CLINICAL FEATURES OF INFLUENZA A (H1N1) IN CHILDREN AT DR SOETOMO GENERAL HOSPITAL

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ABSTRACT

The 2009 flu pandemic is global outbreak of new strain of influenza A virus subtype H1N1. Because symptoms of influenza A (H1N1) are similar to other, more information of precise clinical features of influenza A H1N1 needed to be understood. Prompt diagnosis and intensive therapy was associated with favourable outcomes. This study was to describe the clinical manifestation and laboratorical findings of all cases of influenza A (H1N1) in children in Soetomo Hospital Surabaya between July until September 2009. We collected data on patients admitted at Department of Child Health Soetomo hospital from July until September 2009 with confirmed influenza A (H1N1). Sex, age, nutritional status, symptoms, history of contact, laboratorical and radiological findings, and outcome were noted. Fifty two from 83 children with suspicious of influenza A (H1N1) had positive result of RT-PCR specimen. Most of their age were between 10-15 years (65%), with good nutritional status (75%). The most common clinical manifestation was cough (98%) and fever (68%). There were history of contact in 31 children (60%). Only 9.5% children revealed leukopeni, 29% thrombocytopenia and 65% with lymphopenia. From chest radiograph findings, there 35% children with abnormal findings, with the most common was patchy infiltrates. Fourteen children (27%) had underlying disease, and 10.6% of them were immunocompromised. Four patients (8.5%) transferred to ICU for ventilator support and two of them died due to respiratory failure. In conclusion, the most common clinical symptoms of swine influenza was cough and fever, with history of contact. There were unspecific laboratorical findings, with most of the chest radiograph revealed pneumonia. Mortality rate of children with respiratory failure was high.

Keywords: children, clinical features, influenza A H1N1

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INTRODUCTION

In late March and early April 2009, the first cases of a novel strain of influenza A (H1N1) virus infection were reported in Mexico. At first, it was called swine influenza but, subsequently the name was changed to influenza A (H1N1) by WHO’s recommendation (Bewick T, 2010; Park SI, 2010). In June 2009, the World Health Organization declared that the spread of the influenza A (H1N1) virus had reached pandemic level, phase 6, indicating widespread community transmission throughout at least two continents (WHO, 2009). In June 28, 2009, Indonesia Ministri of Health declared first two cases confirmed with influenza A (H1N1) were found in Indonesia (Depkes, 2009). The signs and symptoms of influenza caused by influenza A
Clinical Features of Influenza A (H1N1) in Children at Dr Soetomo General Hospital (Retno Asih Setyoningrum)

(H1N1) virus are similar to those seasonal influenza, though the real time reverse transcription-polymerase chain reaction (RT-PCR) test can differentiate between them (Park SI, 2010). Typical manifestations include fever, headache, cough, sore throat, myalgias. Diarrhea and vomiting may also occur. (Thorner, 2009). While most cases of pandemic influenza A (H1N1) infection have been mild or subclinical, some patients experienced severe illness from influenza A (H1N1) infection (Miller, 2010) and others severe influenza related complication (Kumar A, 2009). Early identification of patients with influenza A H1N1 may enable the early administration of antiviral agents with possible improved outcome. The aim of our study was to describe the clinical manifestation and laboratory findings of all cases of influenza A (H1N1) in children in Soetomo hospital between July until September 2009.

MATERIALS AND METHODS

We collected data on patients admitted at Department of Child Health Soetomo hospital from July until September 2009 with confirmed influenza A (H1N1). The diagnosis was confirmed by collecting throat swabs and doing RT-PCR for H1N1. Sterile swabs with cotton tips and wooden shafts were inserted into oral cavity of the patients. The throat swab was rubbed on the tonsilar surface or the pharyngeal mucosa that presented the most secretion under visual inspection. Sex, age, nutritional status, symptoms, laboratory and radiological findings, and outcome were noted. Nutritional status was determined based on percentage ideal body weight NCHS, divided in malnourished, normal nutritional status, overweight and obese. Clinical symptoms include fever (if temperature axilla ≥ 38oC), cough, diarrhea, seizure, dyspnea. History of close contact with a confirmed case of influenza A (H1N1) or recent travel to an area confirmed cases was recorded. Blood routine count were drawn to all of patients. Normal leukocyte count was 4,000-12,000/cm3. Leukopenia was leukocyte count less than 4,000/cm3. Normal thrombocyte count was 150,000-350,000/cm3, thrombocytopenia was thrombocyte count less than 150,000/cm3. Normal lymphocyte count was lymphocyte percentage 20-40%, lymphopenia was lymphocyte percentage less than 20%. All patients also underwent chest-X ray examination and the result was reviewed by pediatric respiriologist. Data were analized descriptively.

RESULTS

There were 83 children were hospitalized with suspicious of influenza A H1N1, fifty two from them had positive result of rt RT-PCR specimen. Patients are most predominant in the age group of 10-15 years (n=34, 65%). Most of the patients have good nutritional status (n=39, 75%). There were history of contact or travelling to a country with confirmed cases of influenza A (H1N1) virus in 31 children (60%) (Tabel 1).

Tabel 1. Characteristic of patients with confirmed influenza A H1N1 at Child Health Department Soetomo Hospital July until September 2009

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>≤5</td>
<td>5</td>
</tr>
<tr>
<td>5-10</td>
<td>9</td>
</tr>
<tr>
<td>10-15</td>
<td>34</td>
</tr>
<tr>
<td>Nutritional status (%IBW)</td>
<td></td>
</tr>
<tr>
<td>Malnourished</td>
<td>9</td>
</tr>
<tr>
<td>Normal</td>
<td>39</td>
</tr>
<tr>
<td>Overweight</td>
<td>1</td>
</tr>
<tr>
<td>Obese</td>
<td>3</td>
</tr>
<tr>
<td>History of contact or travelling to a country with confirmed cases of influenza A H1N1 infection</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
</tr>
</tbody>
</table>

Symptoms at presentation included cough, fever, dyspnea, diarrhea and seizure. The most common clinical manifestation was cough (n=51, 98%) and fever (n=36, 69%). Other symptoms included were diarrhea, dyspnea, and seizure. (Figure 1). From routine blood count, 41 (78.8%) showed leukocyte count in the range of 4,000-12,000/cm3 only 9.5% children revealed leukopeni. Most of the patients have normal thrombocyte count, 15(29%) patients have thrombocytopenia. Most of the patients (n= 34,65%) showed lymphopenia. (Figure 2). From chest radiograph findings, most of children (n=34,65%) have normal chest x-ray, 18 patients (35%) have abnormal findings, with the most common was patchy infiltrates. (Figure 3)

Thirteen children (27%) had underlying disease, and 10.6% of them were immunocompromised. Four patients (8.5%) transferred to ICU for ventilator support and two of them died due to respiratory failure.

DISCUSSION

We report 52 cases of hospitalized children with influenza A (H1N1) virus infection during 3 months of the pandemic in Surabaya. The clinical features of patients who were hospitalized with influenza A
(H1N1) were generally similar to those reported during peak periods of seasonal influenza and past pandemics with an acute onset of respiratory illness (Nicholson 1992; Cox, 1999; Moore, 2006). Whereas diarrhea and vomiting have occasionally been reported in children, these symptoms were reported in 1 patient. The clinical diagnostic criteria may have similar diagnostic accuracy to that provided by the current rapid diagnostic tests. The criteria for the clinical diagnosis of influenza consists of a fever greater than 38°C plus two or more URI symptoms (cough, sore throat, nasal symptoms, myalgia, headache, malaise) (Schrag SJ, 2006). The two most common symptoms of cough (98%) and fever (69%) in our patients was not different from the WHO, CDC reports, study by Park SI. Study by Park SI also showed both of the median and average age of the patients who admitted in single medical institution were 7.0 years (Park SI, 2010). In our study, most of the patients were 10-15 year old age. The proportion of children who had an underlying condition (27%) was smaller than proportions that have been reported for children who were hospitalized with influenza A (H1N1) in the United State (60%) (Jain S, 2009).

In our study, most of the patients (n= 34,65%) showed lymphopenia. Previously, relative lymphopenia has been found to be an early and reliable laboratory finding of adult influenza A (Cunha BA, 2008; Mohan SS, 2004, Tumpey, 2005). Like human seasonal influenza A, relative lymphopenia appears to be a laboratory marker of H1N1. In adults with positive test results for H1N1, relative lymphopenia with or without thrombocytopenia was common, but leukopenia was not present. But study by Cunha, in children with influenza A, relative lymphopenia was uncommon (in 3 of 16 children). In adults who test positive for influenza A by the rapid influenza test, relative lymphopenia appears to be a marker to identify those likely to have H1N1 and thus to merit specific RT-PCR testing (Cunha BA, 2008).

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Figure 1. Symptoms distribution of patients with confirmed H1N1 at Department of Child Health, Dr. Soetomo Hospital, from July until September 2009

Figure 2. Laboratory findings of patients with confirmed influenza A (H1N1) at Department of Child Health, Dr. Soetomo Hospital, from July until September 2009

Figure 3. Radiological findings of patients with confirmed H1N1 at Department of Child Health, Dr. Soetomo Hospital, from July until September 2009

In our study, 35% of hospitalized patients had findings on chest radiography that were consistent with pneumonia, and the majority had patchy infiltrates. Although it is difficult to precisely determine the cause of pneumonia from radiographs, during the 1957–1958 influenza pandemic, Louria et al (cited from Jain S, 2009) reported findings of diffuse bilateral infiltrates in
patients with primary influenza viral pneumonia, whereas lobar infiltrates were seen in patients with secondary bacterial infections. Better studies are needed to correlate radiographic findings with the cause of pneumonia during influenza outbreaks. In our study, all of patients with radiographic evidence of pneumonia received antiviral drugs and antibiotics. In the absence of accurate diagnostic methods, patients who are hospitalized with suspected influenza and lung infiltrates on chest radiography should be considered for treatment with both antibiotics and antiviral drugs.

Several rapid antigen and immunofluorescent antibody tests are available for the diagnosis of influenza virus infection. The sensitivity of these tests varies widely, and although some assays are able to distinguish between influenza A and B viruses, they are not able to distinguish between pandemic and seasonal strains of H1N1 influenza A. However, the specificity of these rapid antigen tests seems to be much higher compared to its sensitivity. Confirmation can be made only by rt RT-PCR or culture. Viral culture is too slow to help guide management, and a negative viral culture does not exclude pandemic H1N1 influenza A infection. Confirmation diagnosis in our study was made by positive result rt RT-PCR H1N1. Although the patients treated by our hospital mostly presented mild manifestations and short disease course without severe complications or mortality, Four patients (8.5%) transferred to ICU for ventilator support and two of them died due to respiratory failure.

CONCLUSION

In our study showed the most common clinical symptoms of swine influenza was cough and fever, with history of contact. There were unspecified laboratorical findings, with most of the chest radiograph revealed pneumonia. Mortality rate of children with respiratory failure was high.

REFERENCES