



Acute Gastroenteritis in Children: Case Report

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ABSTRACT

Acute gastroenteritis (GAE) is a major cause of morbidity and mortality in children in developing countries, especially in children under five years of age. This condition is characterized by acute diarrhea that can lead to severe dehydration and death if not treated appropriately. Effective management of GEA requires appropriate rehydration therapy, adequate nutrition, and rational use of antibiotics. This is an observational study with a case report approach conducted on a 2.5-year-old child patient hospitalized with a diagnosis of acute gastroenteritis. Data were collected qualitatively through clinical observations, therapy records, and laboratory test results. The patient experienced diarrhea up to six times per day, accompanied by vomiting and shortness of breath on the first day of treatment. Therapy included rehydration with KAEN 3B, antiemetics (ondansetron, domperidone), antibiotics (trimethoprim-sulfamethoxazole), and supplements. Symptom improvement began to appear on the second to third day of treatment, with decreased diarrhea frequency and stable vital parameters. Laboratory results showed the presence of bacteria without signs of parasitic infection. Management of acute gastroenteritis in children requires comprehensive management, starting with appropriate rehydration, symptom control, and rational antibiotic administration based on the etiology. Antiemetics such as ondansetron have been shown to be effective in supporting the success of oral rehydration therapy. Education regarding prevention and prudent antibiotic use is crucial to reduce resistance rates and mortality from acute gastroenteritis.

Keywords: acute gastroenteritis, antibiotics, children, diarrhea, ondansetron, rehydration

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BACKGROUND

Acute gastroenteritis (GAE), or diarrhea, is a leading cause of morbidity and mortality in children in developing countries. GAE is a symptom that can occur due to abnormalities in digestive, absorption, and secretion functions. The onset of AE occurs suddenly and lasts less than 14 days and can cause excessive fluid and electrolyte loss. According to the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) in 2017, more than 1.87 million people die from gastroenteritis each year worldwide. According to the WHO, children under 5 years of age account for 16% of deaths. Approximately 1.7 billion cases of diarrhea occur annually, resulting in approximately 760,000 child deaths (Astin H. Makuta, Rosita, Indri Iriani, 2024). Meanwhile, according to the 2018 Basic Health Research (Riskesdas), the highest prevalence of diarrhea occurs in children aged 1-4 years, accounting for 11.5% of cases diagnosed by health workers, and it remains the leading cause of death in children under 5 years. The weak immune system in children and toddlers is one of the reasons gastroenteritis frequently affects this group. Gastroenteritis is often accompanied by dehydration, ranging from moderate to severe. This is a consequence of gastroenteritis, namely



disruption of fluid and electrolyte volume, leading to dehydration. Dehydration in children can be serious and can lead to death if not treated properly. Dehydration worsens when combined with other symptoms such as diarrhea and fever due to the loss of body fluids through evaporation. Fluids and electrolytes are basic human needs that must be met. In children, gastroenteritis can have several impacts. These impacts include decreased appetite, weakness, nausea and vomiting, and damage to skin integrity due to active fluid loss. The most common consequence is death. Seeing the magnitude of the effects that occur, early handling and appropriate treatment are needed to minimize nutritional deficiencies and improve the patient's nutritional needs. Early treatment can improve the patient's functional health status and accelerate recovery. Therefore, appropriate nutritional therapy for patients with acute gastroenteritis is crucial to reduce the risk of death. Several studies have found that zinc and selenium supplementation can shorten the recovery time or length of stay for patients with acute gastroenteritis. Treatment of acute diarrhea due to infection is carried out as a causal therapy based on the causative pathogen. Antibiotics are the most commonly prescribed drugs for bacterial infections and are intended for treatment or prevention. As technology advances, the number and types of antibiotics are increasing, necessitating accurate antibiotic use. Appropriate antibiotic use will provide good effectiveness, but irrational antibiotic use can lead to resistance problems, which reduce the antibiotic's ability to treat the infection, making it difficult for the patient's diarrhea to improve (Gau et al., 2024).

METHODS

This research method was conducted observationally using a case report approach on a finding in one of the hospitals by looking qualitatively and in detail by describing the patient's case clinically from the therapy used, treatment follow-up and laboratory identification.

RESULTS

Case Presentation

Patient Identity

Table 1. Patient Identity

Name	An. DR
Age	2,5 yo
Weight	13 kg
History of illness	There isn't any
Treatment history	There isn't any
Diagnosis	Gastroenteritis acute
Reason for admission to hospital	

Clinical data

Table 2. Clinical Data

Parameters	27/7	28/7	29/7	30/7
Heart Rate (HR) x/min	120	120	100	100
Retention Rate (RR) x/min	28	27	27	26
Temperature (°C)	37,5	37	36,7	36,7
Diarrhea	6x	4x	3x	-
Nausea	2x	2x	-	-
Vomiting	yes	no	no	no
Out of breath	yes	no	no	no



Laboratory Data

Table 3. Laboratory data feces

Data lab	Normal Value	28/7
Colour feces	Yellow	Yellow
Consistency	Mushy	Mushy
T.amilum	Negative	Negative
T.amoeba (kista)	Negative	Negative
T amoeba (tropozoid)	Negative	Negative
T bakteri	Positive	Positive
T epitel	Negative	Negative
T eritrocites	Negative	Negative
T Fungi	Negative	Negative
T leucocyte	Negative	Negative
T Cerkonulin	Negative	Negative
T Fat	Negative	Negative

Table 4. Laboratory data urine

Data lab	Normal Value	28/7
Colour feces	Yellow	Yellow
LPH	7,0	7,0
Reduction	Negative	Negative
Protein	Negative	Negative
BJ	1,015	1,010-1,030
Krobilinogen	Positive	Positive

Therapeutical Data

Table 5. Therapeutical Data

Therapy	27/7	28/7	29/7	30/7
KAEN 3B	√	√	√	√
Trovensis	√	-	-	-
Trimoxul Syrup	-	√	√	√
Suques	-	√	√	√
Vometa Syrup	-	√	√	√

DISCUSSION

Acute gastroenteritis (AE) is generally defined as decreased stool consistency (liquid or watery) and/or increased stool frequency (usually 3 in 24 hours), with or without fever or vomiting. Diarrhea usually lasts less than 7 days and no more than 14 days. The best indicator of diarrhea, especially in the first year of life, is stool consistency, not stool frequency. The incidence of diarrhea ranges from 0.5 to 2 episodes per child per year in children under 3 years of age in Europe. The etiologic agents of AE vary and depend on the child's immune competence. Causes of AE can be viruses, bacteria, and parasites. The most common viral cause of AE in immunocompetent children is rotavirus. The incidence of rotavirus AE is low in countries where oral rotavirus vaccination, Rotarix, and RotaTec, is available. The most common bacterial causative agents in immunocompetent children are Salmonella or Campylobacter, depending on the environment. Meanwhile, the most common viral agents in immunocompromised children are Adenovirus, Rotavirus, Norovirus, Astrovirus, and



Sapovirus (Sonja Bojadzieva, Aspazija Sofijanova, 2021). Based on observations of gastroenteritis in a 13 kg child, fluid requirements can be calculated. In this case, the patient received KAEN 3B therapy, with a composition per liter containing 50 mEq of Na, 20 mEq of K, 50 mEq of Cl, 20 mEq of lactate, and 27 grams of glucose. The calculation of fluid requirements for this patient is based on: (Koda-Kimble et al., 2013) For children weighing between 10-20 kg, the recommended dose is 1L + 50 mL/kg/day for each kg over 10. Based on this fluid volume, the following calculation can be made:

Total fluid requirement (1000 mL) + (3 x 50 mL) = 1150 mL/day

1150 mL/24 hours = 47.910 mL/hour or 0.798 mL/minute

If calculated using the macro drop factor, 1 mL = 15 drops, then

0.798 mL/minute x 15 drops/mL = 11.97 mL = 12 tpm

If used using micro droppers, 1 mL = 60 drops, then

0.798 mL/minute x 60 drops/mL = 47.88 mL = 48 tpm

Oral rehydration or intravenous rehydration is the first choice for pediatric patients suffering from GEA with mild to moderate rehydration (Edy Paturusi et al., 2024). The use of Vometa syrup 2x 1/2 cth (domperidone) and Trovensis injection (ondansetron 8 mg) showed that in the context of emergency care, 6 out of 10 children aged 1-6 years due to AE and without severe rehydration can be given effective oral rehydration. In children who vomit continuously and/or refuse oral rehydration, a single oral dose of ondansetron reduces the need for intravenous rehydration, while domperidone is not effective for the symptomatic treatment of vomiting during AE. Another therapy given is seques (Cholestyramine), a bile acid sequestrant commonly used as first-line therapy for bile acid diarrhea. The use of cholestyramine therapy can shorten the duration of diarrhea without side effects in children who have received oral rehydration. Cholestyramine can be useful as an additional therapy after adequate rehydration. The next therapy is trimoxul syrup 2x 5 cc (trimetopim 80 mg + sulfamethoxazole 400 mg) / 10 mL. Empirically, the use of antibiotics is not recommended unless bacterial resistance is indicated. The results of the Antimicrobial Resistance in Indonesia (AMRIN-Study) study showed that of the 2,494 individuals tested, approximately 43% of *Escherichia coli* strains showed resistance to various antibiotics, such as ampicillin (34%), co-trimoxazole (29%), and chloramphenicol (25%). Meanwhile, in 781 hospitalized patients, it was found that 81% of *Escherichia coli* strains were resistant to antibiotics such as ampicillin (73%), co-trimoxazole (56%), chloramphenicol (43%), ciprofloxacin (22%), and gentamicin (18%) (Islamiah & Nadhiroh, 2023).

Cotrimoxazole is the antibiotic of choice for treating acute diarrhea, especially those requiring antibiotic therapy. Cotrimoxazole is a combination of sulfamethoxazole and trimethoprim in a 5:1 ratio (400 mg + 80 mg), which has a synergistic effect. Both components are bactericidal against the same bacteria and are widely used for various infectious diseases, including gastrointestinal infections, due to their lower risk of resistance (Wahyuni & Riska, 2021).

The main clinical symptoms of acute viral gastroenteritis include vomiting and diarrhea, often accompanied by malaise, nausea, abdominal cramps, and fever. Diarrhea typically lasts less than 7 days, improves after 1–3 days, and does not persist for more than 14 days; diarrhea lasting more than 14 days is considered chronic. Respiratory symptoms may occur with rotavirus infection; headache and myalgia may occur with norovirus infection. Rehydration therapy with fluids containing physiological concentrations of glucose and electrolytes is necessary to compensate for gastrointestinal fluid losses and meet maintenance needs. Oral rehydration therapy is as effective as intravenous (IV) fluid therapy for rehydration in children with mild to moderate dehydration. Measurement of serum electrolytes, creatinine, and glucose should only be considered in children with severe dehydration requiring



hospitalization and IV therapy. Antiemetic medications such as ondansetron can improve the success rate of oral rehydration therapy and minimize the need for IV therapy and hospitalization. The recommended dose of IV ondansetron is 0.1–0.5 mg/kg, with a maximum of 4 mg. The recommended dose of oral ondansetron is 2 mg for children weighing 8–15 kg, 4 mg for children weighing >15 to ≤30 kg, and 8 mg for children >30 kg. A single dose is usually sufficient but may be repeated if the child vomits within 15 minutes of administration. Antidiarrheal medications are not currently recommended for children. The antimicrobial nitazoxanide requires further study before its use in children can be recommended. Proper personal hygiene and handwashing are essential to prevent fecal-to-oral transmission of pathogens. Norovirus is currently the most common cause of viral gastroenteritis in children; an effective norovirus vaccine is expected to further reduce the incidence of viral gastroenteritis (Leung & Hon, 2021).

CONCLUSION

Acute gastroenteritis (GEA) in children is a common condition and can lead to serious complications, such as severe dehydration and even death, if not treated appropriately. The etiology of GEA is diverse, including viral, bacterial, and parasitic infections, with rotavirus being the most common cause in immunocompetent children. Primary treatment for GEA includes oral or intravenous rehydration, depending on the degree of dehydration, accompanied by symptomatic therapy such as antiemetics and, in certain cases, the rational use of antibiotics. Case studies have shown that administering KAEN 3B fluids according to daily requirements, along with the use of ondansetron as an antiemetic, effectively accelerates symptom recovery and prevents the need for intravenous rehydration. The administration of cholestyramine as an adjunct therapy can also accelerate recovery without significant side effects. The use of antibiotics such as cotrimoxazole needs to be selective, given the high resistance rates found in national surveys. Therefore, management of GEA in children must be holistic and evidence-based, taking into account the rationality of antibiotic use, fluid requirements, and other supportive therapies. Prevention through personal hygiene and vaccination are also important steps to reduce the incidence and mortality from GEA.

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