Use of CURB-65 scoring in Community Acquired Pneumonia

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Use of CURB-65 scoring in Community Acquired Pneumonia

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Keywords:
Community Acquired Pneumonia, CURB-65 scoring, clinical guidelines, audit, accident and emergency

Introduction
Over the past two decades, clinical guidelines have become increasingly widespread and have influenced many aspects of everyday practice. Potential benefits conferred by clinical guidelines include increased consistency and quality of care, increased quality of clinical decision, medico-legal protection for healthcare professionals, gaps in public policies being identified and delivery of improved and cost effective healthcare. To further understand the management of community acquired pneumonia, an audit of the clinical pathway used in the Accident and Emergency (A&E) department of Princess of Wales Hospital, Bridgend, UK, was performed.

Methodology
The Princess of Wales Hospital radiological database was searched using the query “consolidation” between September 2008 and February 2009. Three hundred and thirteen potential cases were found, and of those one hundred were identified to have pneumonia on the electronic database. Hospital acquired pneumonia, paediatric and pregnant cases were excluded. These one hundred cases were audited based on the appropriateness of investigations, severity and prognostic features of each case as well as the overall medical management.

Results
The initial investigations for community acquired pneumonia (CAP) listed in the guidelines include full blood count (FBC), urea, creatinine and electrolytes (U&Es), arterial blood gases (ABG), atypical viral titres, blood cultures if the noted body temperature is greater than or equal to 38°C, chest radiographs (CXR), electrocardiogram (ECG) and sputum for culture and sensitivity (see appendix). It was observed that very few patients had atypical viral titres measured, hence this parameter was excluded from the audit. As seen in Figure 1, the vast majority of patients had FBC, U&E, ECG and CXR done. 16% of patients did not have their U&E recorded as their blood samples had haemolysed requiring a further sample. Only 17% of patients had ABGs performed and 40% had sputum cultures collected. Figure 2 shows that blood cultures were taken from 29 patients. However out of those, only eight had a temperature greater than or equal to 38°C. On the other hand, it was observed from the cohort study that blood cultures were not done for nine patients despite having a temperature of 38°C or higher.

Keywords: Community Acquired Pneumonia, CURB-65 scoring, clinical guidelines, audit, accident and emergency

Figure 1: Percentage of patients with community acquired pneumonia who undergone initial investigations.

Figure 2: Percentage of blood cultures performed based on body temperature.
Initial assessment of CAP severity was performed using the CURB-65 scoring system whereby a point is scored for each of the following: new mental confusion (abbreviated mental test score less than 8), urea >7mmol/L, respiratory rate of over 30/min, low blood pressure (systolic blood pressure <90mmHg, and/or diastolic blood pressure <60mmHg) and age over 65. The overall picture of CAP severity presenting to A&E over the period of September 2008 and February 2009 is illustrated in Figure 3, with 13% presenting with a CURB-65 score of 0, 29% scoring 1/5, 26% scoring 2/5, 20% scoring 3/5, 10% scoring 4/5 and none scoring 5/5.

Apart from CURB-65 score, poor prognostic features such as co-existing disease (ischaemic heart disease, cancer, chronic lung disease, diabetes mellitus, CVA), WCC <4 or >20, hypoxia (sats <92%, or pO$_2$ ≤60mmHg), multiorgan involvement and albumin <35g/L also influence the severity of CAP. A positive blood culture result is also a marker of poor prognosis which is listed on the clinical pathway. However, as cultures do take several days to grow, this parameter was not included in the assessment of CAP severity.

Patients were stratified into 4 different classes in accordance to the severity as per the local guidelines illustrated in appendix. Patients with no poor prognostic factors were classified into either class 1 or 2 dependent on their CURB score and age. Patients with one poor prognostic feature were automatically placed into class 3 or above and those with two or more poor prognostic features, or have a CURB-65 score greater than 3 were treated as severe CAP (class 4). Figure 4 illustrates that the majority of patients attending A&E were classified to have moderate to severe CAP when the prognostic features are taken into account.

**Discussion**

In general, all patients with CAP received a CXR in this cohort study as the initial selection of patients was achieved by using the radiographic database. Only 17% of patients had ABGs performed in view of it being an invasive test and may not be appropriate for patients with high oxygen saturations on air. Request for sputum sample was documented for only 40% of patients. The low percentage for sputum sample request may be partly attributed to the fact that not every patient with CAP was able to expectorate, however, these figures can definitely be improved upon.
signs at different points in time (i.e., systolic blood pressure of 89 on admission, which improved to 92 when patient was seen), or different cut-off points used, for example several patients were documented as scoring 1 point for respiratory rate, when the documented as 28 breaths per minute.

In terms of management compatibility with the trust guidelines, Figure 6 illustrates the differences in CAP severity classification between the management plan for patients (according to whether they were admitted and type of antibiotics given) and that which is suggested by clinical guidelines (according to CURB-scoring and presence or absence of poor prognostic features).

![Figure 6: Differences in CAP severity classification between management plan and guidelines](image)

For example patients required admission if they were in class 2 or above, and only required intravenous antibiotics if they were in class 3 of the severity stratification. A score of -2 means guidelines underestimated management plans by 2 classes, and a score of +2 means that according to the guidelines, the management plan should have been stepped up by 2 classes. After comparison of the actual management plan with the recommended guidelines, it was found that only 44% of cases were identical to that suggested by the guidelines. The remaining patients were more often managed as having a lower severity compared to the scoring system. Possible reasons include the artificial cut-off points in the guidelines, for example patients with a white cell count of 19.9 are not considered to have a poor prognostic feature, but if they had a slightly higher white cell count of 20.1, they are automatically placed into a class 3 CAP or above, even if they have a CURB-65 score of 0.

**Conclusion**

Clinical guidelines provide us with guidance in management of diseases, and are particularly useful in conditions such as CAP, which is widespread and is immensely varied in terms of severity. However, this audit demonstrates that clinical management does not always follow the pathway, particularly with judicious use of blood cultures, sputum sample requesting, accuracy of CURB-65 scoring and management of patients in accordance to risk stratification. This lack of adherence to the published guidelines is consistent with findings in literature and should be addressed by dissemination of the above article to junior doctors in Princess of Wales Hospital. However, one must remember that these guidelines are only a protocol and when faced with difficult or unusual CAP cases, deviance from these guidelines is acceptable, provided sound clinical judgment is applied.
EMERGENCY UNIT COMMUNITY ACQUIRED PNEUMONIA (CAP)

Management of patients with CAP depends on clinical assessment and severity scoring with the CURB-65 score. Diagnosis is made on clinical features including bronchial breathing and/or consolidation on CXR. Patients with mild or moderate pneumonia may be suitable for discharge or, managed in CDU. Patients with severe pneumonia should be treated aggressively, potentially on HDU. Discuss all patients with a Senior in ED.

Rapid initial assessment in ED FBC, U&E, gluc, ABG, Blood cultures if temp ≥ 38, atypical viral tires, CXR, ECG, Sputum for C+S, O₂ as appropriate.

Assess severity of CAP with CURB-65 (score out of 5)
- Confusion (new onset)
- Urea >7mmol/L
- Respiratory rate >30
- Blood pressure (SBP <90mmHg or DBP <60mmHg)
- Age>65

Assess for poor prognostic features, if 2 or more, treat as severe pneumonia
- Co-existing disease (IHD, Cancer, Chronic lung disease, DM, CVA)
- WCC<4 or >20
- Hypoxia: sats <92%, pO₂≤60mmHg
- Multilobar involvement, Albumin <35g/L, Positive blood culture

Score 0-1 No poor prognostic features
- Social reasons preventing discharge
- Age >65

Score 2 No poor prognostic features
- Possible discharge on amoxicillin 500mg tds (clarithromycin if penicillin allergy) for 7 days. Clinical review by GP at 6 weeks. At review those with No symptoms or signs Non-smoker/Age <50 do not need a re-Xray Otherwise they do Letter to GP explaining this

Score <3 1 poor prognostic feature
- Admit CDU under care of Acute Care Physicians
- Oral amoxicillin 500mg tds and oral clarithromycin 500mg bd continued o discharge for 7 days. Oxygen if hypoxic. 4 hourly obs. Letter to GP Give CXR form to patient for repeat film in 4-6

Score ≥3 ≥2 poor prognostic features
- Admit Ward
- Intravenous amoxicillin 500mg tds plus clarithromycin 500mg bd orally
- Oxygen
- Consider IV fluid 4 hourly obs

Severe pneumonia
- Ward 2 / Consider HDU
- IV augmentin 1.2g tds or IV cefuroxime 1.5g tds or cefotaxime 1g tds PLUS IV clarithromycin 500mg bd

Failed discharge at <48 hrs Admit Ward
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