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TREATMENT OF GASTROENTERITIS IN COVID-19 CHILDREN

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Introduction

SARS-CoV-2 is highly contagious and has resulted in a rapid pandemic of COVID-19 that posing a threat to public health. They are causing a severe acute respiratory syndrome and known to infect the neurological, enteric, and hepatic systems. The aim of this document is to provide recommendations for a systematic approach for the gastroenteritis treatment in COVID-19 children where most important treatment options where discussed.

Potential gastroenteritis treatment in COVID-19

Probiotics, are live microorganism and "nutrition boosters" that are keys to good gut health that provides health benefits when consumed. The role of probiotics in the treatment of acute (viral) gastroenteritis in infants and children has been investigated by a large number of clinical trials. ORS alone does not decrease the duration of diarrhea. Several randomized controlled trials and meta-analyses suggested that probiotics such as Lactobacillus rhamnosus are effective in primary and secondary prevention of gastroenteritis and its treatment. Probiotics, specifically Lactobacillus rhamnosus GG (LGG), act as adjunctive treatment of infantile gastroenteritis together with ORS and shorten diarrhea from acute gastroenteritis (AGE), shown in a meta-analysis study.

Kaolin has been used to control diarrhea, when given to patient, kaolin, especially light kaolin, adsorbs substances from the GI tract and increases the bulk of feces. Moreover, kaolin improves stool consistency but does not decrease the number of stools passed or reduce the amount of fluids lost. The effect of a kaolin—pectin antidiarrheal mixture was evaluated when the antidiarrheal. When two doses of antidiarrheal were given, kaolin—pectin suspension on steady-state plasma levels of digoxin appears inconsequential in patients on chronic oral digoxin therapy.

Dioctahedral smectite (DS) is natural adsorbent clay, capable of adsorbing viruses, bacteria, and other intestinal irritants in vitro useful in treating acute diarrhea. When eight hundred four children with acute diarrhea were randomly assigned to treated study group, the result clearly showed that DS reduces the duration of diarrhea, the consistency of stools improved but the number of bowel movements also decreased. In another study, the effect of DS on the duration of diarrhea and the frequency and amount of liquid stools was tested, where ninety well-nourished boys, aged 3-24 months, with acute watery diarrhea and mild, moderate, or severe dehydration were included in a randomized double-blind, placebo-controlled trial. Shorter duration of diarrhea and significantly fewer stools were observed in these boys. However, the amount of liquid stools was not significantly reduced [1].

Bismuth subsalicylate, also commonly known as *pink bismuth,* is an antacid medication used to treat temporary discomforts of the stomach and gastrointestinal tract. The therapeutic efficacy of bismuth subsalicylate in the severity and duration of the illness in 32 volunteers was examined in a randomized double-blind fashion study. The median duration of illness was 20 hr in the treatment group and 27 hr in the placebo group, but there was a significant reduction in the severity and duration of abdominal cramps and in the median duration of GI symptoms. In another study, Loperamide hydrochloride was compared with bismuth subsalicylate for the treatment of acute nondysenteric travelers' diarrhea. It was been noticed that students receiving loperamide

passed fewer unformed stools when compared with the bismuth subsalicylate group. The authors testified that loperamide is a safe and effective alternative to bismuth subsalicylate for the treatment of nondysenteric travelers' diarrhea [2].

Loperamide is used to treat traveler's diarrhea. It decreases the number of bowel movements in sudden diarrhea and makes the stool less watery by works by slowing down the movement of the gut. Loperamide was found to have no significant effect on the course of acute gastro-enteritis in early childhood with toxic effects in the treatment of acute infantile gastro-enteritis in hospital-based double-blind clinical trials carried out in parallel in Liverpool, England and Benghazi, Libya.

Racecadotril**,** also known as acetorphan, is an effective and safe drug in the treatment of acute diarrhea in adults and children. In ordear to find out whether treatment with racecadotril and oral rehydration therapy is more effective than treatment with oral rehydration alone, a study was conducted on boys who had watery diarrhea of five days' duration or less. The duration of diarrhea was significantly less in the racecadotril group than in the placebo when the boys were treated with racecadotril, in addition to oral rehydration solution. They concluded that in young boys with acute watery diarrhea, racecadotril is an effective and safe treatment. Torrez Sori and Grandy found that the use of racecadotril decreased the duration and magnitude of acute watery diarrhea in children under 5 years old. Despite its effect on duration of diarrhea, there were no differences regarding duration of fever or vomiting.

Promethazine **(**Phenergan**)** is used for treating the discomforts of a common cold like sneezing, coughing, nausea, vomiting and runny nose. The use of promethazine suppositories for children with gastroenteritis was reported by Christakis et al. Participants were divided into two groups: 'promethazine exposed' and 'promethazine non-exposed' and 14% of children hospitalized with gastroenteritis were treated with promethazine prior to hospitalization.

Ondansetron, an antiemetic, is a medication used to prevent nausea and vomiting and gastroenteritis, has little effect on vomiting caused by motion sickness, and is in consideration in literature for its use in vomiting secondary to acute gastroenteritis in children. In a study, 215 children 6 months through 10 years of age received oral-rehydration therapy, lead to the finding that a single dose of oral ondansetron reduces vomiting and well suited for use in the emergency department. In that study, Freedman states that children who received ondansetron were less likely to vomit, vomited less often, had greater oral and was less likely to be treated by intravenous rehydration. It was reported that time spent into the short-stay observation unit in pediatrics emergency department was significantly reduced after ondansentron.

Dimenhydrinate plus oral rehydration was effective in reducing the frequency and duration of diarrhea in children. However, dimenhydrinate did not significantly decrease the frequency of vomiting in children with acute gastroenteritis.

Zinc is an essential mineral that is naturally present in some foods and is important for cellular growth, cellular differentiation and metabolism and deficiency limits childhood growth and decreases resistance to infections. It not only plays a role in immune function, but has anti-diarrheal effect. Mild to moderate zinc deficiency may be common worldwide. Zinc supplementation has been shown to reduce the duration and severity of diarrhea, and to prevent subsequent episodes. In a study of randomized controlled trials, which study the effects of supplementary oral zinc in children aged <5 y with acute or persistent diarrhea, it was found that Zinc supplementation reduces the duration and severity of acute and persistent diarrhea. In another study, the efficacy of zinc and copper supplementation was evaluated when given with standard treatment to children with acute watery or bloody diarrhea using a double-blind randomized controlled clinical trial in the Department of Pediatrics at Indira Gandhi Government Medical College Nagpur, India. They found that therapeutic Zn or Zn and Cu supplementation may not have a universal beneficial impact on the duration of acute diarrhea in children. Nevertheless, a beneficial effect of zinc administered during acute diarrhea on stool output, diarrheal duration, and proportion of episodes lasting more than 7 days were demonstrated by Bhatnagar at al.[3]

Recombinant human hyaluronidase (rHuPH20) is a human, DNA-derived, hyaluronidase enzyme. rHuPH20-facilitated subcutaneous hydration seems to be safe and effective for young children with mild/moderate dehydration and can be used in both the inpatient and outpatient settings. Rehydration study which assess efficacy, safety, and clinical utility of recombinant human hyaluronidase (rHuPH20) reveals that subcutaneous hydration seems to be safe and effective for young children with mild/moderate dehydration

Conclusion

Children can be more prone to viral gastroenteritis infections compared to adults. Oral rehydration solutions such as the World Health Organization solutions are the cornerstone of treatment for bacterial or viral pathogen that causes gastroenteritis. Treatment is meant to keep the body hydrated, not to lose too much salt, such as

sodium and potassium. It is recommended some pharmacologic and adjunct therapies to be additional to ORS therapy. Zinc supplementation along with other adjunct therapies is a safe and effective measure to shorten the illness and to reduce other complications including death.

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