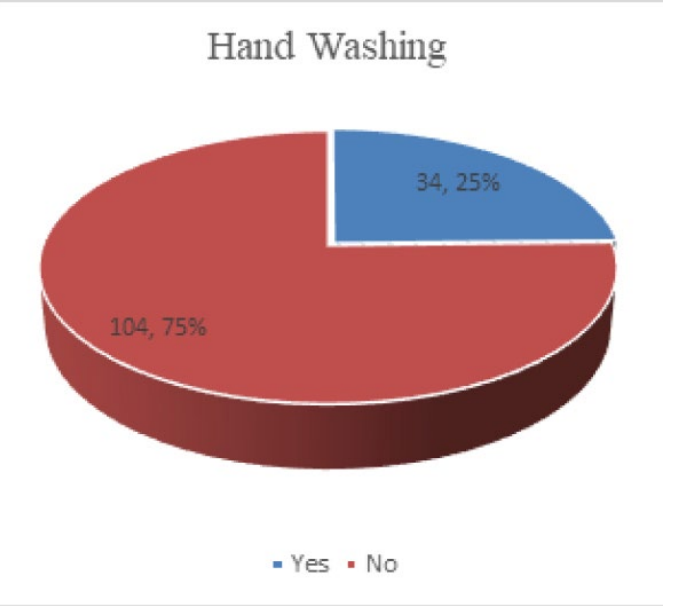

Figure 4: Hand Washing

Among all the cases, 104 (75.4%) cases and their caretakers did not routinely wash their hands.

Among all the admitted cases, 56 (40.6%) cases had improved symptoms on day 3rd day, 48 (34.8%) improved on 2nd day, 18 (13.0%) improved on 1st day and 8 cases each improved on 4th and 5th day.

Among all the 138 admitted cases, 6 (4.3%) cases required hospital stay for only one day. Similar, 28 (20.4%), 18 (13.1%), 32 (23.2%), 42 (30.4%), 4 (2.9%), 6 (4.3%) and 2 (1.4%) required hospital stay for 2, 3, 4, 5, 6, 7 and 8 days respectively.

DISCUSSION

Acute gastroenteritis is a common illness in children worldwide, particularly in developing countries, and it is a leading cause of morbidity and mortality in children under five years old.[8] The results of this study provide valuable insights into the clinical profile of acute gastroenteritis in children in Nepal. Male predominance was seen in cases acute gastroenteritis in children which is consistent with the findings in the study done by Huilan et al [9].The study found that diarrhea and vomiting were the most common presenting symptoms, consistent with previous studies. [10, 11] The high incidence of fever is also notable, as it can indicate a more severe illness and may require more aggressive treatment.

Dehydration is a significant complication of acute gastroenteritis and is associated with an increased risk of morbidity and mortality.[11] In our study, 43.5% of the

children with acute gastroenteritis had dehydration, and 4.4% had severe dehydration. The severity of dehydration was significantly associated with younger age. These findings are consistent with previous studies which highlight the importance of early recognition and management of dehydration in children with acute gastroenteritis. [12, 13]

Oral rehydration therapy (ORT) is the mainstay of management for children with acute gastroenteritis and has been shown to significantly reduce morbidity and mortality. [2]In our study, ORT was used to manage the majority of children with acute gastroenteritis. Antibiotic therapy was prescribed to a large proportion of children (52.2%) with acute gastroenteritis, without positive bacterial cultures. This is concerning, as overuse of antibiotics can contribute to the development of antibiotic resistance and can also increase the risk of adverse effects. According to the guidelines for the management of AGE, antibiotic therapy should not be given to the vast majority of children with AGE, unless specific conditions are present. Even in cases of proven bacterial gastroenteritis, antibiotic therapy is not routinely needed but should be considered only for specific pathogens or in defined clinical settings.The routine use of antimicrobials for diarrhea in children is not recommended by the World Health Organization (WHO) except for clinically recognizable severe cases.[14] Therefore, there is a need for increased awareness among healthcare professionals and the public about the appropriate use of antibiotics in the management of acute gastroenteritis. The inappropriate use of antibiotics can lead to the emergence of antibiotic-resistant bacteria, which is a global public health threat. [15]

In addition to medical management, preventive measures such as hand washing can also reduce the burden of acute gastroenteritis. Hand washing is a simple, low-cost intervention that can significantly reduce the incidence of diarrhea and other infectious diseases. [13, 14, 16, 17]However, hand washing practices are suboptimal in many developing countries, including Nepal, due to lack of access to clean water and soap and lack of awareness about the importance of hand washing. [18]Therefore, targeted interventions aimed at promoting hand washing practices in these settings can significantly reduce the burden of acute gastroenteritis and other infectious diseases in children.

Limitations of the study include study of pathogens associated with acute gastroenteritis. In addition, the study was conducted in a single center, which may limit the generalizability of the results.

CONCLUSION

This study provides valuable insights into the clinical profile of acute gastroenteritis in children in Nepal. The results suggest that diarrhoea, vomiting and fever are the most common symptoms in acute gastroenteritis. Early recognition and prompt management of dehydration is required for better prognosis of AGE in children. Use of ORS and zinc is recommended for the management in acute gastroenteritis in children. Antibiotic therapy should be used judiciously in the management of acute gastroenteritis. In addition, efforts should be made to increase awareness among the public about proper hand washing and hygiene which can significantly reduce the incidence of diarrhea and other infectious diseases in children, particularly in resource-limited settings.

REFERENCES

1. Guarino A, Ashkenazi S, Gendrel D, et al. European Society for Paediatric Gastroenterology, Hepatology, and Nutrition/European Society for Paediatric Infectious Diseases evidence-based guidelines for the management of acute gastroenteritis in children in Europe: update 2014. J Pediatr Gastroenterol Nutr. 2014;59(1):132-152.

2. World Health Organization. The Treatment of Diarrhoea: A manual for physicians and other senior health workers. 4th ed. Geneva: World Health Organization; 2005.

3. Elliott EJ. Acute gastroenteritis in children. Bmj. 2007 Jan 4;334(7583):35-40.

4. Webb A, Starr M. Acute gastroenteritis in children. Aust Fam Physician. 2005;34(4):227-231.

5. Ghssein G, Salami A, Salloum L, Chedid P, Joumaa WH, Fakih H. Surveillance study of acute gastroenteritis etiologies in hospitalized children in south Lebanon (SAGE study). Pediatric Gastroenterology, Hepatology & Nutrition. 2018 Jul 1;21(3):176-83.

6. Revelas A. Acute gastroenteritis among children in the developing world. Southern African Journal of Epidemiology and Infection. 2012 Jan 1;27(4):156-62.

7. Ahmed S, Kabir L, Rahman A, Hussain M, KHATOUN S, Hannan A. Severity of rotavirus diarrhea in children: one year experience in a children hospital of Bangladesh.Iran J Pediatr Jun 2009; Vol 19 (No 2), Pp:108-116.

8. Troeger C, Blacker BF, Khalil IA, et al. Estimates of the global, regional, and national morbidity, mortality, and aetiologies of diarrhoea in 195 countries: a systematic analysis for the Global Burden of Disease

Study 2016. Lancet Infect Dis. 2018;18(11):1211-28.

9. Huilan S, Zhen LG, Mathan MM, Mathew MM, Olarte J, Espejo R, et al. Etiology of acute diarrhoea among children in developing countries: A multicentre study in five countries. Bull World Health Organ. 1991;69:549–55.

10. Ezeonwu B, Ibeneme C, Aneke F, Oguonu T. Clinical features of acute gastroenteritis in children at university of Nigeria teaching hospital, ituku-ozalla, enugu. Ann Med Health Sci Res. 2013 Jul;3(3):361-4.

11. Walker-Smith J. Gastroenteritis. Diseases of the Small Intestine in Childhood. 1988:185–284.

12. Pieścik-Lech M, Shamir R, Guarino A, Szajewska H. The management of acute gastroenteritis in children. Alimentary pharmacology & therapeutics. 2013 Feb;37(3):289-303.

13. Hartman S, Brown E, Loomis E, Russell HA. Gastroenteritis in children. American family physician. 2019 Feb 1;99(3):159-65.

14. Azor-Martínez E, Cobos-Carrascosa E, Gimenez-Sanchez F, Martínez-López JM, Garrido-Fernández P, Santisteban-Martínez J, Seijas-Vazquez ML, Campos-Fernandez MA, Bonillo-Perales A. Effectiveness of a multifactorial handwashing program to reduce school absenteeism due to acute gastroenteritis. The Pediatric Infectious Disease Journal. 2014 Feb 1;33(2):e34.

15. Bruzzese E, Giannattasio A, Guarino A. Antibiotic treatment of acute gastroenteritis in children. F1000Res. 2018 Feb 15;7:193.

16. Ejemot RI, Ehiri JE, Meremikwu MM, Critchley JA. Hand washing for preventing diarrhoea. Cochrane Database Syst Rev. 2008;(1):CD004265.

17. Mekonen T, Admasie A, Leka YL, Darota D, Feleke FW. Handwashing Practice and Its Predictors Among Mothers of Children Aged 0 to 23 Months in South Ethiopia: Community Based Cross-Sectional Study. Environ Health Insights. 2021 Nov 23;15.

18. World Health Organization. WHO recommendations on home-based records for maternal, newborn and child health. Geneva: WHO; 2018