Community-Acquired Pneumonia: Severity scoring and compliance to BTS guidelines

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Plan

• Background
• BTS guidelines
• Differences in opinion
• Measures introduced
• Audit results
• Future plans
Background

• Unexpected increase in C. difficile rates in Prince Philip Hospital at the end of 2009
• Multidisciplinary meeting convened and action plan agreed
• Combination prescribing of broad-spectrum antibiotics for pneumonia needs to be targeted
  – Ensure severity scoring documented for all CAP patients
  – Co-amoxiclav to be used first line for severe infection
## BTS Guidelines for CAP

### Table 5  Initial empirical treatment regimens for community acquired pneumonia (CAP) in adults

<table>
<thead>
<tr>
<th>Pneumonia severity (based on clinical judgement supported by CURB65 score)</th>
<th>Treatment site</th>
<th>Preferred treatment</th>
<th>Alternative treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low severity</strong> (e.g. CURB65 = 0-1 or CRB65 score = 0, &lt;3% mortality)</td>
<td>Home</td>
<td>Amoxicillin 500 mg tabs orally</td>
<td>Doxycycline 200 mg loading dose then 100 mg od orally or clarithromycin 500 mg bd orally</td>
</tr>
<tr>
<td><strong>Low severity</strong> (e.g. CURB65 = 0-1, &lt;3% mortality but admission indicated for reasons other than pneumonia severity (e.g. social reasons/unstable comorbid illness))</td>
<td>Hospital</td>
<td>Amoxicillin 500 mg tabs orally OR If oral administration not possible: amoxicillin 600 mg tabs IV</td>
<td>Doxycycline 200 mg loading dose then 100 mg od orally or clarithromycin 500 mg bd orally</td>
</tr>
<tr>
<td><strong>Moderate severity</strong> (e.g. CURB65 = 2, 9% mortality)</td>
<td>Hospital</td>
<td>Amoxicillin 500 mg —1.0 g tabs orally plus clarithromycin 500 mg bd orally OR If oral administration not possible: amoxicillin 500 mg tabs IV or benzylpenicillin 1.2 g qds IV plus clarithromycin 500 mg bd IV</td>
<td>Doxycycline 200 mg loading dose then 100 mg od orally or levofloxacin 500 mg od orally or moxifloxacin 400 mg od orally</td>
</tr>
<tr>
<td><strong>High severity</strong> (e.g. CURB65 = 3-5, 15-40% mortality)</td>
<td>Hospital (consider critical care referral)</td>
<td>Antibiotics given as soon as possible OR amoxicillin 1.2 g tabs IV plus clarithromycin 500 mg bd IV OR If legionella strongly suspected, consider adding levofloxacin†</td>
<td>Benzylpenicillin 1.2 g qds IV plus either levofloxacin 500 mg bd IV or azithromycin 500 mg bd IV OR Ceftriaxone 1.5 g tabs IV or cefotaxime 1 g tabs IV or ceftazidime 2 g od IV, plus clarithromycin 500 mg bd IV OR If legionella strongly suspected, consider adding levofloxacin†</td>
</tr>
</tbody>
</table>

bd, twice daily; IV, intravenous; od, once daily; qds, four times daily; tabs, three times daily.

“Following reports of an increased risk of adverse hepatic reactions associated with oral moxifloxacin, in October 2003 the European Medicines Agency (EMA) recommended that moxifloxacin should be used only when it is considered inappropriate to use antibacterial agents that are commonly recommended for the initial treatment of this infection”.†Cautions — risk of QT prolongation with macrolide-quinolone combination.
Severity Scoring

• Summary of CURB65 score:
  – **Confusion**: New mental confusion, defined as an Abbreviated Mental Test score of eight or less.
  – **Urea**: Raised > 7 mmol/l
  – **Respiratory rate**: Raised ≥ 30/min
  – **Blood pressure**: Low blood pressure (systolic <90 mmHg and/or diastolic ≤ 60 mmHg)
  – **Age ≥ 65** years
Guideline Development

• Failure to reach agreement over treatment of CAP within Antimicrobial Management Committee

• Routine addition of macrolides for moderate infections as per BTS guidance
  • Only needed in mycoplasma epidemic period?
  • BTS quote 20% of all moderate infections caused by atypicals
  • Addition of macrolide if no response to amoxicillin or suspicion of atypicals
Respiratory Consultant Input

• All disagree with BTS recommendation of routine macrolides for moderate infection
  – Add if no response to initial antibiotics or if suspicion of atypicals

• Most also disagree with use of broad-spectrum antibiotics e.g. co-amoxiclav for severe infection
  – Recommend high dose amoxicillin or benzylpenicillin + macrolide
BSAC Council

• Letter published in JAC in October 2009

• Non-endorsement of the BTS recommendations for severe infections
  – Concern over agents recommended by BTS
    • Recommend benzylpenicillin + macrolide or doxycycline first-line
    • Co-amoxiclav reserved for pts with major co-morbidities at risk of severe Haemophilus infection

• Concern over sensitivity of CURB65 scoring
E-mail Survey of UK NHS Trusts

<table>
<thead>
<tr>
<th>First-line treatment regimen for severe CAP</th>
<th>Number of hospital trusts (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-amoxiclav + macrolide</td>
<td>41 (53%)</td>
</tr>
<tr>
<td>Benzylpenicillin + macrolide/doxycycline</td>
<td>19 (25%)</td>
</tr>
<tr>
<td>Amoxicillin + macrolide</td>
<td>8 (10%)</td>
</tr>
<tr>
<td>Cephalosporin + macrolide</td>
<td>5 (6%)</td>
</tr>
<tr>
<td>Piperacillin/tazobactam + macrolide</td>
<td>1</td>
</tr>
<tr>
<td>Benzylpenicillin + levofloxacin</td>
<td>1</td>
</tr>
<tr>
<td>Ertapenem + macrolide</td>
<td>1</td>
</tr>
<tr>
<td>Cephalosporin monotherapy</td>
<td>1</td>
</tr>
</tbody>
</table>

n=77 (approx 15% of UK NHS Trusts)
Hywel Dda Healthboard

• Decision made to follow BTS guidance
• Pilot of CURB65 prompt sticker
• Audit of severity scoring and compliance to BTS guidance
• Review recommendations with the results of the audit
  – Current treatment of severe pneumonia
Please place this sticker in the case notes of all patient's with a diagnosis of Community Acquired Pneumonia (CAP). Use to document the CURB65 score and guide treatment as per the BTS guidelines for CAP 2009. Inappropriate use of broad spectrum antibiotics can have consequences for the patient (e.g. C.difficile) and the wider community (e.g. emergence of Multi-Drug Resistant (MDR) organisms). The diagnosis of pneumonia must be confirmed by a chest x-ray.

**CURB65 severity score for CAP**

1 point for each feature present:
- Confusion (new-onset or worsening)
- Urea > 7mmol/l
- Respiratory rate ≥ 30/min
- Blood pressure (SBP < 90 or DBP ≤ 60 mmHg)
- Age ≥ 65 years

Pneumonia severity should be based on clinical judgement and supported by a CURB65 severity score. N.B. CURB65 score may be unreliable in young adults.

**CURB65 ≤ 1 Low severity**
- Amoxicillin (po) 500mg tds
- Foscarnet allergy:
- Doxycycline (po) 200mg stat, 100mg od OR
- Clarithromycin (po) 500mg bd
- Duration – 7 days

**CURB65 = 2 Moderate severity**
- Amoxicillin (po) 500mg-1g tds
- PLUS Clarithromycin (po) 300mg bd
- Pneumonia allergy: Doxycycline (po) 200mg stat, 100mg od
- Duration – 7 days

**CURB65 ≥ 3 High severity**
- Co-amoxiclav (iv) 1.2 g tds PLUS Clarithromycin (iv) 500mg bd
- Pneumonia allergy (non anaphylactic):
- Cefuroxime (iv) 1.5g tds PLUS Clarithromycin (iv) 500mg bd
- Duration 7-10 days

Beware Multi-Drug Resistant organisms. If risk factors present, discuss case with Microbiology

**CURB65 score=** __________ Signed ________________ Bleep/designation ________________ Date ________________
BTS GUIDELINES FOR COMMUNITY ACQUIRED PNEUMONIA (CAP)

CURB65 severity score for CAP

1 point for each feature present:
- Confusion (new-onset or worsening)
- Urea > 7mmol/l
- Respiratory rate ≥ 30/min
- Blood pressure (SBP < 90 or DBP < 60 mmHg)
- Age ≥ 65 years

Pneumonia severity should be based on clinical judgement and supported by a CURB65 severity score.
N.B. CURB65 score may be unreliable in young adults.

Diagnosis must be confirmed by Chest X-ray

CURB65 < 1 Low severity
CURB65 = 2 Moderate severity
CURB65 ≥ 3 High severity

Amoxicillin (po) 500mg tid
Piperacillin or Doxycycline (po) 200mg stat, 100mg od OR
Clarithromycin (po) 500mg bid
Duration - 7 days

Amoxicillin (po) 500mg tid or tds plus
Clarithromycin (po) 500mg bid
Piperacillin or Doxycycline (po) 200mg stat, 100mg od
Duration - 7 days

Co-amoxiclav (po) 1.2g tid PLUS
Clarithromycin (po) 500mg bid
Piperacillin allergy: (po) 500mg bid
Cefuroxime (po) 1.5g tid PLUS
Clarithromycin (po) 500mg bid
Duration 7-10 days

Beware Multi-Drug Resistant (MDR) organisms. If risk factors present, discuss case with Microbiology.

REMEMBER: Inappropriate use of broad-spectrum antibiotics can have consequences for the patient (e.g., Clostridium difficile) and the wider community (e.g., emergence of MDR organisms)
Audit Results

- Sample period: August – December 2010
- 32 patients in total
- Patients identified by ward pharmacists and audited by an antibiotic pharmacist
- Audit unable to take into account any clinical judgement used by the prescriber when deciding on a treatment regimen
Sample

• Inclusions
  – Patients with a documented diagnosis of CAP

• Exclusions
  – Aspiration pneumonia
  – Hospital-acquired pneumonia or recently (within 2 weeks) discharged from hospital
  – COPD/Asthma infective exacerbations
Results

- CURB65 score documented in 84% of patients (27/32)
  - Significant increase on previous audits
    - 12.5% (5/40) 2009-2010
    - 18% (2/11) 2008
- Prompt stickers not being used by Doctors
- Increase due to publicity surrounding the pilot of the CURB65 prompt stickers
  - Memo, posters, presentations
CURB65 Scores (n=32)

- CURB65 = 0: 16%
- CURB65 = 1: 9%
- CURB65 = 2: 31%
- CURB65 > 3: 31%
- Not documented: 13%
Treatment of CURB65 < 1 (n=7)

- Amoxicillin & clarithromycin: 42%
- Co-amoxiclav & clarithromycin: 29%
- Amoxicillin: 29%
Treatment of CURB65 = 2 (n=10)

- Amoxicillin & Clarithromycin: 20%
- Co-amoxiclav: 30%
- Co-amoxiclav & Clarithromycin: 10%
- Cefuroxime: 10%
- Cefuroxime & Clarithromycin: 10%
- Clarithromycin: 10%
Treatment of CURB65 > 3 (n=10)
Compliance to BTS guidelines

• 41% (11/27) were prescribed the recommended antibiotics (excluding route or dose)

• 18.5% (5/27) were prescribed the recommended antibiotic and the recommended route of administration
Feedback of Results

• Results circulated to all Respiratory Consultants within the Healthboard

• Feedback received reflected a lack of confidence in the sensitivity of CURB65 scoring:
  – Experience of low scoring patients requiring transfer to ITU
  – Interest in creating a local severity scoring system incorporating more features
Future Work

• Respiratory Consultant agreed to re-audit these patients to capture clinical judgement and patient outcomes

• Audit being repeated in another acute site within the Healthboard

• Repeat publicity surrounding severity scoring and compliance to guidelines prior to this Winter
References
