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## Original Article

# Evaluation of hospital admission criteria for community acquired-pneumonia patients at a private hospital in UAE

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## ABSTRACT

**Background/Aim:** Pneumonia is one of the most common causes of morbidity and mortality worldwide. From a pharmaco-economic point of view, it is better for patients with pneumonia who do not need hospitalization to be seen as out-patients; as soon as they are cured they can return to their work right away. The aim of this study is to evaluate the diagnostic and therapeutic procedures used to assess CAP patients and assess of the severity of CAP patients and the need for hospitalization.

**Methods:** A retrospective descriptive and comparative study of all patients suffering from CAP. Revision of archives files of the hospital in the period between 1st of December 2007 and 30th November 2012 which includes 403 patients' files. The evaluation of admission criteria was carried out according to the CURB-65 model for severity assessment.

**Results:** Four hundred and three patients were evaluated (277 males and 129 females) with variations in population age ( $P = 0.0001$ ; toward lower age "95% CI" using one sample T test), of those only 35 cases (8.6%) were found to have all the criteria available for implementing the CURB-65 model; from those 10 (37%) out of 27 low risk patients were admitted and 1 (12.5%) out of 8 high risk patients was treated as an out-patient. The mean respiratory rate was low (23 bpm) with a significant difference toward children ( $P = 0.0001$ ; 95% CI) using one way ANOVA. The mean urea level was high (9.4 mmol/l) with a significant difference toward the elderly ( $P = 0.0001$ ; 95% CI) using one sample T test. Other factors that are needed for the effective use of the model were also evaluated like FBC,  $SO_2$ , sputum and microbiological investigation. Monotherapy was the choice for (77%) of the cases.

**Conclusion:** This study concludes that CURB-65 is not utilized in the way it should be when dealing with pneumonia patients. It is recommended that hospital administrations take action in the follow up process in order to prevent individual decisions made by physicians.

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## 1. Introduction

Pneumonia is one of the most common causes of morbidity and mortality worldwide.<sup>1</sup> The prevalence of pneumonia has

increased over the years in the United States,<sup>2,3</sup> England,<sup>4</sup> the Netherlands,<sup>5</sup> Denmark,<sup>6</sup> and the United Arab Emirates (UAE).<sup>7</sup> From a pharmaco-economic point of view, it is better for patients with pneumonia who do not need hospitalization

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to be seen as out-patients; as soon as they are cured they can return to their work right away. However, in-patients stay in the hospital for days, which delays their return to work.<sup>8</sup> Choice of therapy, and type of antibiotic can affect the costs associated with drug administration as the treatment can be either monotherapy or a combination of different antibiotic groups.<sup>9,10</sup> Patient adherence to the therapy also plays a role in improving the outcome and reducing the cost.<sup>11</sup> Initial treatment of pneumonia is based on physical examination findings, laboratory results, and patient characteristics.<sup>12</sup> Community-acquired pneumonia (CAP) patients can be managed either as in-patients or out-patients. Classifying patients into high risk or an acute life-threatening condition and lower risk, may affect the medical decision to either treat as an in- or out-patient. CURB-65 is a well known score used for the evaluation of the admission criteria among CAP patients and it is preferable due to their simple calculation, the applicability for both hospital and ambulatory setting, and similar predictability of mortality as pneumonia severity index (PSI). Clinical judgment is one of the factors which might affect the decision of where to treat the patient. Choosing between out-patient and in-patient treatment is a crucial decision because of the possible risk of death, and that it will affect the diagnostic pathway, treatment and medication choices, and patient response.<sup>13</sup> Many healthcare providers do not follow guideline recommendations for the use of the pneumonia severity assessment models to determine the initial site of treatment for patients with CAP; and they found that they hospitalize many low risk patients with CAP. Although, higher risk patients are infrequently treated as out-patients.<sup>14,15</sup> For that reason, this research has been conducted to evaluate the utilization of CURB-65 score for admission of CAP patients in a private hospital in UAE. It also evaluates the diagnostic and therapeutic procedures using CURB-65 in order to assess severity of CAP patients and the need for hospitalization.

## 2. Methods

CURB-65 is one of the preferred methods to predict the need for hospital admission in-patients with CAP,<sup>16</sup> it is widely used as a severity score for patients with CAP in Europe.<sup>16</sup> Proper utilization of CURB-65 for the prevention of mortality and morbidity among patients suffering from CAP is the main outcome of this study. A retrospective evaluation study of all in-patients/out-patients suffering from CAP who are treated in a private hospital (in the UAE) in the period from 1st December 2007 to 30th November 2012. Including: CAP patients with or without other medical conditions, all age groups and both male and female gender were included. Excluding: cancer patients, HIV patients, pregnancy, breast feeding patients, hospital acquired pneumonia patients, ventilator-associated pneumonia patients, atypical pneumonia patients, cytomegalovirus patients, pneumocystis carinii pneumonia patients and aspiration pneumonia patients. Data retrieved from patient files only included: Those who were previously treated in the hospital, general information, diagnostic criteria, treatment given as empirical therapy or after sensitivity test or at discharge and severity assessment of CAP

for all patients. Severity level was determined only for those who had completed all the necessary information, where diagnosis and site of treatment had been determined for all cases. Retrospective descriptive and comparative study of 403 patients' files was done according to exclusion and inclusion criteria. Data entry analysis statistical program for social sciences version 16 (SPSS ver. 16) was used. For comparative evaluations the following statistical test were used; one sample T test, T test for independent variables and one way ANOVA.

## 3. Results

The main objective of this research is to evaluate the diagnostics and therapeutic procedure using CURB-65 to assess CAP patients including the need for hospitalization. Three hundred fifty seven patients were treated as out-patients and 46 patients were treated as in-patients. The mean age was 31 years, compared with the cut-point in the risk calculation (65-year-old). There were no significant differences between the mean of age among male and female genders ( $P = 0.66$ ; 95% CI) using T test for significant differences. The mean of respiratory rate values is 23 bpm. This value was compared with the cut-point in the risk calculation (30 bpm). Females demonstrated higher respiratory rates than males and this difference was significant with  $P = 0.014$ ; (95% CI using T test for independent variables). It is worth mentioning that the number of male cases with available respiratory rate data was 119 (22.6% children, 74.7% adult and 2.5% elderly) but it was only 60 for female gender (36.6% children, 58.3% adult and 5% elderly). There was a significant difference between the respiratory rate mean for children, adults and the elderly with the highest value for children, then the elderly, then adults ( $P = 0.0001$ ; 95% CI) using one way ANOVA. There was no significant differences between the mean of urea value among male and female genders ( $P = 0.67$ ; 95% CI). T test was used for the significant differences of independent variables. It is worth mentioning that the number of male cases with available urea data was 51 but it was only 21 for the female gender. The mean urea level mean was 9.4 mmol/l, which was compared with the cut-point in the risk calculation (7 mmol/l = 19.6 mg/dl). There was no significant difference in the mean urea value between the children, adults and the elderly with ( $P = 0.35$ ; 95% CI) using one way ANOVA. Females had a higher mean blood pressure reading than males but this was not significant ( $P = 0.24$  for both SBP and DBP; 95% CI).

SBP and DBP measurements means were 127 mmHg and 77 mmHg respectively. These values were compared with the cut-point in the risk calculation (90 mmHg and 60 mmHg respectively). There were significant differences in SBP and DBP between children, adult and elderly with ( $P = 0.0001$ ; 95% CI) using one way ANOVA and this differences toward elderly.

The number of patients who had all the necessary information to calculate the CURB-65 score was 35 patients (8.6%). Patients who had only pneumonia accounted for (20, 57%) and patients with coexisting diseases (15, 43%). Coexisting diseases consisted of diabetes and hypertension (3), patients with asthma (4), patients with diabetes mellitus (5), patients with gastritis (1), patients with asthma, and patients with hypertension and

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