



## Letter to the Editor

### COVID-19 in Omani Children with Hemato-Oncology Diseases

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#### To the editor.

In late December 2019, cases of pneumonia of unknown etiology were identified in Wuhan, the Hubei province's capital city in central China. In January 2020, the causative organism was identified as a novel coronavirus, and it was named a severe acute respiratory syndrome coronavirus - 2 (SARS CoV-2). In mid-March, the World Health Organization declared that coronavirus disease 2019 (COVID-19) is a pandemic due to the increase in the number of cases and mortality of COVID-19 worldwide.<sup>1</sup>

Globally, up to 27<sup>th</sup> July 2020, there have been more than 16 million confirmed cases, causing more than half-million deaths with an almost 4% fatality rate.<sup>2</sup> In Oman, COVID-19 was reported for the first time on 24 February 2020. As of 27 July 2020, 76,005 laboratory-confirmed COVID-19 cases were reported in Oman with a mortality rate of 0.5%. Up to this date, 4970 children <14 years of age were diagnosed with COVID-19, accounting for 6.5% of total confirmed cases with no recorded deaths.<sup>3</sup> In Oman, children with moderate and severe COVID-19 are managed as inpatients. A systematic review showed that COVID-19 in children tend to have milder disease and a better prognosis than adults.<sup>4</sup>

To the best of our knowledge, there were only ten children with haemato-oncology diseases required admission for COVID-19 in Oman for the last five months; seven of them have sickle cell disease, 2 with acute leukemia, and one a post-bone-marrow transplantation patient for primary immune deficiency. Three SCD patients were managed for acute chest syndrome (ACS), and two of them improved with IV fluids, antibiotics, exchange transfusion with and minimal oxygen support. The 3<sup>rd</sup> patient with SCD and ACS to required admission to high dependency for respiratory support. Two patients admitted with splenic sequestration and one with vaso-occlusive crisis (VOC) needed only the routine care. One patient came for short regular admission and found to have mild COVID-19.

COVID-19 poses a danger to children with

hemoglobinopathies, particularly those with SCD. SARS-CoV-2 affects primarily the respiratory tract, which puts children with SCD at risk of ACS.<sup>5,6</sup> From our experience in Oman over the last six months, it seems that children with sickle cell disease are more likely to develop moderate to severe COVID than children with other hemoglobinopathies, malignancy, and hematopoietic stem cell transplantation recipients. About half of our children with sickle cell disease who required hospitalization with COVID-19 in Oman have ACS. ACS is a major cause of morbidity and mortality in children with SCD.<sup>5-7</sup> The etiology of ACS in children is multifactorial, and the respiratory tract infections are a major trigger of ACS.<sup>5</sup> It results from increased adhesion of sickle cells to pulmonary microvasculature, infection, pulmonary fat embolism, and infraction, resulting in excessive inflammatory lung injury. The hyperinflammatory state in children with SCD secondary to COVID-19 may be enhanced by the pro-inflammatory state in SCD.<sup>5</sup>

There is limited literature in this area, but it was well observed during the influenza seasons (2003-2005) in the USA that children with SCD have 56 times more admission frequency than healthy children and twice as high compared to children with cystic fibrosis.<sup>6</sup> There is a potential risk that hydroxyurea can cause immunosuppression, which may result in severe viral illness. Splenectomy and functional splenectomy theoretically put these children at high risk of secondary bacterial infections associated with COVID-19 and probably worse outcome.<sup>6</sup>

One hundred seventy-eight patients, including children with SCD in the United States, were reported to an SCD-coronavirus disease case registry between March and May 2020; 69% were hospitalized, 11% require intensive care, and 7% died. 54% of this cohort reported >3 VOC requiring hospitalization, and 32% reported >1 ACS episodes. This suggests that children with SCD who become infected with SARS-CoV-2 are at a high risk of a severe disease course and have a high mortality rate.<sup>7</sup> A French study reported four children

with SCD infected with COVID-19 admitted to PICU with ACS required NIV and had a good outcome.<sup>8</sup> ACS seems to be the leading cause of PICU admission and death for this population, and it should be managed aggressively.

This letter suggests that in Oman, children with SCD

have probably the highest risk of developing severe COVID-19 infection among children with chronic hemato-oncology problems. We should highlight the importance of hand hygiene, staying home, and social distancing in this population, along with prompt medical review when sick with COVID-19.

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Laila S Al Yazidi<sup>1</sup> and Yasser Wali<sup>2</sup>.

<sup>1</sup> Infectious Diseases unit, Child Health Department, Sultan Qaboos University Hospital, Muscat, Oman.

<sup>2</sup> Haematology-oncology unit, Child Health Department, Sultan Qaboos University Hospital, Muscat, Oman.

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Correspondence to: Dr. Laila Al Yazidi. Child Health Department. Sultan Qaboos University Hospital. Al Koudh, Muscat Oman 123. E-mail: [dr.laila83@hotmail.com](mailto:dr.laila83@hotmail.com)

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