Do Corticosteroids Benefit Patients With Influenza Pneumonia?

TAKE-HOME MESSAGE
Among patients with influenza pneumonia, corticosteroids are associated with increased mortality, longer length of stay in the ICU, and higher rates of secondary infection, although there are no data from randomized trials.

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Results
Comparison of corticosteroids with control for influenza pneumonia.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No. of Studies (No. of Participants)</th>
<th>RR (95% CI)</th>
<th>MD (95% CI)</th>
<th>Heterogeneity (I², %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>10 (6,548)</td>
<td>1.75 (1.30 to 2.36)</td>
<td></td>
<td>84</td>
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<tr>
<td>Rate of secondary infection</td>
<td>5 (4,522)</td>
<td>1.98 (1.04 to 3.78)</td>
<td></td>
<td>94</td>
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<tr>
<td>ICU length of stay</td>
<td>2 (2,054)</td>
<td>2.14 (1.17 to 3.10)</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>MV days</td>
<td>3 (2,426)</td>
<td>0.81 (−1.23 to 2.84)</td>
<td></td>
<td>53</td>
</tr>
</tbody>
</table>

RR, Relative risk; CI, confidence interval; MD, mean difference; MV, mechanical ventilation

The search strategy identified 10 trials (n=6,548 patients) meeting inclusion criteria. From these, a total of 2,564 patients received corticosteroids, whereas 3,984 did not. Eight studies (n=4,414 patients) included only patients with influenza type A H1N1, one study (n=288 patients) included only influenza type A H7N9, and one study (n=1,846 patients) included patients with influenza type A, B, or C. The mean age of participants in the included studies ranged from 33 to 53 years, and 41% to 69% of patients were men. There were 5 retrospective and 5 prospective studies.

Overall, the use of corticosteroids was associated with increased mortality, a higher rate of secondary infection, and a longer ICU length of stay (Table). All studies were determined to be high quality (defined as a Newcastle-Ottawa

This review found that corticosteroid use was associated with worse outcomes (defined as mortality, rate of secondary infection, and ICU length of stay) compared with no corticosteroid use, suggesting it may be harmful in patients with influenza pneumonia. The worse outcomes in the corticosteroid group may be due to immunosuppression resulting in prolonged viremia, increased rates of secondary infections (including bacterial pneumonia), or corticosteroid-related adverse effects (e.g., hyperglycemia, fluid retention, dysrhythmias). This study did not specifically assess this among patients with chronic respiratory disorders (e.g., asthma, chronic obstructive pulmonary disease), so steroids should still be given, if appropriate, according to patients’ underlying respiratory disorder.

However, it is important to consider several limitations with respect to the current study. First, there was significant clinical heterogeneity in the study populations in regard to age, comorbidities, and acuity of illness. Additionally, there were differences in the steroid type, dose, and duration between studies, and most studies did not describe some or all of these factors. Moreover, most studies assessed only the H1N1 strain, whereas only one study assessed multiple strains of influenza. However, the findings from this latter study were consistent with the overall findings. Many of the studies were retrospective and there were no randomized controlled trials in the review, so it is possible that there were uncontrolled confounders that influenced the results. Specifically, it is possible that sicker patients received corticosteroids, which may have led to the worse outcomes in this group. Finally, there were limited data on the rates of antiviral use. Because all of the patients who improved with steroids in community-acquired pneumonia also received antibiotics, it is unclear whether lack of antiviral therapy influenced these results.