ANTIBIOTIC ALLERGY AND BROAD-SPECTRUM ANTIBIOTICS

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Background

- A reported antibiotic allergy often leads to prescription of broader-spectrum antibiotics
  - Often not as efficacious
  - Increased length of stay and cost
  - Increased *Clostridium difficile*
  - Increased acquisition of resistant bacteria

- Antibiotic allergy frequently over-reported

Aims

• Examine the frequency of reported antibiotic allergy/AE at the Royal Hobart Hospital
• Examine the impact reported antibiotic allergy has upon the hospital’s use of broad-spectrum/restricted antibiotics
• Assess completeness and consistency of antibiotic allergy documentation
Method

• Approved by Tasmanian Human Research Ethics Committee
• Evaluated 2 groups over 6 month period:
  1. Adult admissions with a diagnosis of pneumonia
     • Proportion with reported history of antibiotic allergy (especially penicillin)
  2. Patients who received restricted antibiotics due to reported allergy to first line agent
     • Identified through hospital’s stewardship program
     • Compared to hospital’s overall use of restricted antibiotics
• All notes reviewed for:
  • Documentation of allergy (nature of reaction, time of reaction)
  • Details of management
  • Consistency of documentation
Antibiotic allergy is over-reported

Pneumonia admissions

- 72/424 (17%) reported an antibiotic AE
- 44/424 (10%) to penicilllin

- Previous studies estimate 5-10% of population report a penicillin allergy history.

- Other studies: 85% actually tolerate penicillins when challenged

Antibiotic allergy is over-reported

Pneumonia Cohort: Reported anaphylaxis to penicillin was very high

- 8/424 (2%) anaphylaxis/swelling of throat
- 7 (2%) ‘swelling’ or ‘angioedema’
  - Penicillin anaphylaxis estimated 1-4/10,000

**RHH rate 50-400X this!!!!**

Antibiotic allergy is over-reported

Pneumonia admissions

- 6/72 (8%) given antibiotic reported to be allergic →

None reacted!
Antibiotic allergy is over-reported

Patients prescribed restricted antibiotics

- 11 patients given antibiotic with reported allergy (one planned)
  - Only 1 reacted (itch following clindamycin)
Antibiotic allergy histories frequently incomplete

- In both cohorts, the nature of reaction frequently not documented:
  - Pneumonia cohort with penicillin allergy: 14/44 (32%)
  - Restricted antibiotic cohort: 11/84 (13%)

<table>
<thead>
<tr>
<th>Notes section</th>
<th>% Reaction documented</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED notes</td>
<td>38%</td>
</tr>
<tr>
<td>Admission notes</td>
<td>54%</td>
</tr>
<tr>
<td>Drug chart</td>
<td>72%</td>
</tr>
<tr>
<td>Discharge summary</td>
<td>73%</td>
</tr>
<tr>
<td>Alert (electronic records)</td>
<td>25%</td>
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</tbody>
</table>

Reaction documentation in different parts of the notes amongst patients prescribed restricted antibiotics.
Antibiotic allergy histories frequently incomplete

• In both cohorts, time of reaction almost never described:
  • Pneumonia cohort: 68/72 no time
    • 2/72 40-50 years ago, 1 recent
    • Other 1 reaction during admission
  • Restricted antibiotic cohort: 73/84 no time
    • 4/84 in childhood or >40 years ago
    • Other 7 reactions during admission
Antibiotic allergy histories often conflicting

- Pneumonia cohort: 18/72 (25%)
  - Which antibiotic: 14/18
  - Nature of reaction: 5/18
- Restricted antibiotic cohort: 14/84 (17%)
  - Which antibiotic: 11/14
  - Nature of reaction: 3/14
Tolerance not documented

• 16 patients tolerated antibiotic with reported allergy
  • Only once documented in discharge summary to GP
  • 13/16 (81%) patients still have an alert for allergy
Antibiotic allergy and use of restricted antibiotics

- Restricted antibiotics
  - 104 cases in 84 patients of prescription of restricted antibiotic
  - 80/84 (95%) patients reported penicillin allergy
  - 15 reported anaphylaxis to penicillin, 6 swelling or angioedema

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Patients</th>
<th>DDD/1000 PBD</th>
<th>Proportion of hospital’s use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin</td>
<td>17</td>
<td>3.5</td>
<td>15%</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>45</td>
<td>1.7</td>
<td>4%</td>
</tr>
<tr>
<td>Cefepime</td>
<td>6</td>
<td>3.0</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Fluoroquinolones</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>21</td>
<td>2.9</td>
<td>7%</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>11</td>
<td>1.6</td>
<td>44%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>32</td>
<td>4.5</td>
<td>9%</td>
</tr>
</tbody>
</table>

Restricted antibiotics used due reported antibiotics allergy or adverse event

DDD Defined daily dose (as defined by World Health Organisation)
PBD Patient bed days
What can be improved?

• Education and increase awareness
• A designated location and person for accurate allergy details
• Strategies for removing uncertainty
  • Careful history and chasing old notes
  • Skin testing, challenge
• De-labelling when antibiotic tolerated
  • Letter to patient
In summary

- Antibiotic allergy, particularly penicillin allergy is over-reported at RHH.
  - Especially anaphylaxis – 50-400X!
- Antibiotic allergy is often poorly documented, histories are incomplete. Uncertainty is common.
- Therefore too many restricted antibiotics are used.
- This likely leads to adverse outcomes including increased resistant bacteria, *Clostridium difficile*, cost, length of stay and poorer outcome.
- Health professional education, guidelines and a definitive location for information on antibiotic history may help.
Acknowledgements

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- Dr. Wun Lau
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