IMPACT OF DIFFERENT LEVELS OF CLINICAL PHARMACIST INTERVENTIONS ON THERAPEUTIC PLAN AND COST SAVING

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I. IMPACT OF DIFFERENT LEVELS OF CLINICAL PHARMACIST INTERVENTIONS ON THERAPEUTIC PLAN AND COST SAVING

II. OUTLINE

- Background
- Objective
- Study setting
- Method
  - Study Design
  - Data Collection
- Limitation
- Conclusion

III. BACKGROUND

- A number of studies have demonstrated the clinical and economic benefits of clinical pharmacy interventions (CPI) in hospital and primary care settings (Kopp BJ et al. 2007, Bond CA et al. 2007, Haumschild MJ et al. 2003, Finley PR et al. 2005).

- These studies focused on the number or type of CPI without mentioning the level of CPI and number of clinical pharmacists (CP) who are involved in CPI. Also most of thse studies without control group (No-CPI).

IV. STUDY AIM AND OBJECTIVE

- **Aim**
  Since there is shortage of clinical pharmacist (CP), we decide to answer: Is there any difference (either clinical or economical) between different levels of CPI on therapeutic plan and cost saving through monitoring and follow-up of some and the same medications? (including 20% Human Albumin, Meropenem and Cefepime) over three separated months.

- **Objective**
  To assess the impact of partial and effective CPI on therapeutic plan and cost saving.

V. STUDY SETTING

The study conducted in medical, surgical and trauma ICU of secondary care hospital with 21 beds, 3 intensives, 10 physicians and one clinical pharmacist.

VI. STUDY DESIGN

Prospective observational study

- Three CPI levels were done by CP
  - No CPI (control group)
  - Partial CPI (POPI)
  - Effective CPI (ECPI)

- Intervention were made by CP through:
  - (In-Patient pharmacy)
  - Reviewing patient drug profile
  - Reviewing physician order
  - Contacting treating physician (Intensives) directly or indirectly (writing pharmacist note or informing the resident doctors or nurses)

- No CPI (control group)
  - Master degree in clinical pharmacy attached with 1500 hours clerkship and
  - Two years experience in CP practice
  - He spent around 4-5 hours daily in the ICU ward

- Partial CPI (POPI)
  - Master degree in clinical pharmacy attached with 1500 hours clerkship and
  - Two years experience in CP practice

- Effective CPI (ECPI)
  - Direct contact with treating physician through daily round with ICU team
  - Supported by Evidence-Based Medicine
  - Follow-up for physician order
  - Assessment for patient improvement through follow-up
DATA COLLECTION
- The number of dispensed vials for each item (Human Albumin 20%, 50ml, Meropenem 500mg, Cefepime 2 gm) was recorded by clinical pharmacist from both:
  1. Patient medical record
  2. Patient drug profile
- The data collected during morning shift only.

DATA ANALYSIS
- Nominal variables were used
- Frequency and percentage analysis were applied

RESULTS: HUMAN ALBUMIN 20%, 50 ML
- The percentage of quantity saved of Human Albumin was 47% PCPI and 77% in ECPI.
- ECPI resulted in more increment in cost saving in comparison to PCPI (39.4%).

<table>
<thead>
<tr>
<th>Month</th>
<th>Level of CPI</th>
<th>Dispensed/Cost (Unit price 57.4 $)</th>
<th>Saved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>No-CPI (Control group)</td>
<td>660 vials (42456 $)</td>
<td>None</td>
</tr>
<tr>
<td>August</td>
<td>Partial CPI</td>
<td>460 vials (29408 $)</td>
<td>40% (67%)</td>
</tr>
<tr>
<td>September</td>
<td>Effective CPI</td>
<td>200 vials (11460 $)</td>
<td>68% (77%)</td>
</tr>
</tbody>
</table>

Total cost saved for two months through PCPI and ECPI = 60844 $

RESULTS: MEROPENEM 500 MG INJECTION
- 48% of the dispensed quantity was saved by PCPI and 91% by ECPI.
- ECPI resulted in more increment in cost saving in comparison to PCPI (47.4%).

<table>
<thead>
<tr>
<th>Month</th>
<th>Level of CPI</th>
<th>Dispensed/Cost (Unit price 21.5 $)</th>
<th>Saved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>No-CPI (Control group)</td>
<td>1070 vials (23005 $)</td>
<td>None</td>
</tr>
<tr>
<td>August</td>
<td>Partial CPI</td>
<td>560 vials (12040 $)</td>
<td>510 (48%)</td>
</tr>
<tr>
<td>September</td>
<td>Effective CPI</td>
<td>101 vials (2171.5 $)</td>
<td>312 (31%)</td>
</tr>
</tbody>
</table>

Total cost saved 31798.5 $

PRESENTATION: CEFEPIME 2 GM INJECTION
- PCPI saved more than ECPI.
- It might be due to:
  - Shortage of 3rd Cephalosporin's and Pipradro
  - Recommendation by CP according to the antibogram

<table>
<thead>
<tr>
<th>Month</th>
<th>Level of CPI</th>
<th>Dispensed/Cost (Unit price 17 $)</th>
<th>Saved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>No-CPI (Control group)</td>
<td>460 vials (6100 $)</td>
<td>None</td>
</tr>
<tr>
<td>August</td>
<td>Partial CPI</td>
<td>350 vials (6120 $)</td>
<td>120 (25%)</td>
</tr>
<tr>
<td>September</td>
<td>Effective CPI</td>
<td>456 vials (7786 $)</td>
<td>374 $</td>
</tr>
</tbody>
</table>

Total cost saved 24147 $

RESULTS: CEFEPIME 2 GM INJECTION (continue)

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Total cost saved 24147 $

THE COST SAVING FOR THREE ITEMS AFTER DIFFERENT LEVELS OF CPI
- Total cost through NO-CPI/month for three items = 80,529 $
- Total cost saving through PCPI/month for three items = 35,365 $ (45%)
- Total cost saving through ECPI/month for three items = 59,091 $ (73%) with incremental cost saving 39% in comparison to PCPI

Net cost saving through ECPI/month for three items = 54,091 $
- What about if it is extrapolated to net cost saving/year?
**THE IMPACT ON THERAPEUTIC PLAN**

- Reduce overuse and/or abuse of very broad spectrum antibiotics (e.g. Meropenem), also highly cost item (e.g. H. Albumin 20%)
- Up to 73% of monthly cost saved through ECPI without compromising the clinical outcomes
- Participating of clinical pharmacist effectively in daily round with the treating physicians using EBM support and follow-up of patient improvement can lead to a substantial **net-cost saving** of therapeutic plan.

**LIMITATIONS**

1) Single center and only in ICU
2) The study conducted on three items and focus on drug cost and patient improvement
3) The study period was short
4) No outcomes assessment

**CONCLUSION**

- CPI generally results in cost saving of therapeutic plan
- ECPI can lead to more remarkable net-cost saving than PCPI

**Take Home Message**

Encourage participating of clinical pharmacist effectively in daily round with the treating physicians using EBM support through CPI

**Thank You**