Content

- Background and objective
- Design study
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- Conclusion
Background and objective

- Literature data shows that hospitalized patients with a reduced kidney function are frequently treated with inappropriate antibiotic dosages
  - Overdosage ----- serious adverse reactions
  - Underdosage ---- failure of treatment ---- resistance development

- Initiative by the local Antibiotic Policy Group to evaluate the local practice

- Protocol approval by local ethical committee
Retrospective observational study: design

**Inclusion criteria**
- > 18 years
- admission on internal medicine, abdominal surgery or nephrology (period April 2006 – March 2007)
- estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73m²

**Exclusion criteria**
- dialysis patients
- kidney transplant patients
- patients < 18 years
Retrospective observational study: design

**Inclusion criteria**

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**Exclusion criteria**

- dialysis patients
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**Formula for measuring kidney function**

- eGFR with MDRD-formula (Modification of diet in renal disease)
  - serum creatinine, age, sex
- creatinin clearance with Cockroft & Gault formula
  - serumcreatinine, age, sex and weight

**Datacollection**

- trainee pharmacist under supervision of a hospital pharmacist and an infectiologist
Retrospective observational study: design

- Evaluation of antibiotic dosage
  - evaluation panel: infectiologist, intensive care physician, pharmacist
  - administered dosages in relation to the creatinine clearance
    - dose adaptations were based on the recommendations of “The Belgian edition of the Sanford Guide for Antimicrobial Therapy”
    - antibiotic dosages for which therapeutic monitoring is necessary were evaluated based on plasma concentrations
Results

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of treatments</td>
<td>99</td>
</tr>
<tr>
<td>Sex male/female</td>
<td>46/53</td>
</tr>
<tr>
<td>Number of treatments</td>
<td></td>
</tr>
<tr>
<td>Nephrology</td>
<td>27</td>
</tr>
<tr>
<td>General medicine</td>
<td>21</td>
</tr>
<tr>
<td>Abdominal surgery</td>
<td>51</td>
</tr>
<tr>
<td>Mean age (SD)</td>
<td>64.5 (15.3)</td>
</tr>
<tr>
<td>Number dosages administered</td>
<td>1,364</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Number administered dosages</th>
<th>Number correct dosages (%)</th>
<th>Number incorrect dosages (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.364</td>
<td>1.068 (78.3)</td>
<td>296 (21.7)</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Number dosages without data (%)</th>
<th>Number dosages overdosed (%)</th>
<th>Number dosages underdosed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>39 (13.2)</td>
<td>183 (61.8)</td>
<td>74 (25)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number administered dosages</th>
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<tr>
<td>1.364</td>
<td>1.068 (78.3)</td>
<td>296 (21.7)</td>
</tr>
</tbody>
</table>
## Discussion:
### Results of similar studies

<table>
<thead>
<tr>
<th>Number of inappropriate antibiotic dosages in renal failure patients</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>33%</td>
<td>Falconnier A et al. J Gen Intern Med 2001;16:369-375</td>
</tr>
<tr>
<td>36%</td>
<td>Evans R et al. The Annals of Pharmacotherapy 1999;33: 1026-1031</td>
</tr>
<tr>
<td>77%</td>
<td>Veen G et al. Pharmaceutisch Weekblad 2001;29:1048-54</td>
</tr>
</tbody>
</table>
Discussion:
Instruments for optimising prescribing for patients with a reduced kidney function?

- Promoting guidelines (passive, active)

  - Online alert
  - Alert by email or SMS

- Antibiotic Policy Groups
  - Clinical pharmacists (Olson L Can J Hosp Pharm 2005;58:20-5)
Discussion:
Instruments for optimising prescribing in renal failure in the Ghent University hospitals?

Improvements

Alert is presented when physicians or clinical pharmacists are consulting the electronic laboratory results

- The pop-up "Your patient has a possibly reduced kidney function. Take care when prescribing medication." appears when an algorithm found an eGFR below 60 ml/min/1.73m² for patients between 18 and 70 years.

Letter to all physicians

Task for clinical pharmacist
Conclusion

- One fifth of the patients received an inappropriate antibiotic dosage according the kidney function.

- An electronic alert was installed to improve the awareness.
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