Exploring appropriate utilisation of ambulatory care for pyelonephritis

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Background
Pyelonephritis is an infection involving the renal pelvis and paraenchyma. Current national guidance advises clinicians to send a mid-stream urine (MSU) sample before antimicrobials are started, which antimicrobial to use, duration of treatment course and admission criteria.

Aims
• To evaluate clinical practice and adherence to established protocols in the diagnosis and treatment of pyelonephritis
• To evaluate the efficacy of ambulatory care in treating these patients as a safe and cost-effective alternative to hospital admission

Method
A retrospective single centre observational study was undertaken, identifying patients with pyelonephritis who attended ambulatory care at a central London teaching hospital between May-July 2017 inclusively. Clinical and laboratory data were analysed.

Demographics
• Total 58 patients, aged 16-89 years (mean 45.2years), 82.8% female
• Patients were referred to ambulatory care from: ED (48%), AAU (36%), UCC (7%), another ward (5%), GP (2%) or directly from outpatients (2%).

Pathology

<table>
<thead>
<tr>
<th>Number of samples</th>
<th>MSU Culture Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CRO</td>
</tr>
<tr>
<td>Sample not sent</td>
<td>3</td>
</tr>
<tr>
<td>E. Coli not clinically useful</td>
<td>16</td>
</tr>
<tr>
<td>Not clinically useful</td>
<td>4</td>
</tr>
<tr>
<td>Coliforms</td>
<td>26 positive culture</td>
</tr>
<tr>
<td>Citrobacter brakii</td>
<td>21 not clinically useful</td>
</tr>
</tbody>
</table>

Not clinically useful: no growth/mixed bacterial growth/enterococcus spp.

Results

Imaging
• 22/58 patients had imaging during the course of their treatment, the majority (15) having USS KUB. Imaging results of these 22 patients are shown below:

Antibiotic Use
• 74% of patients were given appropriate antimicrobials according to either local guidelines or to organism sensitivities.
• Mean antimicrobial duration was 12.3 days, mode was 10 days.

Ambulatory Care vs. Hospital Admission
• 57% patients were not admitted to hospital, but managed in ambulatory care alone. Total of 93 inpatient bed days.
• Length of inpatient stay ranged from 0-13 days, mean 1.6 days.
• 11 patients stayed in hospital >2 days due to more complicated disease course.
• 76% patients received IV antimicrobials in ambulatory care.
• Mean IV duration in ambulatory care was 3.8 days.
• Total no. of days ambulatory care administered antimicrobials was 218 days.
• 3/58 patients re-presented within 31 days of discharge from ambulatory care due to i) non-compliance, ii) complication with renal calculi and iii) recurrent ESBL infection.
• Mortality was zero. Antimicrobial adverse effects were zero. Intravenous access adverse events were zero. Zero cases of Clostridium difficile.

Conclusions
• Pyelonephritis can be safely managed in an ambulatory care setting, saving high numbers of bed days.
• To optimise MSU utility, these must be sent prior to first dose of antimicrobials.
• Variation in antimicrobial duration for pyelonephritis should be standardised, but whether at 14 or 10 days to minimise treatment failure remains unclear.

References
1. NS Sheerin. Urinary Tract Infection. Medicine, 2015; 43: (435-439)

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