

# An algorithmic approach to children's gastroenteritis in SARS-CoV-2 epidemic: Iranian expert's consensus statement

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## Abstract

Diarrhea, vomiting and fever are common symptoms in pediatrics; on the other hand, recent studies have shown that, gastrointestinal symptoms are increasing in patients with COVID-19. This fact indicates the need to develop a screening and diagnostic algorithm in dealing with a patient with gastroenteritis in the epidemic SARS-CoV-2.

## An algorithmic approach to children's gastroenteritis in SARS-CoV-2 epidemic: Iranian expert's consensus statement

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## Abstract:

*Diarrhea, vomiting and fever are common symptoms in pediatrics; on the other hand, recent studies have shown that, gastrointestinal symptoms are increasing in patients with COVID-19. This fact indicates the need to develop a screening and diagnostic algorithm in dealing with a patient with gastroenteritis in the epidemic SARS-CoV-2.*

**Keywords :** SARS-CoV-2; gastroenteritis; algorithmic approach; children

**Abbreviations:** MIS-C, Multisystem Inflammatory Syndrome in Children; COVID-19, corona virus disease 2019; ACE2, Angiotensin converting enzyme 2; AT2, Alveolar type 2 progenitor cells; RICH, Research Institute for Children's Health.

## Introduction

Diarrhea, vomiting and fever are common symptoms in children, while the fifth most common clinical findings of COVID-19 disease are gastrointestinal symptoms. On the other hand, the hypothesis that SARS-CoV-2 is much lower in children than in adults has been questioned. And the evidence suggests that prevalence of SARS-CoV-2 in children is not 2%, but 15%. [1] Now, the question arises that, in which patients should we suspect SARS-CoV-2 related gastroenteritis given that diarrhea can have viral, bacterial, parasitic, and non-infectious causes?

Clinical studies have shown that, expression of the Angiotensin-Converting Enzyme 2 (ACE2) is not only high in the lung AT2 cells, but also in GI tract especially upper esophagus, liver, epithelial cells and absorptive enterocytes from ileum and colon [2, 3] and then, gastrointestinal symptoms such as diarrhea will occur. According to studies, intestinal involvement and diarrhea is seen in 2% to 50% of COVID-19 cases, as well as in 20 to 30 % of cases, gastrointestinal findings such as diarrhea are the first presentation of the disease and pulmonary symptoms appear in the following days. So involvement of the gastrointestinal tract and lungs may occur independently of each other.[4]

Usually at this stage of the disease, there is diarrhea without mucus and blood, but if there are complications such as pseudomembranous colitis, intussusception and HUS, there will be exudative diarrhea. Although in COVID-19 disease, diarrhea may be due to drug side effects, but the gastrointestinal tract can be directly involved through ACE2 receptors and indirectly through the gut lung axis. Also in Multi systemic inflammatory syndrome (MIS-C) caused by SARS-CoV-2, diarrhea can be watery or exudative. The average duration of diarrhea in COVID 19 is 4 days and the frequency of defecation varies from 3 to 30 times per day.[4, 5] The number of virus particles in the feces of patients with diarrhea is higher than in patients without diarrhea, and the virus is excreted in the feces for several weeks.

Intestinal involvement in COVID-19 has been reported in up to 50% of studies. The duration of hospitalization, duration of elevated liver enzymes, coagulopathy and high inflammatory markers in patients with diarrhea are higher than patients without diarrhea, and if these conditions are observed, the patient's prognosis is worse.[4, 6, 7]

## Algorithmic approach to a child with acute gastroenteritis in COVID-19 epidemic [8, 9]

## Conclusion

In the current SARS-CoV-2 epidemic, all the focus is on the respiratory symptoms of the disease, while recent studies have shown that, gastrointestinal symptoms such as diarrhea are increasing in patients with COVID-19. The number of days from the onset of symptoms to hospitalization is significantly higher in patients with gastrointestinal symptoms compared to patients without gastrointestinal symptoms; as a result complications and prognosis are worse in patients with gastrointestinal symptoms.[7] This fact indicates the need to develop a screening and diagnostic algorithm in dealing with a child with diarrhea in the epidemic SARS-CoV-2. [4]

In any patient with acute and watery diarrhea, with or without vomiting, abdominal pain, fever, or respiratory symptoms, if it has one of the following:

- A history of contact with a known or suspected case of COVID-19 patient.
- A history of traveling to infected areas or presence in crowded places.
- Unexplained sign and symptoms of other organ involvement such as respiratory or cerebral system.
- Lymphopenia, impaired liver function tests or increased inflammatory markers in lab tests.

The following steps must be taken:

1. Preventive precautions should be taken according to the last version of protocol (approach to a child suspected to COVID-19). Patients should be placed in an isolated room, the care giver must wear

appropriately mask on face, and avoid direct contact with respiratory and other secretions and should also wash hands with soap and water. [8, 10, 11]

2. According to the recommended protocol, send CBC, CRP, a sample for SARS-CoV-2 PCR and CXR with or without CT; and also appropriate treatment measures includes supportive care and special treatment should be considered.[8, 11]
3. Evaluate patient for Multi systemic inflammatory syndrome (MIS-C) criteria in according to the last protocol (approach to a child with MIS-C suspected to COVID-19).[12]
4. After discharge, the patient should be isolated at home and preventive measures and warning signs should be taught to the patient and remind him that come back to hospital if warning signs develops.

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Comments on gastroenteritis caused by SARS-CoV-2

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Absence of respiratory symptoms (cough, dyspnea, sore throat and rhinorrhea) in children with diarrhea does not rule out COVID-19

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## Footnotes

**Conflict of Interests:** No conflict of interest has been expressed by the authors.

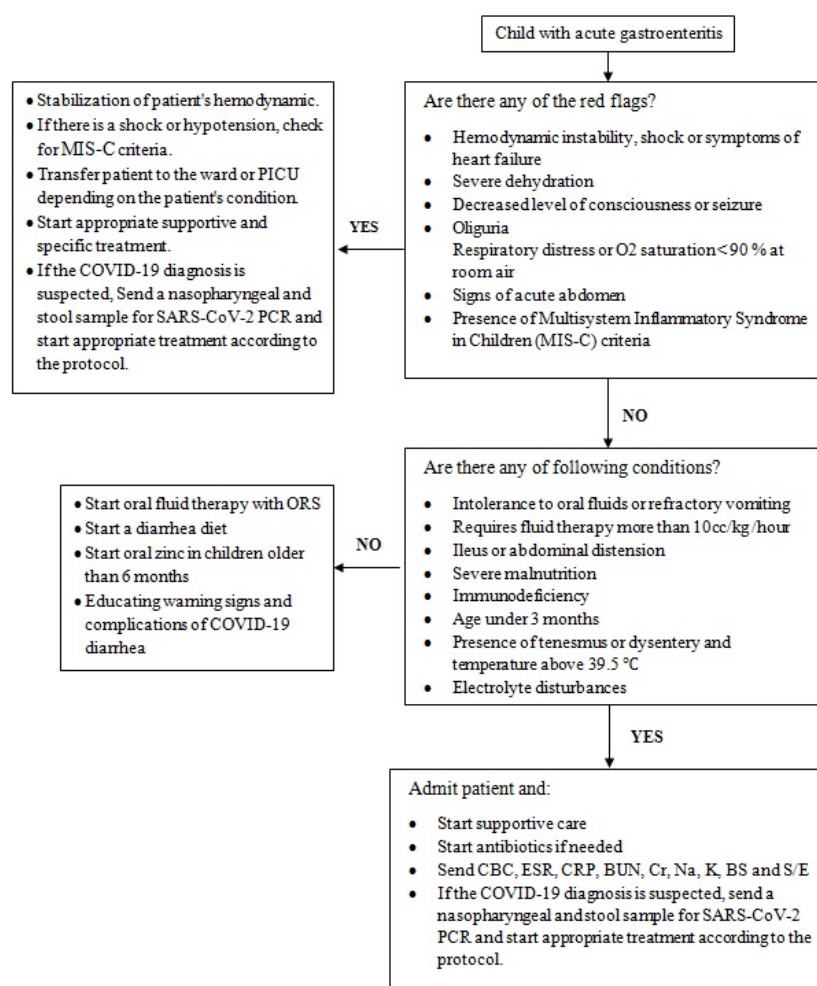
**Ethical approval:** Not required for this consensus statement.

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