Clinical Pharmacist Interventions Associated with Appropriateness and Length of Inpatient Antimicrobial Therapy for Pneumonia

Dear Editor:

Inappropriate use of antibiotics in the management of pneumonia can lead to the emergence of bacterial resistance and higher costs. The impact of pharmaceutical care for patients with pneumonia is unknown. We conducted a prospective historically controlled study to evaluate the impact of inpatient pharmaceutical care on the use of antibiotics for hospital and community-acquired pneumonia at Hôpital du Sacré-Coeur de Montréal, a tertiary-care teaching hospital affiliated with the University of Montreal. The main endpoint of the study was to compare the mean duration of intravenous antibiotic therapy between a group of inpatients receiving pharmaceutical care (intervention group, data collected prospectively from January 1, 2000, to April 7, 2000) and an historical control group that did not receive pharmaceutical care (retrospective chart review for patients hospitalized between January 1, 1998, and May 30, 1998). We also estimated the proportion of antibiotic treatments that were inappropriate in the control group, based on preestablished criteria.

A total of 101 patients were included in the study: 43 in the intervention group and 58 in the control group. Patient characteristics were similar between the groups. Mean age was 71.9 in the intervention group and 74.1 in the control group, and the mean pneumonia severity index, as described by Fine, was 110 and 109.3 points, respectively. Mean length of intravenous antibiotic therapy was 2.3 days shorter in the intervention group (4.4±2.5 days) compared to the control group (6.7±3.7 days; \( P=0.0004 \)). This represents a 34% reduction, which is superior to the one-day reduction reported by Bailey et al.\(^2\). Mean duration of antibiotic therapy during hospitalization was also reduced in the intervention group (8.8±2.8 days) compared to the control group (10.3±4.2 days; \( P=0.04 \)). The antibiotic most frequently prescribed was cefuroxime (93%). In the intervention group, pharmacists suggested a switch from intravenous to oral therapy in 46% of cases, a reduction in the dosage or frequency of administration of the antibiotic in 21% of cases, and discontinuation of an antibiotic in 21% of cases. All these recommendations were accepted by the medical team (i.e., treatment modified exactly or partially compared to what the pharmacist suggested). Overall, 33% of the prescriptions were considered inappropriate in the control group (Table 1). Some patients had more than one inappropriate criterion, which explains why we present a cumulative percentage in the table. This study did not demonstrate a significant reduction in acquisition costs of antibiotic therapy ($98.9 versus $107.8 in the intervention and control group; \( P=0.6 \)), which could be explained by the increased use of cefotaxime in the intervention group.

The main limitations of our study are that clinical outcomes and length of stay were not evaluated. The positive impact of pharmacists on the duration of hospitalization in patients with various infections has been reported by Przylbski\(^3\) (1.5 days), and Gums\(^4\) (3.3 days). Our study brings complementary information on the role and impact of pharmacists on antimicrobial therapy, and the results support the conduct of a study where clinical outcomes and total health care costs would be evaluated.

REFERENCES


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EDITOR’S NOTE: Clinical quality improvement results from pharmacist interventions in patient care throughout the continuum of inpatient and outpatient care. Managed care pharmacy makes systematic the clinical pharmacist interventions that produce measurable improvement in patient outcomes.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>% of patients</th>
<th>Cumulative (%)</th>
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<tbody>
<tr>
<td>Dosage unadjusted according to renal function</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Dosage unadjusted according to serum concentration results (aminoglycosides and vancomycin)</td>
<td>5</td>
<td>19</td>
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<tr>
<td>Alternative with a narrow spectrum of activity and at a lower cost available</td>
<td>7</td>
<td>24</td>
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<tr>
<td>Duplication of therapy (based on mechanism of action, spectrum of activity or severity)</td>
<td>13</td>
<td>26</td>
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<tr>
<td>Antibiotherapy not in accordance with clinical practice guidelines$^1$</td>
<td>9</td>
<td>33</td>
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*LETTERS*

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