Self-administered home parenteral antibiotic treatment using elastomeric infusion pumps in orthopaedic patients

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Background
- Orthopaedic patients with infections in bones and joints
- Long term IV antibiotic treatment at hospital
- Difficult to maintain the patient’s social and physical skills

Purpose
- To study if elastomeric infusion pumps reduce hospitalization of orthopaedic patients with osteomyelitis and septic arthritis
- To evaluate if patients prefer home therapy over hospitalization

Materials and methods
- Drug stability of dicloxacillin and piperacillin/tazobactam was studied to ensure sufficient expiry dates
- The hospital pharmacy delivered dicloxacillin and piperacillin/tazobactam dispensed in portable elastomeric pumps from Baxter®
- 12 patients were included due to osteomyelitis (n=9), septic arthritis (n=2) or both osteomyelitis and septic arthritis (n=1)
- Patients or parents were trained to self-administer while waiting for the cultivation report
- Patients were discharged with a central venous catheter, portable pumps and a written instruction
- Patients returned to hospital for new pumps depending on expiry date of drug

Results

Drug stability studies

<table>
<thead>
<tr>
<th>Drug and dose</th>
<th>Diluent</th>
<th>Volume</th>
<th>Elastomeric pump</th>
<th>Stability 2-8°C</th>
<th>Stability 32°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicloxacillin 2 g three times a day</td>
<td>NS</td>
<td>200 ml</td>
<td>Intermediate 250ml/hour</td>
<td>7 days</td>
<td>+1 hour</td>
</tr>
<tr>
<td>Piperacillin/tazobactam 12 g contin/24 hours</td>
<td>NS</td>
<td>240 ml</td>
<td>Infusor 10ml/hour</td>
<td>7 days</td>
<td>+1 day</td>
</tr>
</tbody>
</table>

Reduction of in-hospital stay

- IV antibiotic treatment total: 193 days
- IV antibiotic treatment at home: 133 days
- Reduction of in-hospital stay: 69%

Patients who succeeded treatment at home
11 of 12 patients succeeded treatment at home. One patient developed allergic erythema. The patients and parents felt secure and satisfied with self-administration and preferred treatment at home over hospitalization.

Conclusion
- Sufficient drug stability of portable elastomeric pumps increases the patient’s possibility to self-administer at home
- Self-administration of parenteral antibiotics at home reduced in-hospital stay by 69% for this group of patients
- The patients and parents preferred home therapy over hospitalization

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