Clinical and economic impact of pharmacists’ interventions related to antimicrobials in the hospital setting: A systematic review

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Objective

Summarize evidence regarding clinical and/or economic impact of Pharmacists’ Interventions (PI) related to antimicrobials in the hospital setting, in order to identify those to prioritize.

Methods

Search:
- PubMed + references in citations
- From Jan-2003 to Mar-2016
- Searching terms: pharmacist* or clinical pharmacist* and antimicrobial* or antibiotic* or anti infective*

Table 1. Inclusion and exclusion criteria for study selection

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Comparative</td>
</tr>
<tr>
<td>Language</td>
<td>English, Spanish or French</td>
</tr>
<tr>
<td>Population</td>
<td>Adults</td>
</tr>
<tr>
<td>Setting</td>
<td>Hospital or emergencies</td>
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<tr>
<td>Intervention</td>
<td>PI only in antimicrobials</td>
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<tr>
<td>Comparison</td>
<td>With PI vs. without PI</td>
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<tr>
<td>Outcomes</td>
<td>Economical and/or clinical</td>
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</tbody>
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Exclusion criteria:
- Non-comparative, reviews
- Solely pediatric or cystic fibrosis
- Community or primary care
- Multidisciplinary team interventions
- Generalist vs. Infectious pharmacist

Data collected from each selected paper:
- Author, year, country
- Patients’ characteristics
- Outcomes and type of outcome
- PI and type of PI (SR= specific recommendations for specific patients, Policy= establishment of treatment policies, Education= sessions or education to health professionals)

Risk of bias of studies was assessed using Cochrane Collaboration’s tool.

Results

Characteristics of studies
- 74% Published after 2010
- 17% European, 39% American
- 13% Multicenter
- 56% Focused on specific ward
- 100% With high risk of bias

Uncontrolled before-after study 61%
Controlled before-after study 22%
Observational study 9%
Randomized controlled trial 4%
Controlled trial 4%

Figure 1. Flow diagram

Pharmacist Interventions:
- Related to a specific patient
- Integrated in the health team
- Participating in rounds
- Incorporating guidelines, protocols, and education

Improved clinical outcomes
- Decreased:
  - Post-operative infections
  - Antimicrobial adverse effects
  - Length of stay
  - Unplanned readmissions
  - Mortality

Cost:Benefit (in 2 studies): 11-19 € saved per 1€ invested
No study found negative impact.
70-92% accepted recommendations
Can’t conclude that adding other type of strategies to SR would improve results.

Figure 2. Study designs

Figure 3. Type of PI analyzed in studies

Figure 4. Studies that evaluate each outcome and those with significant impact of PI

Conclusions

- Pharmacists’ interventions regarding antimicrobials have a positive impact on treatment related and clinical outcomes, and decrease hospital expenditures.
- Pharmacist in the health team giving advice related to specific patients has impact on key clinical outcomes.

Limitations: poor quality studies.