

## Community-acquired pneumonia in patients admitted to National District Hospital in Bloemfontein: guideline adherence

Thornton Ford<sup>a</sup>, Johané Potgieter<sup>a</sup>, Jana Van der Walt<sup>a</sup>, Monette Van Schalkwyk<sup>a</sup>, Maresa Van Lill<sup>b\*</sup> and Gina Joubert<sup>c</sup>

<sup>a</sup>School of Medicine, University of the Free State, Bloemfontein, South Africa

<sup>b</sup>Department of Family Medicine, University of the Free State, Bloemfontein, South Africa

<sup>c</sup>Department of Biostatistics, University of the Free State, Bloemfontein, South Africa

\*Corresponding author, email: [VanLillM@ufs.ac.za](mailto:VanLillM@ufs.ac.za)



**Background:** Patients with suspected community-acquired pneumonia (CAP) are managed according to treatment guidelines. This study aimed to determine the guideline adherence of health professionals at National District Hospital (NDH), Bloemfontein. **Methods:** This retrospective descriptive study included a study population of 149 patients admitted to NDH with suspected CAP from January 2015 to September 2016. Information was noted from the patient files and included signs and symptoms, investigations done and medication prescribed.

**Results:** Most patients ( $n = 111$ , 75.0%) presented with a cough, 87 (60.0%) had a sputum test and 125 (83.9%) had a chest X-ray of whom 108 (86.4%) had a consolidation on the X-ray. The CURB-65 score of five (3.4%) patients was mentioned in the files, of which only three patients' scores were indicated. One patient had a noted CURB-65 score that required admission.

**Conclusion:** The adherence of health professionals to the treatment guideline for suspected CAP patients is poor.

**Keywords:** community-acquired infections, guideline adherence, pneumonia, sputum, cough

### Introduction

Community-acquired pneumonia (CAP) is contracted outside health facilities and is considered the most important infectious disease encountered in clinical practice.<sup>1,2</sup> Signs and symptoms include a new infiltrate visible on a chest X-ray with at least two symptoms, such as a cough and sputum production, present.<sup>3</sup>

If a patient is suspected to have CAP, a guideline based on the Standard Treatment Guidelines and Essential Medicines List for South Africa is used by public health professionals to determine the course of treatment.<sup>4</sup> The guideline, in the form of an algorithm, states that patients with suspected CAP should undergo chest radiography and their CURB-65 score should be determined. CURB is an acronym for confusion (C), blood urea (U), respiratory rate (R) and systolic blood pressure (B) and is defined as a clinical prediction rule to predict mortality of infection at any state.<sup>5</sup> CURB-65 adds age  $\geq 65$  years as variable. Patients should be admitted to hospital with a CURB-65 score of  $\geq 2$ .<sup>4</sup>

This study aimed to determine the adherence to the treatment guideline by the health professionals treating patients with suspected CAP at National District Hospital (NDH), Bloemfontein.

### Methods

The study population for this retrospective descriptive study comprised all patients aged 15–85 years admitted to the medical wards at NDH with suspected CAP from January 2015 to September 2016. Patients were identified from the patient register and information noted from patient files. Patients admitted with CAP to the casualty department only and patients with a suspected hospital-acquired pneumonia were excluded.

The Health Sciences Research Ethics Committee, UFS [HSREC-S 29/2016] and the Free State Department of Health gave permission. A pilot study of 10 randomly selected patient files

was conducted at NDH. Data from the 10 patients were included in the main study. Data were analysed by the Department of Biostatistics, Faculty of Health Sciences, University of the Free State (UFS). The results were reported as frequencies and percentages.

### Results

The majority (52.4%) of the 149 patients were female. The patients' mean age was 48.7 years and 85.2% were  $\leq 65$  years.

Table 1 indicates signs and symptoms of patients who were diagnosed with CAP, the tests performed and medications prescribed.

### Discussion

Only 60.0% of patients had sputum samples, whereas the guideline requires that a sputum microscopy culture and sensitivity (MC&S) and GeneXpert® (GXP; Cepheid, Sunnyvale, CA, USA) test should be done for every patient with suspected CAP in order to make a definite diagnosis.<sup>4</sup> Patients were thus mainly treated without knowledge of the specific causative organism, which could lead to prolonged hospitalisation and organism resistance.

Only one of the 149 admitted patients in this study had a noted CURB-65 score that required admission. The guideline states that when a patient has a CURB-65 score  $< 2$  but the doctor still admits the patient, the treatment differs according to the patient's age. For patients  $< 65$  years, the treatment includes penicillin G, amoxicillin and azithromycin. For patients  $\geq 65$  years, the treatment comprises amoxicillin/clavulanate, ceftriaxone and azithromycin. For patients with CURB-65 scores  $\geq 2$ , the treatment also comprises amoxicillin/clavulanate, ceftriaxone and azithromycin. In all three scenarios, fluoroquinolone is recommended as an alternative. These medications were,

**Table 1:** The symptoms and signs of patients, investigations done and antibiotics prescribed.

Factor	n (%)
<b>Sign:</b>	
Cough (n = 148)	111 (75.0)
Cough: productive (n = 111)	59 (72.0)
Shortness of breath (n = 148)	114 (77.0)
<b>Symptoms:</b>	
Fever (n = 145)	32 (22.1)
Bronchial breathing (n = 149)	11 (7.4)
Crepitations (n = 86)	86 (57.7)
Wheeze (n = 149)	26 (17.5)
Clear (n = 149)	25 (16.8)
<b>Special investigations (n = 149)</b>	
Chest X-ray (n = 149)	125 (83.9)
Consolidation (n = 125)	108 (86.4)
Urea (n = 130)	146 (89.0)
Sputum tests (n = 145)	87 (60.0)
Organism cultured (n = 145)	9 (6.2)
CURB-65 calculated (n = 147)	5 (3.4)
CURB-65 score indicated (n = 5)	3 (60.0)
CURB-65 score 2+ (n = 3)	1 (33.3)
<b>Antibiotics prescribed (n = 149):</b>	
ampicillin	60 (40.3)
amoxicillin*	8 (5.4)
ceftriaxone	0 (0)
penicillin G	0 (0)
azithromycin	40 (26.9)
fluoroquinolone	1 (0.7)
cefazolin	25 (16.8)
none	23 (15.4)

\*Seven cases in combination with clavulanate.

however, given to the minority of patients. The use of antibiotics other than those suggested by the guideline may be due to pharmacy stock shortages or clinician suspicion.

## Conclusion

The health professionals at NDH did not adhere to the treatment guideline prescribed for the management and treatment of a suspected CAP patient.

## Recommendations

Further research is recommended regarding the management approaches used by health professionals at NDH in the treatment of suspected CAP patients.

*Ethical considerations* – No ethical clearance was required for this study.

*Disclosure statement* – No potential conflict of interest was reported by the authors.

*Funding* – No funding was received for this study.

## References

- Chalmers JD, Mandal P, Singanayagam A, et al. Severity assessment tools to guide ICU admission in community-acquired pneumonia: systematic review and meta-analysis. *Intensive Care Med* 2011;37(9): 1409–1420. doi:10.1007/s00134-011-2261-x.
- Bartlett JG. Diagnostic Tests for Agents of Community-Acquired Pneumonia. *Clin Infect Dis* 2011;52(Suppl 4): S296–S304. doi:10.1093/cid/cir045.
- Lee RW, Lindstrom ST. A teaching hospital's experience applying the Pneumonia Severity Index and antibiotic guidelines in the management of community-acquired pneumonia. *Respirology*. 2007;12(5): 754–758. doi:10.1111/j.1440-1843.2007.01121.x.
- Feldman C, Brink AJ, Richards GA, Maartens G, Bateman ED. Management of community-acquired pneumonia in adults. *S Afr Med J*. 2007;97(12): 1295–1306.
- Lim WS, van der Eerden MM, Laing R, et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003;58(5): 377–382. doi:10.1136/thorax.58.5.377.

Received: 13-11-2017 Accepted: 6-05-2018