Letter to Editor:
COVID-19 in Children Managed Without Antiviral Drugs

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Letter to Editor

Coronavirus Disease 2019 (COVID-19) manifests with various symptoms and complications, but it generally presents with milder symptoms in children. There are different published guidelines about the management of COVID-19 in children. We share our experiences in managing moderate to severe presentations and complications of the disease in a tertiary children's hospital in the north of Iran. Our recommendation for the management of MIS-C (multisystem inflammatory syndrome in children) patients in the presence of coronary artery involvement starts with 2 g/kg Intravenous Immunoglobulin (IVIG) and in resistant cases, or the presence of myocarditis methylprednisolone pulse therapy in three consecutive days. Pulse therapy is also recommended in cases without coronary artery involvement as the first step of treatment. Other essential conservative management strategies are albumin replacement, hemoglobin monitoring, inotropes, meticulous use of antibiotics, and anticoagulants. All cases with MIS-C must be admitted to the pediatric intensive care unit. Moderate to severe cases are managed with supportive care, including hydration, vitamin D, vitamin C, zinc, and, if indicated, supplementary oxygen, and antibiotics. The most important part of the management of MIS-C is close monitoring of cardiovascular function, supportive care, and administration of corticosteroid and IVIG.

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2) has spread all over the world. It causes Coronavirus Disease 2019 (COVID-19), which presents with various symptoms and complications (1). The first reports of COVID-19 showed low incidence and milder form of the disease in children. Still, after accumulating cases, several reports of moderate to severe forms of the disease in children, including MIS-C (multisystem inflammatory syndrome in children) or PIMS (pediatric inflammatory multisystem syndrome), were published. MIS-C may lead to life-threatening complications and involves several systems, including the cardiovascular, respiratory, gastrointestinal, central nervous system, urinary systems, etc. (2, 3).

According to the severity and most involved organs in COVID-19 children, the disease could be categorized into four major forms: 1. Respiratory, 2. Gastrointestinal, 3. Fever and rash, 4. MIS-C. Kawasaki Disease (KD), like the presentation of COVID-19, may appear manifestations very similar to KD disease but show more frequent complications like thrombocytopenia, myocarditis, and hypoalbuminemia (1, 2).

There are different published guidelines about the management of COVID-19 in children. Because these guidelines are not based on well-designed clinical trials, the certainty of the evidence generated is unreliable (4, 5). We share our experiences in the management of moderate to severe presentation and complications of the disease in a tertiary children's hospital in the north of Iran, which was one of the first centers in the country involved in the management of the disease caused by the virus.

There are some antiviral drugs mentioned in the guidelines of COVID-19 management, including remdesivir, kaletra, fa-

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vipiravir, etc. There are no published articles with strong evidence regarding the efficacy of these drugs in the management of COVID-19, recovery of clinical manifestations, and reduction in hospital stay duration in children. Remdesivir was recently approved for children, and it is noteworthy that the anti-COVID-19 efficacy of this drug is not strong. Besides, most of these drugs should not be used in critical situations, such as disturbed liver function and elevated liver transaminases level (6, 7).

During the pandemic in our region, 172 SARS-CoV2 infected children (confirmed with RT-PCR or detection of antivirus immunoglobulin [COVID-19 IgM or IgG], or probable COVID-19 compatible complaints and history of close contact with an infected person) admitted to the hospital, and less than 10% of them received any kind of antiviral agents (kaletra and remdesivir). One patient who was obese died despite receiving remdesivir. Therefore, available management strategies regarding COVID-19 infected children were planned and implemented in the hospital, coupled with close monitoring.

Our recommendation for the management of MIS-C patients in the presence of coronary artery involvement starts with 2 g/kg Intravenous Immunoglobulin (IVIG) and in resistant cases, or the presence of myocarditis starts with methylprednisolone pulse therapy in 3 consecutive days. Pulse therapy is also recommended in cases without coronary artery involvement as the first step of treatment. Other essential conservative management strategies are albumin replacement, hemoglobin monitoring, inotropes, meticulous use of antibiotics, and anticoagulants. All cases with MIS-C must be admitted to the pediatric intensive care unit. Moderate to severe cases are managed with supportive care, including hydration, vitamin D, vitamin C, zinc, and, if indicated, supplementary oxygen, and antibiotics.

In conclusion, most of our patients discharged with a good general condition, and nearly 90% of them did not receive any antiviral agents. No one was intubated, except an obese boy, who died with multi-organ failure. Even other treatments and expensive drugs, including anti-IL6 (tocilizumab) or anti-IL1 (anakinra), were not used in our patients, and no one underwent extracorporeal membrane oxygenation. The most important part of the management of MIS-C is close monitoring of cardiovascular function, supportive care, and administration of corticosteroid and IVIG.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article.

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Authors' contributions

Both authors equally contributed to preparing this article.

Conflicts of interest

The authors declared no conflict of interest.

References

1. Rahimzadeh G, Ekrami Noghabi M, Kadkhodaei Elyaderani F, et al. COVID-19 infection in Iranian children: A case series of 9 patients. Journal of Pediatrics Review. 2020; 8(2):139-44. [DOI:10.32598/jpr.8.2.139]

2. Shahbaznejad L, Navaeifar M R, Abbaskhanian A, Hosseinzadeh F, Rahimzadeh G, Rezai M S. Clinical characteristics of 10 children with a pediatric inflammatory multisystem syndrome associated with COVID-19 in Iran. BMC Pediatrics. 2020; 20(1):1-2. [DOI:10.1186/s12887-020-02415-z] [PMID] [PMCID]

3. Navaeifar M R, Ghazaghi M P, Shahbaznejad L, Rouhanizadeh H, Abutalebi M, Varandi M R, et al. Fever with rash is one of the first presentations of COVID-19 in children: A case report. International Medical Case Reports Journal. 2020; 13:335. [DOI:10.2147/IMCRJ.S262935] [PMID] [PMCID]

4. Centers for Disease Control And Prevention. Information for Healthcare Providers about Multisystem Inflammatory Syndrome in Children (MIS-C) [Internet]. 2020 [Updated: 2020 August 28]. Available from: https://www.cdc.gov/mis-c/hcp/

5. World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard [Internet]. 2020 [Updated: 2021 January 4]. Available from: https://covid19.who.int/?gclid=EAIaIQobChMIsICbo6mC7gIVSeDtCh2UjgI3EAAYASAAEgLWaPD_BwE

6. Karimi A, Rafiei Tabatabaei S, Rajabnejad M, Pourmoghaddas Z, Rahimi H, Armin S, et al. An algorithmic approach to diagnosis and treatment of Coronavirus Disease 2019 (COVID-19) in children: Iranian expert's consensus statement. Archives of Pediatric Infectious Diseases. 2020; 8(2):e102400. [DOI:10.5812/pedinfect.102400]

7. Chiotos K, Hayes M, Kimberlin DW, Jones SB, James SH, Pinninti SG, et al. Multicenter initial guidance on use of antivirals for children with COVID-19/SARS-CoV-2. Journal of the Pediatric Infectious Diseases Society. 2020. https://doi.org/10.1093/jpids/piaa045