Short communication

Duration of antibiotics in Community acquired pneumonia, Physicians fancy?

Abstract:

In spite of guidelines on the use of antibiotics in Community acquired pneumonia (CAP), very often the antibiotics are prescribed for longer than necessary. Of the 37 in-patients with CAP over a 25-month period,12 had reasons for a longer antibiotic course. In the remaining 25, ten received antibiotics for ≤ 7 and 15 for more than 7 days. Respiratory rate (37.73±5.27; p=0.001) and albumin levels (23.53± 4.32; p=0.039) were higher in patients who received the longer course. Extent of opacities (p=0.690); single lobe 9 (60%). > 1 lobe unilateral 1 (100%) and bilateral 5 (55.6%) or the pattern; lobar 10(83.3%), segmental 1(20%) or interstitial 4 (50%); > 65 years 7 (53.8%); male 9 (60%), prior antibiotics 4 (57.1%), co-morbidities 11 (61.1%), Diabetes 8 (57.1%), aspiration risk 3 (42.9%) or higher CURB score 7(63.3%) did not influence the prescription. We find that physicians use their instinct rather than scientific backing in this decision. Often antibiotics are continued on discharge possibly due to a feeling of protection

Keywords: Antibiotics, Pneumonia

Introduction

Guidelines on community acquired pneumonia (CAP) recommend that the duration of antibiotic therapy should be guided by a validated measure of clinical stability, ability to eat and normal mentation.[1] Currently antibiotics are given until the patient remains afebrile and clinically stable for at least 48 hours. Generally, patients with mild infection receive five to seven days and those with severe infection 7 to 10 days of antibiotics. Longer courses may be required for patients who are immunocompromised, have infections caused by certain pathogens, or have complications. Very few hospitals use a clinical score in deciding on the duration antibiotics. Many use subjective assessment and this may be influenced by the practices as well as the personal conviction of discharging these patients on an unnecessary antibiotic course. A wide spectrum of patient, care provider, system and guideline barriers exist preventing physicians from adhering to CAP guidelines.[2]

Materials and method

We looked at the antibiotic prescription in patients admitted with CAP in Sultan Qaboos University Hospital, Muscat, Oman over a 25 months period, 1st January 2015 to 30th January 2017. Usual pneumonia diagnostics were used and CAP was defined as a new pulmonary infiltrate on chest radiograph plus at least one compatible symptom, such as cough, fever,

dyspnoea and chest pain. Patients with aspiration pneumonia, viral pneumonia, exacerbations of chronic pulmonary diseases or hospital-acquired pneumonia were excluded, as were immunosuppressed patients and patients admitted under haematology and oncology units. There were 37 patients, males 20 (54.1%) and females 17 (45.9%). The pattern on the chest radiograph was Lobar in 22 (59.5%), Segmental in 5 (13.5%) and Interstitial in 10 (27%). The extent of these abnormalities was: single lobe in 20 (54.1%), > one lobe unilateral in 5 (13.5%) and Bilateral in 12 (32.4%). Majority of the patients, 33 (89.2%) received combination antibiotics while only one antibiotic was given in 4 (10.8%). The mean age was 61.24 ± 15.7 years, mean WBC count 11.24 ± 5.05 $x10^9$ and haemoglobin 11.34 ± 1.52 gm%. CURB score was 0 in 11 (29.7%), 1 in 10 (27.0%), 2 in 10 (27.0%) and 3 in 6 (16.2%)

Twelve patients had plausible reasons for a longer antibiotic course. Two patients had lung abscess, 2 had empyema, 3 had severe CAP and ARDS, 1 patient had a documented slow resolution, 2 had pneumonia and UTI, 1 had additional Mucormycosis and *Mycoplasma* was identified in 1. So, we looked at the factors leading to prescription of antibiotics for more than 7 days in the remaining 25 patients who did not have any documented complications or additional factors. Ten patients received antibiotics for ≤ 7 days and 15 patients for more than 7 days.

Results and discussions

Respiratory rate on admission was higher in patients who received antibiotic longer than 7 days (23.53± 4.32; p=0.039). These patients also had a higher mean albumin level (37.73±5.27; p=0.001). There was no difference in the mean age (p=0.388), heart rate (p=0.734), systolic blood pressure (p=0.058), white cell count (p=0.820), blood urea (p=0.803), serum sodium (p=0.581) and CRP (p=0.442) between the patients receiving antibiotics less than or more than 7 days. Extent of the lesions in chest radiograph; single lobe 9 (60%) more than one lobe unilateral 1 (100%) and bilateral 5 (55.6%) did not influence the prescription (p=0.690). Chest radiograph pattern, lobar 10(83.3%), segmental 1(20%) or interstitial 4 (50%) also did not lead to the decision on the duration of antibiotics.

In the patients receiving antibiotics for longer than 7 days, the following factors ,n(%); > 65 Age 7 (53.8%); male gender 9 (60%), receiving antibiotics before 4 (57.1%), presence of co-morbidities 11 (61.1%), Diabetes 8 (57.1%), risk factors for aspiration 3 (42.9%) or higher CURB score 7 (63.3%) did not show any statistical significance when compared with the group receiving antibiotics less than or equal to 7 days.(Figure 1) Symptoms of cough 13 (59.1%), Fever 11 (57.9%) and Dyspnoea 5 (83.3%) also were not statistically different between these groups.

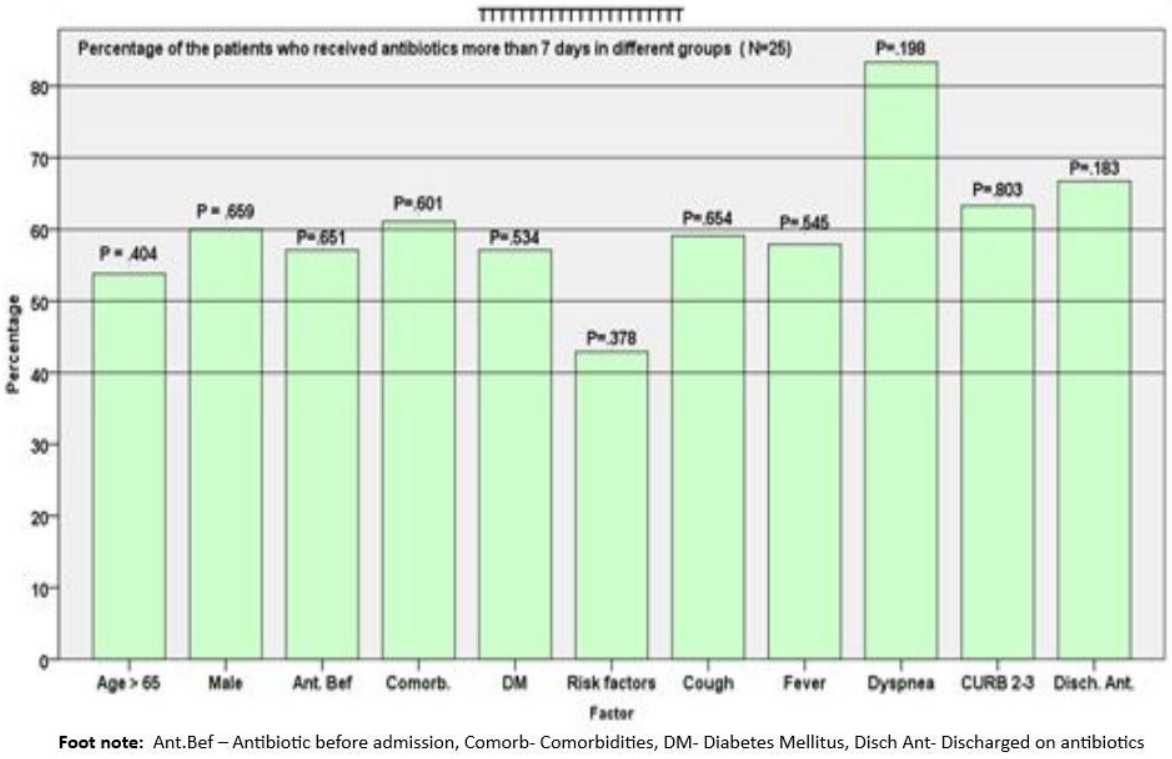

Figure 1. Percentage of the patients who received antibiotics > 7 days in different groups (N=25)

We did not find any significant differences in the duration of therapy between patients older than 65 years or less than 65 years, or patients with or without multilobar involvement. No linear relationship was noted with severity of the disease as assessed by the CURB score. Our physicians did not consider patient severity on admission, age, co-morbidities or risk factors in determining the duration of therapy in patients admitted outside the ICU.

Despite various recommendations, arbitrarily longer treatments remain common.[3] Echeverría in an editorial mentions that they often prescribe 10-day courses of antibiotics without considering the implications this may have on patients.[4] A study from Veterans Affairs Medical Centre in Houston reported a median duration of 12 and 13 days for confirmed and presumed CAP.[5] It seems that, a standard 10–14 day approach is still used in clinical practice, leading to a good number of patients remaining on antibiotics for longer than necessary.[6]

In a WHO report reviewing 14 clinical practice guidelines of different societies or countries, the authors noted that the recommendations on duration of therapy varied significantly between 5 to 10 days for mild CAP, and 5 and 14 days for severe CAP.[7] They did

not find any objective tool in these guidelines on how to define length of therapy at individual patient´s level. Choudhury et al observed that younger age, earlier clinical stability and a lower CURB-65 score at admission were significantly associated with shorter duration of antibiotic treatment.[8] Nevertheless, we did not find any association between age, gender, CURB score or the extent of involvement.

Researchers with the CDC's Division of Healthcare Quality Promotion found prescription of antibiotics on discharge contributed to longer than recommended antibiotic courses in a large number of hospitalized patients. They calculated that the more than 70% of patients receiving excessive antibiotic treatment translated to 71,474 and 375,289 unnecessary days of treatment for patients below 65 and above 65 respectively.[9] Two thirds received excess antibiotics in another study on more than 6000 patients with pneumonia at 43 hospitals, largely due to excessive prescribing at discharge.[10] In our group, there was a tendency to keep the patients longer and with 66.7 % of them receiving antibiotics on discharge

Shortening the duration of antibiotics will limit antibiotic resistance, reduce adverse events, reduce length of stay, decrease costs, and improve patient adherence and tolerability. With more evidence on courses of antibiotics of ≤5 days, physicians will feel confident to use shorter courses of antibiotics in their treatment of patients.[11, 12] Factors physician might consider in prescribing longer antibiotic treatment could be extensive diagnostic testing, waiting for culture reports, receiving a high-risk antibiotic before hospitalization and longer hospital stay.[10] The points that help the clinician in deciding on the duration in an uncomplicated CAP could be the initial severity of illness, comorbidities, prescribed antibiotics, defervescence, switching to oral antibiotics, decreasing procalcitonin levels, radiological resolution, isolation of organisms and clinical stability.[6, 13].

Conclusion

Historically, CAP treatment duration has been variable and not always with clear evidence. We feel that the longer prescription of antibiotics is possibly left to the physician's decision without any real basis. Scalera et al attributes this is perhaps to the "feeling of protection" that physicians experience when their patients are on antibiotics.[14] Our numbers are small and so will need further larger studies to clearly define a clinical tool to decide on the antibiotic duration in patients admitted with CAP. Most studies have focused on mild to moderate CAP, and therefore more clinical trials are required to evaluate patients with severe CAP and elderly. Indeed, addressing the excessive length of stay and antibiotic prescribing at time of discharge for uncomplicated CAP should be a part of antibiotic stewardship programs.

Ethical Approval. Ethical approval was granted by the Ethics Committee, College of Medicine and Health Sciences, Sultan Qaboos University. MREC#1278

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