



Prevention and management of pneumonia in the elderly

KEYWORDS

pneumonia, elderly

Meng-Jung Chen

Chi-Mei Medical Center 901, Chung-Hwa Road, Tainan, Taiwan

ABSTRACT **Background:** Pneumonia is among the leading causes of mortality in the elderly and a primary reason for admission. This study focuses on for prevention and management for pneumonia in the elderly.

Methods: This is a study of pneumonia in the elderly including data in the community and in the nursing home.

Results and Discussion: Current recommendations for pneumonia prevention include flu vaccines for people over 50 and healthcare workers. Pneumococcal vaccine is recommended for people over 65 or with high-risk conditions. Additional recommendations include smoking cessation and respiratory measures including hand hygiene, use of mask and education.

Clinicians should know the most likely pathogens in patients with different environment to select an antimicrobial. Early use of antimicrobial has the advantage of treating pneumonia early, and may avoid the need for hospital transfer.

Conclusions: Prevention and early treatment of pneumonia in the elderly, including vaccine and early use of antimicrobial can influence patient outcomes and prevent from hospital admission. It is important that practitioners are up-to-date with current guidelines

Introduction

Pneumonia is among the leading causes of mortality in the elderly and a primary reason for admission to hospital. This study focuses on recent studies for diagnostic work up, and current management for pneumonia in the elderly.

Methods

This is a study of pneumonia in the elderly with special focus in the community and in the nursing home, using data from pubmed, medline and Cochranlibrary databases.

Results

Pneumonia is the third leading cause of death in the world. Community-acquired pneumonia (CAP) is a common disease that causes a significant burden particularly in the elderly. Antibiotics are used for treatment for CAP. However, increasing use of antibiotic is also associated with increased bacteria resistance and side effects.

Appropriate treatment of CAP is sometimes very difficult. Physicians usually select empiric antimicrobial therapy using clinical judgment, local prevalence, and personal preference sometimes. This may lead to inappropriate use of antibiotics.

Underlying conditions, such as alcoholism, smoking, heart, lung disease and diabetes mellitus, are often present in these patients. About 10 percent of hospitalized patients with severe CAP is associated with a higher mortality rate. The most common pathogen found in CAP include *S. pneumoniae*, *S. aureus*, group A streptococci and *H. influenzae*; the common atypical pathogens include *M. pneumoniae*, *C. pneumoniae* and *Legionella spp.* Other pathogens in critically ill patients include Gram-negative bacilli and MRSA. Early use of empirical antimicrobial treatment is important for a good outcome. Initial antibiotics use should include an -lactam antibiotic plus a macrolide or a fluoroquinolone.

There are risk factors and severity criteria assessments to assist with decisions making in determining the necessity of hospitalization including age, vital signs, underlying disease and laboratory abnormalities. If there are signs of impending respiratory failure or septic shock, admission to ICU should be considered.

Bacterial pathogens such as pneumococcus, *Haemophilus influenzae*, and enteric gram-negative organisms usually come with productive cough, high fever, chills, fast heart and respiratory rate. While, atypical pathogens such as *Mycoplasma*, *Chlamydia*, and viruses often come with nonproductive cough. *Legionella* may

present with gastrointestinal symptoms. A detailed history, including travel, animal or bird contact, asplenia, organ transplant with immunosuppressive therapy, human immunodeficiency virus, could lead to an otherwise unsuspected pathogen.

Physical findings in pneumonia are usually nonspecific and include fever, chills, muscle pain, or headaches. Chest findings in pneumonia are usually localized to a specific area with rales, rhonchi, increased fremitus or decreased breath sound. Atypical pneumonia may have negative or diffuse findings on chest examination. Rapid deterioration from nonspecific symptoms to respiratory failure can happen in *Legionella pneumoniae*.

Laboratory examinations such as sputum, blood cultures, influenza rapid test, urinary antigen tests for *Legionella* and other examination can be used if available or indicated. Patients with cough lasting for months, mild fever, weight loss should be ruled out for *tuberculosis*. The key diagnosis is the chest X-ray, which may reveal an infiltrate. But, this may be absent in dehydrated, neutropenic, or obscure in comorbid patients.

Discussion

Physicians sometimes admit patients to the hospital who could be well treated as outpatients or who would prefer to be treated at home. This decision of hospitalization for pneumonia involves determination of disease severity, assessment of any preexisting conditions, home care family support and clinical judgment.

Older patients usually have certain immunodeficiencies as a result of underlying diseases, under immunosuppressive or chemotherapy. Older patients with pneumonia have fewer symptoms than do younger ones, and consciousness changes are commonly the main presenting symptom. Delirium may be the only presentation of pneumonia in these patients. Smoking, alcoholism, chronic obstructive lung disease, immunosuppression, are risk factors for community-acquired pneumonia in the elderly. Among nursing home residents, old age, dysphagia with frequent choking, bedridden state with poor activity, and incontinences are all risk factors for community-acquired pneumonia. Aspiration pneumonia is sometimes underdiagnosed in this group of patients if the incident of choking is not observed.

A major goal of treatment is to eradicate the infecting organism, with resultant resolution of clinical condition. As a result, antimicrobials are a mainstay of treatment. Early treatment with inhaled zanamivir or oral oseltamivir in pneumonia caused by influenza appears to

reduce the likelihood of lower respiratory tract complications. Antibiotics choice is important in treating community-acquired pneumonia in the outpatient setting. Initial treatment remains empiric unless better clues are available.

Since combination therapy is not better than monotherapy, monotherapy is preferred on the basis of lower cost and simplicity. Amoxicillin-clavulanate, ceftriaxone, or a fluoroquinolone are popular monotherapy regimens. A β -lactam (amoxicillin-clavulanate or ceftriaxone) used alone is effective against all of the typical pathogens, but misses the atypical pathogens. Doxycycline or macrolides or should not be used as monotherapy in treating CAP, because certain strains of *Streptococcus pneumoniae* are resistant. Doxycycline is included as a cost-effective alternative on the basis of in vitro data indicating effectiveness close to that of macrolides. For patients who can be treated in the nursing home setting and do not need admission, a fluoroquinolone or amoxicillin-clavulanate plus a macrolide is recommended. A second-generation cephalosporin plus a macrolide is a second choice. Anaerobic coverage should be considered for those patients with a history of aspiration. In selecting antibiotics, physicians need to take local epidemiology, resistance and all other aspects into consideration.

Patients with asthma or chronic obstructive pulmonary disorder and a history of use of antibiotics or steroids within the last few months may have an increased rate for infection with *H. influenzae* and enteric gram-negative bacilli, in addition to pneumococcus, and *L. pneumophila*, and a fluoroquinolone is recommended.

Patients treated at outpatient setting or at home must be monitored regularly to ensure adherence to treatment instructions. Follow-up by phone call or a visit within 72 hours is advised.

Patients with CAP should be treated for a minimum of 5 days and longer period may be needed if fever persists.

Current recommendations for pneumonia prevention suggest that the following people should be vaccinated against influenza annually: all people older than 50 who are at risk for influenza complications, household contacts of high-risk people, and healthcare workers. Influenza vaccine should be offered to persons at hospital discharge or during outpatient treatment if indicated. Cases of pneumonia that are of public health concern like SARS or H5N1 should be reported immediately to the health authority.

Additional recommendations include promoting smoking cessation and respiratory hygiene measures including hand hygiene, use of masks and tissues for patients with cough, and patient and family education.

Pneumococcal polysaccharide vaccine is recommended for all persons aged more than 65 years and those aged 2 to 64 years with a chronic health condition, such as heart disease, lung disease, autoimmune disease, diabetes, alcoholism, and liver cirrhosis. All persons aged 2 to 64 years who have an immunosuppressive condition, such as malignancy, renal failure, human immunodeficiency virus infection, asplenia, or organ transplant, should receive vaccine prophylaxis.

Conclusions

Early recognition and treatment of pneumonia in the elderly, including early use of antimicrobial therapy, can influence patient outcomes and mortality rates. Therefore, it is important that practitioners are up-to-date with current guidelines for prevention and management of pneumonia in the elderly.

References

1. Welte T, Torres A, Nathwani D. Clinical and economic burden of community-acquired pneumonia among adults in Europe. *Thorax* 2012;67:71-79
2. Saira Butt, a Edwin Swiatlo. Treatment of Community-Acquired Pneumonia in an Ambulatory Setting. *The American Journal of Medicine* 2011; 124:297-300
3. Mandell, L.A., Wunderink, R.G., Anzueto, A. et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis*. 2007;44:S27
4. Thomas CP, Ryan M, Chapman JD, et al. Incidence and cost of pneumonia in medicare beneficiaries. *Chest* 2012;142:973-981
5. Yu H, Rubin J, Dunning S, Li S, Sato R. Clinical and economic burden of community-acquired pneumonia in the Medicare fee-for-service population. *J Am Geriatr Soc* 2012;60:2137-2143
6. Mene'ndez R, Torres A, Rodri'guez de Castro F, et al. Reaching stability in community-acquired pneumonia: the effects of the severity of disease, treatment, and the characteristics of patients. *Clin Infect Dis* 2004; 39:1783-90.
7. Almirall, J., Bolibar, I., Balanzo, X., and Gonzalez, C.A. Risk factors for community-acquired pneumonia in adults: a population-based case-control study. *Eur Respir J*. 1999; 13:349
8. Rubinstein, E., Kollef, M.H., and Nathwani, D. Pneumonia caused by methicillin-resistant *Staphylococcus aureus*. *Clin Infect Dis*. 2008; 46: S378
9. Marrie, T.J. Community-acquired pneumonia in the elderly. *Clin Infect Dis*. 2000; 31: 1066-1078
10. Craven, D.E., Palladino, R., and McQuillen, D.P. Healthcare-associated pneumonia in adults: management principles to improve outcomes. *Infect Dis Clin North Am*. 2004; 18: 939
11. Hopstaken, R.M., Witbraad, T., van Engelshoven, J.M., and Dinant, G.J. Inter-observer variation in the interpretation of chest radiographs for pneumonia in community-acquired lower respiratory tract infections. *Clin Radiol*. 2004; 59: 743
12. Postma DF, van Werkhoven CH, van Elden LJR, et al. Antibiotic treatment strategies for community-acquired pneumonia in adults. *N Engl J Med* 2015;372:1312-1323
13. Houck, P.M., Bratzler, D.W., Nsa, W, Ma, A., and Bartlett, J.G. Timing of antibiotic administration and outcomes for Medicare patients hospitalized with community-acquired pneumonia. *Arch Intern Med*. 2004; 164: 637-644
14. Janssens JP. Pneumonia in the elderly (geriatric) population. *Curr Opin Pulm Med*. 2005;11:226-30
15. Fine, M.J., Hough, L.J., Medsger, A.R. et al. The hospital admission decision for patients with community-acquired pneumonia. *Arch Intern Med*. 1997; 157: 36
16. Niederman MS, Ahmed QA. Community-acquired pneumonia in elderly patients. *Clin Geriatr Med*. 2003; 19: 101-20
17. File TM. Community-acquired pneumonia. *Lancet* 2003; 362: 1991-2001.
18. Lim, W.S., van der Eerden, M.M., Laing, R. et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003; 58: 377
19. Labarere, J., Stone, R.A., Obrosky, D.S. et al. Comparison of outcomes for low-risk outpatients and inpatients with pneumonia. *Chest*. 2007; 131: 480
20. Anzueto A, Niederman MS, Pearle J, et al. Community-acquired pneumonia recovery in the elderly (CAPRIE): efficacy and safety of moxifloxacin therapy versus that of levofloxacin. *Clin Infect Dis*. 2006; 42: 73-81.