To the editor:

Pandemic influenza A (H1N1) virus infections in children with sickle cell disease

Pandemic influenza A (H1N1) virus infection was first identified in March 2009; more than 3000 deaths have been reported worldwide, with highest complication rates in those with preexisting medical conditions. Patients with sickle cell disease (SCD) are thought to be at increased risk of complications, although there are limited data supporting this.

Hospitals in London were contacted to ask for details of children with SCD and confirmed pandemic influenza A (H1N1) presenting between April and August 2009. Eight of 12 hospitals responded, reporting 21 cases among approximately 2200 children with SCD seen in those centers. All had sickle cell anemia (HbSS); 11 were female (median age, 7.9 years; range, 1-15 years). Two patients had cerebrovascular disease and were maintained on regular blood transfusions. Presenting symptoms included fever (19), cough (19), coryza/rhinorrhea (12), myalgia (11), dyspnea (8), headache (6), diarrhea and vomiting (3), and wheezing (2). Some children also presented with symptoms attributed to SCD including acute pain in the limbs, (10) chest (9), and abdomen (6).

H1 and N1 viral RNA was detected in combined nose and throat swab samples from all 21 children. All patients showed a fall in platelet count, with 3 showing trough levels of less than 100 × 10^9/L. There was also a highly significant fall in hemoglobin, with a smaller and less significant fall in reticulocyte count (Table 1). Seventeen patients had chest X-rays: 7 were normal, 2 showed unilateral consolidation, and 8 showed bilateral consolidation; 10 patients therefore had acute chest syndrome (ACS).

All 21 children were prescribed oseltamivir, with a median delay from the onset of symptoms of 3.2 days (range, 0-6 days). Seventeen were given broad spectrum antibacterial, and 18 intravenous fluids. Eleven children received blood transfusions, due to the combination of falling hemoglobin and ACS, including both those on regular blood transfusions. Nineteen were admitted to hospital, for a median of 3 days (range, 0-27 days). Four were admitted to high-dependency units and one to pediatric intensive care; one required mechanical ventilation. All patients recovered from the acute illness. Few oseltamivir side effects were reported, with 2 children developing diarrhea and nausea. One child, on regular transfusions with a history of splenomegaly, developed significant further splenic enlargement that continued for at least 2 months. The other child with known cerebrovascular disease on regular blood transfusion suffered a large intraventricular and subarachnoid hemorrhage 4 weeks after the diagnosis of pandemic influenza (H1N1). It was thought unlikely that this was directly related to the infection.

Based on weekly estimates by the United Kingdom Health Protection Agency, it was calculated that there should have been approximately 40 cases of pandemic influenza A (H1N1) among the 2200 children with SCD in this survey, suggesting that 50% presented to hospital and 25% developed ACS. This is a high complication rate compared with the estimated hospitalization rate of 7% for the general population. This influenza pandemic may be particularly devastating in Africa where the majority of children with SCD live, without access to safe blood transfusion, appropriate antibiotics, or vaccination.

Table 1. Comparison of laboratory data and oxygen saturations (measured by pulse oximetry) in the steady state and when acutely unwell with influenza A (H1N1)

<table>
<thead>
<tr>
<th>Laboratory value</th>
<th>n</th>
<th>Steady state</th>
<th>Acute</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>White blood cells, ×10^9/L</td>
<td>18</td>
<td>10.7</td>
<td>14.7</td>
<td>.022</td>
</tr>
<tr>
<td>Lymphocytes, ×10^9/L</td>
<td>17</td>
<td>3.8</td>
<td>3.1</td>
<td>.320</td>
</tr>
<tr>
<td>Platelets, ×10^9/L</td>
<td>17</td>
<td>404</td>
<td>222</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Hemoglobin, g/dL</td>
<td>19</td>
<td>8.3</td>
<td>6.5</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Reticulocytes, ×10^9/L</td>
<td>10</td>
<td>329</td>
<td>226</td>
<td>.127</td>
</tr>
<tr>
<td>Bilirubin, μmol/L</td>
<td>11</td>
<td>42</td>
<td>49</td>
<td>.414</td>
</tr>
<tr>
<td>AST, IU/L</td>
<td>10</td>
<td>42</td>
<td>70</td>
<td>.389</td>
</tr>
<tr>
<td>Oxygen saturation, %</td>
<td>18</td>
<td>96.6</td>
<td>92.7</td>
<td>.019</td>
</tr>
</tbody>
</table>

All data normally distributed (Kolmogorov-Smirnov test) and means compared using paired t-test.

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References


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