Respiratory Syncytial Virus Infection in Adults Hospitalized with Influenza like Illness in France

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Introduction

Respiratory syncytial virus (RSV) is an increasingly recognized cause of respiratory tract infection in adults. Few studies have evaluated RSV infection burden in adults. The aim of this study was to analyze characteristics and outcomes of RSV infection in adults hospitalized with influenza-like illness (ILI).

Methods

Patients hospitalized with ILI who tested positive for RSV, influenza virus, or any respiratory virus were included in a prospective multicenter study (FLUVAC, clinicaltrials.gov NCT02027233) carried out in six French hospitals during three consecutive influenza seasons (2012-2015). RSV and other respiratory viruses were detected by reverse-transcriptase polymerase chain reaction in nose/throat swabs and/or bronchoalveolar lavage fluid or tracheal aspirates. Risk factors for RSV infection were identified by backward stepwise logistic regression analysis.

Results

Fifty-nine cases of RSV infection in adults were identified by backward stepwise logistic regression and/or bronchoalveolar lavage fluid or tracheal polymerase chain reaction in nose/throat swabs viruses were detected by reverse-transcriptase polymerase chain reaction. RSV was the third most frequent virus, after influenza virus and parainfluenza virus (n=566, 39% of patients with ILI, 73% of patients with at least one virus) and picornavirus (n=68, 5% of patients with ILI, 9% of patients with at least one virus). Other detected viruses were coronaviruses (n=51, 3.5% and 7% respectively), human metapneumovirus (n=41, 3% and 5%), adenovirus (n=18, 1% and 2%) and bocavirus (n=8, 0.5% and 1%). Six patients were diagnosed with both influenza virus and RSV infection and were thus removed from further analyses.

The median age of the 53 patients with RSV infection alone was 74 years (IQR, 61-84). Chronic underlying diseases were present in 45 cases (85%), and consisted mainly of chronic respiratory diseases (n=29, 55%), chronic heart disease (n=24, 45%) and cancer (n=18, 34%); 12 solid tumors, 6 hematological malignancies.

Fifteen patients (28%) were on immunosuppressive therapy. Twenty-six patients (49%) had been hospitalized in the previous year, an average of 1.4 times (SD 2.3).

Table 1. Number and Percentage of Patients Hospitalized with ILI who Tested Positive for RSV, Influenza Virus, or any Respiratory Virus

<table>
<thead>
<tr>
<th>Season</th>
<th>ILI</th>
<th>RSV</th>
<th>Influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012/2013</td>
<td>226 (50%)</td>
<td>21 (5)</td>
<td>162 (36)</td>
</tr>
<tr>
<td>2013/2014</td>
<td>188 (46)</td>
<td>13 (3)</td>
<td>112 (28)</td>
</tr>
<tr>
<td>2014/2015</td>
<td>163 (41)</td>
<td>25 (4)</td>
<td>292 (49)</td>
</tr>
<tr>
<td>Total</td>
<td>577 (40)</td>
<td>59 (4)</td>
<td>566 (39)</td>
</tr>
</tbody>
</table>

Conclusion

RSV was the third most common respiratory virus, being detected in 4% of patients, as compared to 39% for influenza virus. We found that the two underlying conditions independently associated with RSV infection were cancer and immunosuppressive treatment. Although immunocompromised patients (especially patients with hematological malignancies) are known to be more susceptible to RSV infection, solid cancers and immunosuppressive therapy are not classical risk factors. RSV was associated with significant morbidity. These findings are consistent with the literature.

The strengths of this study include the large number of adults hospitalized with ILI, the prospective multicenter design, standardized patient screening in the participating centers, centralized confirmation of the participating centers, and the lengthy study period spanning three consecutive influenza seasons.

Potential benefits of enhanced RSV testing, antiviral treatment, and vaccine development in these groups should be considered.

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