PRESCRIBING PATTERN IN ACUTE GASTROENTERITIS AMONG PEDIATRIC INPATIENTS IN A TEACHING HOSPITAL

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Summary

Introduction: Acute gastroenteritis is a very common problem in infants and children and is usually caused by rotavirus, bacteria, food poisoning. Viruses account for approximately 70% of episodes of acute infectious diarrhea. Acute diarrhea being responsible for up to 2.5 million deaths worldwide in young children each year.

Objectives:

- To study the prescribing patterns in AGE.
- To calculate the number of drugs prescribed per admission and drugs prescribed from the essential drug lists.
- To calculate average cost of drugs per hospital admission.

Methodology: A retrospective study was carried out and 132 pediatric case records of patients with AGE over two months were collected after obtaining permission from the institutional ethical committee. The data was analyzed for number of drugs prescribed, percentage of admissions that were prescribed antibiotics, most commonly prescribed drug classes and individual drugs were noted. The average cost per admission also noted.

Results: Of 132 case records studied 82 were males. The average duration of hospitalization was around 3 days. Average number of drugs per prescription was 4.5. Average number of drugs in national essential drug list was 3.79. Among 486 drugs and 106 I.V. fluids prescribed 116 were antibiotics (23.86%). Most common antibiotics were aminoglycosides (50%), cephalosporins (38.8%) and others (11.20%). Other drugs include zinc suspensions (23.3%), antiemetics (19.5%), probiotics (10.60%), paracetamol (7.2%). Others (15.6%) include antidiarrheals, antacids, vitamin supplements, cough syrups, folic acid etc., Percentage of drugs prescribed by generic name was 7.9%, and percentage of encounters with an injection is 55.70%. The average cost per admission was Rs. 166.53.

Conclusion: Commonly used antibiotics in our set up were cephalosporins, aminoglycosides. Use of I.V fluids was limited to some and severe dehydration. Antiemetic frequently used was ondansetron. Zinc preparation was added to curtail the severity of the episode and prevent further occurances for two to three months and decrease the morbidity considerably.

Key words: Prescribing pattern, Acute gastroenteritis, Oral rehydration therapy salt, Intra venous fluids, Antibiotics.

Introduction

Acute gastroenteritis (AGE) continues to be a leading cause of mortality and morbidity in the paediatric population globally, and is responsible for death of 2.5 million under-five children every year [1].

The American Academy of Pediatrics (AAP) defines AGE as "diarrheal disease of rapid onset, with or without accompanying symptoms or signs such as nausea, vomiting, fever or abdominal pain."[2]

The World Health Organization (WHO) defines diarrhoea as the passage of unusually loose or watery stools, usually at least three times in a 24 h period.[3] In India, diarrhoeal diseases are the second leading cause of child mortality (20%) [4].

Diarrheal diseases account for about 8.2% of the total burden of disease in India, contributing about 22 million of Disability Adjusted Life Years (DALYs) lost, the highest among communicable diseases [5]

Worldwide, infectious agents (viruses, bacteria and parasites) are by far the most common causes of AGE.[6,7] Viruses, primarily rotavirus species, are responsible for 70 to 80 percent of infectious diarrhea cases in the developed world, various bacterial pathogens account for another 10 to 20 percent of cases and parasitic organisms such as Entamoeba, Giardia species cause fewer than 10 percent of cases.[8]

The management of AGE is directed at preventing or treating the dehydration that so often accompanies this disease [2]

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Methodology

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Results

Of 132 case records studied 82 were males. The average duration of hospitalization was around 3 days. Average number of drugs prescription was 4.5. Average number of drugs in national essential drug list was 3.79. Among 486 drugs and 106 I.V. fluids prescribed 116 were antibiotics (23.86%), zinc suspensions (23.3%), antiemetics (19.5%), probiotics (10.60%), paracetamol (7.2%). Others (15.6%) include antidiarrheals, antacids, vitamin supplements, cough syrups, folic acid etc., (Table: 1)

Among 116 antibiotics, most common were aminoglycosides (50%), cephalosporins (38.8%) and others (11.20%). (Table: 2)

Of 132 cases admitted, 7 had severe dehydration, among them 3 received only intravenous fluids (IVF) and 4 received both IVF and oral rehydration salt solution (ORS): 111 had some dehydration, among them 54 received both IVF and ORS, 39 received only IVF, 10 received only ORS and 8 did not receive either IVF or ORS: 14 had no dehydration, among them 4 received both IVF and ORS, 3 received only IVF, 4 received only ORS but 3 did not receive either IVF or ORS. (Table: 3)

According to WHO prescribing indicators, average number of drugs per encounter was 4.5, percentage of drugs prescribed by generic name was 7.9%, and percentage of encounter with an antibiotic prescribed was 25.13%, percentage of encounters with an injection is 55.70%. Percentage of drugs prescribed from national essential drugs list was 37.9%. The average cost per admission was Rs. 166.53. (Table: 4)

Table 1: The drugs used:

Drugs	Antibiotics	Zinc suspensions	Anti-emetics	Probiotics	Paracetamol	Others
Percentage	23.86%	23.30%	19.50%	10.60%	7.20%	15.60%

Table 2: Antimicrobial agents used:

Drugs	Cephalosporins	Aminoglycosides	Others
Percentage	45 (38.80%)	58 (50%)	13 (11.20%)

Table 3: Dehydration status and use of IVF, ORS:

	Number of patients	IVF	ORS	IVF+ORS	No IVF+ORS
No dehydration	14	03	04	04	03
Some dehydration	111	39	10	54	08
Severe dehydration	07	03	-	04	-

Table 4: WHO prescribing indicators:

Prescription indicators	Findings
1. Average number of drugs per encounter	4.5
2. Percentage of drugs prescribed by generic name	7.9%
3. Percentage of encounters with an antibiotic prescribed	25.13%
4. Percentage of encounters with an injection prescribed	55.70%
5. Percentage of drugs prescribed from national essential drugs list	37.9%
6. The average cost per admission	Rs. 166.53

Discussion

AGE is a diarrheal disease of rapid onset, with or without accompanying symptoms or signs such as nausea, vomiting, fever or abdominal pain. [2] The most common infectious agents connected with diarrhea in children, in developing countries like India are viruses, bacterias, protozoans and food poisoning[9]

The management of diarrhea following AGE depends on the causative agent. Viral GE is usually self limiting and fluid replacement is must, antibiotics have no role, antidiarrheals, antiemetics, zinc preparations are also useful. [10]

Bacterial GE is managed with fluid replacement, ciprofloxacin, cefixime, ceftriaxone, cefotaxime, co-trimoxazole, rifamixin, vancomycin, antidiarrheals, antiemetics, zinc preparations are also useful. [11]

The main stay of medical treatment of GE due to food poisoning is fluid and electrolyte replacement. Antibiotics rarely used depending on organism because of the development of resistance, and antidiarrheals, antiemetics also used.[12]

Antidiarrheal, racecadotril is most commonly used. It is an enkephalinase inhibitor which inceases the local concentration of enkephalins and stimulates the mu and delta opioid receptors to produce anti-diarrheal effect. [13]

Probiotics offers therapeutic benefit in the treatment of AGE in children. They can protect the intestine by competing with pathogens for attachment, strengthening tight junctions between enterocytes and enhancing the mucosal immune response to pathogens. [14]

Zinc preparation have also shown that they help in reducing the risk, severity and duration of diarrheal diseases by inhibiting c-AMP induced, chloride-dependent fluid secretion by inhibiting basolateral K^+ channels. Also improves absorption of water & electrolytes, regeneration of intestinal epithelium, increases the levels of brush border enzymes, enhances immune response and inhibits toxin induced cholera. [15]

Antiemetics like ondansetron was effective in lowering the rates of intravenous fluid administration and hospital admission in patients with vomiting from AGE. [16]

In our study, among 486 drugs and 106 IVF prescribed 116 were antibiotics, zinc suspensions, antiemetics, probiotics, paracetamol. Others include antidiarrheals, antacids, vitamin supplements, cough syrups, folic acid etc.,

Among 116 antibiotics, cephalosporins and aminoglycosides were routinely used. Among cephalosporins cefotaxime & ceftriaxone and among aminoglycosides amikacin were commonly used.

Moreover, it is not surprising that the use of fluoroquinolones has become a common place amongst gastroenteritis patients, as it has been shown to reduce the duration of diarrhoea in patients with both culture-positive and culture-negative gastroenteritis.[17] But in our study, fluoroquinolones were not commonly prescribed.

Ringer lactate was commonly used to encounter electrolyte losses immediately and ORS as replacement to IV Fs.

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Conclusion

Commonly used antibiotics in our set up were cephalosporins, aminoglycosides. Use of I.V fluids was limited to some and severe dehydration. Antiemetic frequently used was ondansetron. Zinc preparation was added to curtail the severity of the episode and prevent further occurrences for two to three months and decrease the morbidity considerably.

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