



Research Article

Recommendations for management strategies for children with inflammatory bowel disease during the epidemic of new coronavirus (COVID-19) infection

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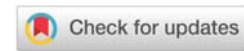
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Abstract

The novel Coronavirus, COVID-19, is highly infectious is mainly transmitted from an infected person through liquid droplets. Most patients have a good prognosis, a few patients are in critical condition. Children's infections are relatively mild, without fever and pneumonia and since they have the characteristics of clustering onset, they are easy to miss diagnosis and are thus more likely to cause disease transmission. Children with inflammatory bowel disease need to travel to and from the hospital multiple times to receive treatments due to this disease's own characteristics, which in turn increases their risk of infection. Therefore, management recommendations for children with inflammatory bowel disease through a network platform during the pandemic of COVID-19 infection are proposed.

Introduction

In December 2019, the new coronavirus (Severe acute respiratory syndrome coronavirus 2) (SARS-CoV-2) was first reported in China, with Wuhan, Hubei, being the epicenter of the outbreak. Since then, it has spread to provinces and cities (including Hong Kong, Macao and Taiwan) and more than 100 countries. Viral transmission is mainly through respiratory droplets and close contact with an infected person during the viral incubation period. In addition, some spread has been reported to occur from persons that show no symptoms (asymptomatic infections). Aerosol transmission and faecal-oral transmission of the virus through the digestive tract are not yet clear. The older population and persons with underlying medical conditions are more susceptible to this disease, while cases of childhood infections have occurred [1]. Pneumonia

caused by a new coronavirus infection is named COVID-19 (Corona virus disease 2019). COVID-19 patients present with mainly fever and respiratory symptoms, and gastrointestinal symptoms may also appear. In some cases, gastrointestinal symptoms are the first manifestation [2]. Inflammatory Bowel Disease (IBD) is a group of non-specific chronic gastrointestinal inflammatory diseases of unknown cause, including Crohn's Disease (CD), Ulcerative Colitis (UC) and unshaped IBD. IBD is often associated with fever, stunted growth, malnutrition, delayed puberty, anemia, arthritis, primary sclerosing cholangitis, nodular erythema, bowel stricture, anal fistula, perianal abscess, etc., and requires long-term treatment and follow-up. During the pandemic, children with IBD may be using drugs that affect immune function, such as hormones, immunosuppressive agents, or biological agents, and require multiple outpatient follow-up or hospital treatments. Children



with IBD are at high risk during the major pandemic of new coronavirus infection. Management, family care, and outpatient follow-up of children with IBD also face challenges. With the popularity of the Internet, our communication methods have undergone tremendous changes. The Internet has largely replaced traditional media such as newspapers and televisions as the primary channel for obtaining information. With the popularity of 5G networks and the development of the communications industry, mobile phones and the Internet have become necessities of our lives. In order to minimize the exposure of children with IBD to COVID-19, we have adopted WeChat and mobile apps combined with video follow-up Methods to help solve their follow-up and treatment problems; these specific strategies are summarized below.

Risk classification

Children with IBD who are at High Risk for New Coronavirus Pneumonia: Based on the clinical evaluation and stage of the disease, we have positioned the following children at high risk: (1) in the induction remission phase, (2) Children with genetic defects as confirmed by genetic testing: such as patients with genetic defects in the IL-10 receptor, (3) children with comorbidities requiring follow-up: such as combined with moderate or higher malnutrition, intestinal stenosis, perianal disease, etc. and (4) children in major pandemic areas.

Children with IBD who are at moderate or lower risk of new coronavirus pneumonia: (1) children in maintenance therapy, (2) no history of disease in the pandemic area, (no use of immunosuppressants and biological agents to treat children).

Precautions

1. Strictly abide by the residents' life recommendations for pandemic prevention and control. At the same time, it is emphasized that children with IBD self isolate.
2. Strengthen the health education and preventive measures of the accompanying family members: The risk of infection of IBD children by COVID-19 increases with parents going out to the clinic. Therefore, it is very important to protect the home and reduce the risk of infection caused by parents going out. This requires parents to strictly abide by the relevant levels of management's requirements for epidemic prevention and control, with a focus on home ventilation and disinfection; families with conditions recommend that low-risk personnel take care of children with IBD.

Timely counseling for children: Due to the characteristics of the disease, long-term follow-up and treatment of children with IBD often affects the child's psychology. In addition to the cause of the COVID-19 pandemic, the child may not fully understand the pandemic situation, which is likely to cause negative reverie being unable to go out from the home for a long time, which can also cause unpleasant emotions. Parents should change their minds at this time, and should inform the children of the current epidemic situation scientifically, and create a good family atmosphere, actively communicate and enlighten, and can relieve children's tension and anxiety

by appreciating soothing music and breathing training, and ensure the greatest degree daily activities [3,4].

Effective use of online platforms

During the epidemic, we should effectively use online platforms such as WeChat groups and public accounts to track and manage children. The specific methods are as follows:

1. Establish a WeChat group for children with IBD, and release relevant information accurately and timely.
2. Create a public account for children with IBD, and regularly publish nursing knowledge about IBD. Through videos or texts, parents can get a better understanding of IBD diseases and achieve a more scientific and effective home treatment effect.
3. Digestive medical staff is responsible for paying attention to and responding to the various information of the children in the IBD public account and WeChat group.
4. Make relevant forms to record the daily stool and other lesions of children, quantify each indicator, and facilitate parents to record and make doctors better understand the changes of children's conditions.
5. Using a public account or an online consultation platform, the patients of IBD children can upload test sheets, fecal pictures, and skin lesion changes for consultation in real time. While paying attention to protecting privacy, they can further determine whether they need to come to the hospital for treatment.
6. For Children with IBD who are at high risk for new coronavirus pneumonia, use the online platforms to conduct regular inspections to determine the clinical activity of the disease and clinical scores, and receive treatments and nursing guidance.

About the outpatient consultation process for children with IBD

Appointment scheduling: In order to avoid the risk of infection that may be caused by frequent medical appointments, patients should try to make appointments for specialist outpatient visits, avoid visiting high-risk clinics such as popular clinics, infection departments, and respiratory departments, or consider blood routine and liver and kidney in the nearest community hospital Work detection [5]. Parents of children with IBD can keep in touch with the attending doctor through the IBD WeChat group, or through various forms of online consultation. If the child is generally in good condition or stable, you can continue to observe at home and provide timely feedback.

Special Outpatient Clinic

- a) When the child has fever, vomiting, diarrhea, etc., after ensuring that the following conditions are eliminated, online consultation and community clinic visits can be

used to determine the cause of the symptoms such as: (1) recent travel history of the child to exclude travel to territories with the outbreak of COVID-19 within the past 14 days; (2) have not come in contact with patients either presenting with fever and respiratory symptoms or persons that have travelled to pandemic-stricken areas within 14 days; (3). No cluster incidence.

- b) An appointment with a digestive specialist should be arranged in a timely manner when the child has the following symptoms: (1) the abdominal pain becomes worse and cannot be tolerated; (2) a large amount of blood in the stool; (3) Intolerable or febrile perianal swelling and pain; (4) more bleeding or fever in the fistula; (5) Persistent fever.

Hospitalization

For admitted patients, medical staffs need to inquire about related medical history (especially related epidemiological history of family members) at the time of admission, and screen for suspicious cases again. All hospitalized specialists must sign a hospital commitment to prevent and control the new coronavirus-infected pneumonia when they are admitted. The ward is strictly protected and disinfected. A low-risk person will accompany the patients. Other relatives should be prohibited from visiting the infected patient to ensure the safety of patients and wards and restrict further transmission of the virus.

Drug treatment during the epidemic for children with IBD

Induced remission children: With strict protective measures in place, it is not recommended to postpone the use of biological agents or immunomodulators. If the condition is stable, continue the original treatment. Additionally, it is not recommended to add immunosuppressive agents or increase the dose of immunosuppressive drugs during the SARS-CoV-2 outbreak. For patients treated with Infliximab monoclonal antibody or adalimumab, it is recommended that SARS-CoV-2 virus screening and lung CT examination be performed before medication, except for the possible case of SARS-CoV-2 infection; Mesalazine and thalidomide treatment can continue to be applied. For those who cannot go to the hospital to maintain medications due to epidemic related factors, it is recommended to use enteral nutrition to survive the epidemic period [5].

Maintenance treatment of children with IBD: Children in the remission phase of the disease should receive continuous drug treatment while in a stable condition. In children who are treated with biologics for maintenance treatment, the regular maintenance medication cycle is intravenous drip infusion once every 8 weeks. During the non-peak period of the COVID-19 pandemic, children can be treated in the hospital normally according to the prescribed time; during peak pandemic situations or in regions severely afflicted with COVID-19, medication can be postponed for 1 to 2 weeks as appropriate [5]. For children who can't go to the hospital for various reasons, especially those with mucosal healing time less than 1 year, it is recommended to use enteral nutrition.

Children requiring surgery: During the pandemic, children who meet the indications for surgery while elective surgeries are postponed; Limited-term surgery, such as complicated intestinal obstruction and parenteral fistula, can be temporarily fasted and treated with parenteral nutrition, the operation is delayed as appropriate; Emergency surgery, such as acute perforation, major bleeding, etc.: (1) For children with IBD who have no history of epidemiological contact with SARS-CoV-2 virus infected persons and/or presenting with fever, etc., surgery can be performed in a single surgical isolation room based on strict personal protection protocols. The prevalence of the SARS-CoV-2 virus in the patient should be checked simultaneously; (2) For children with IBD that are suspected or diagnosed with SARS-CoV-2 infection, the operation must be performed in a negative pressure operating room with strict protective measures, or in a designated hospital, with specific reference to the "COVID-19 epidemic situation Implementation of pediatric surgical diagnosis and treatment" [6].

Enteral nutrition treatment: At present, Exclusive Enteral Nutrition (EEN) has become the first-line treatment option for children with active CD [7]. EEN can not only improve the nutritional status and quality of life of children, but also induce CD remission, reduce intestinal mucosal inflammation, and promote intestinal mucosal healing [8]. During the pandemic protocols enacted in infected territories enteral nutrition is recommended for treatment.

Children with induced remission: Studies have confirmed that EEN is significantly better than hormonal treatment in reducing both the short-term intestinal mucosal inflammation and inhibiting the expression of intestinal mucosal inflammatory cytokines [9], in children with IBD. Additionally, EEN has been shown to also reduce the children's CDD activity index (PCDAI) [10] and according to China's IBD expert consensus, children and adolescents can use EEN to support the induced remission period [7]. Therefore, it is recommended that IBD children in the induction remission period do not adjust the treatment plan without authorization and can use enteral nutrition to pass the pandemic period if they cannot go to the hospital to maintain medication.

Children during maintenance treatment: Studies have demonstrated that compared with a standard diet, 5-aminosalicylic acid (5-ASA), azathioprine treatment or maintenance of EEN is more effective in preventing CD recurrence [11]. Therefore, children in the pandemic period should continue maintenance treatment according to the original maintenance treatment plan. If children treated with medication cannot go to the hospital for medication, it is recommended to use enteral nutrition.

For gastrointestinal endoscopy: Because viral nucleic acid is isolated from the stool of patients with COVID-19, the possibility of gastrointestinal transmission is not excluded. Therefore, during the peak of the pandemic, endoscopic examination is not recommended and can be changed to elective examination. If the condition urgently requires endoscopic diagnosis and treatment, such as major bleeding, perforation, etc., it should be carried out according to the "Prevention and Control Plan



of Children's Digestive Endoscopy Center for New Coronavirus Infection" [12].

Management of children with IBD complicated by COVID-19 infection

If the new coronavirus infection is confirmed in IBD children undergoing immunomodulatory therapy, regardless of the period, the following course of action is recommended: (1) immediate withdrawal of immunosuppressants (azathioprine, methotrexate, etc.) and biological agents (infliximab) for at least 7 days are recommended and corresponding treatment of symptomatic patient with antivirals until respiratory symptoms reach clinical cure standards; (2) Mesalazine, glucocorticoid, and thalidomide applications are not affected, but the drug dose needs to be adjusted according to the condition [13-15]. (3) Enteral and parenteral nutrition therapy should be used continuously or even strengthened if necessary.

Vaccination recommendations for children with IBD during the outbreak

At the beginning of the COVID-19 outbreak, the Children's Health Branch of the Chinese Preventive Medicine Association recommends that children's vaccines be delayed in order to reduce the risk of infection caused by factors such as the gathering of people and large crowds. With the further control of the epidemic, the following recommendations are made for the vaccination of children with IBD for different risk areas.

For children with IBD who are not receiving immunosuppressive agents and hormone maintenance therapy during the remission period, the vaccine immunization shall be carried out according to the "Safety and Effectiveness Analysis and Vaccination Recommendations for Delayed Vaccination During the Epidemic of New Coronavirus Pneumonia" [16]. Mainly according to the local epidemic situation, vaccination can be performed normally in areas with mild or no epidemic situation; for areas with severe epidemic situation, it is recommended to appropriately delay vaccination. Corresponding studies have shown that delaying vaccination within a certain period of time has limited impact on the safety and effectiveness of the vaccine [16].

Children with immunosuppressive agents and biological agents: Delayed vaccination with live attenuated vaccines, such as BCG vaccine, polio vaccine, hepatitis A vaccine, and some Japanese encephalitis vaccines. Treatment of children with hormones and immunosuppressants should be given at least 1 month after the end of treatment [17]. Children receiving infliximab should be vaccinated 3 months after the end of treatment.

Emergency vaccines, such as tetanus and rabies vaccines, should be vaccinated urgently.

Result and prospect

During the epidemic, our hospital adopted WeChat and mobile App video follow-up methods for 35 IBD patients, and adopted the above relevant recommendations. Among them,

32 were in stable condition and successfully passed the severe epidemic period, and 3 of them experienced relapse. Two of them were due to prolonged use of infliximab; the other was due to hormone reduction. Failure to add immunosuppressants in time caused a relapse.

According to the establishment of the online platform and the results obtained, in today's society, the rational use of the online platform to achieve the management of children, follow-up, diagnosis and treatment of special periods and timely feedback of parents' opinions is a new development direction. Reasonably use network technology to establish an inflammatory bowel disease management platform, even a chronic disease management platform. IBD patients in various regions can use this platform to track their condition and conduct joint consultations, which is also more conducive to hospital management of patients.

In short, the global pandemic is still severe, and children with IBD are more susceptible and should pay close attention to it. It is recommended adhere to personal protective protocols during the pandemic and utilize WeChat and online consultation platforms to keep in touch with pediatric digestive experts or physicians in charge. Standardized treatment and effective management can reduce the risk of SARS-CoV-2 infection.

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