

# Pneumonia in the elderly – diagnosis and treatment in general practice

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## Abstract

Pneumonia is common in the elderly and clinical manifestations are frequently atypical. Pneumonia should be considered in any older person presenting with falls, confusion, incontinence, worsening comorbidities or a deterioration in functional status. The respiratory rate is the most reliable sign to alert the health carer to the presence of pneumonia. Therapy should follow the recommendations of the South African Pneumonia Guidelines. Prevention strategies include the prevention and management of aspiration, reduction in the use of neuroleptic medication, influenza vaccination, maintenance of oral hygiene, smoking cessation and possibly the use of the newer antiviral preparations.

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### Introduction

Pneumonia is an infection involving the alveoli and bronchioles of the lung and may be caused by bacteria (including mycobacterium tuberculosis), viruses and some parasites. The estimated rates of hospitalisation for a primary diagnosis of influenza or pneumonia show a dramatic rise from 6.8 per 100 000 person years in the age group 5-49 years, to 219.5 per 100 000 person years in the age group 75-79 years. In the age group 85 years and older, the rate rises to >600 per 100 000 person years.<sup>1</sup>

Recognising the context in which pneumonia occurs is vital, as the aetiology and management differ depending on the characteristics of the patient and the environment in which the infection occurs. The four most important contexts or settings in which pneumonia occurs are:

- Community-acquired pneumonia (CAP) in the fit elderly person, which can be managed according to standard guidelines.
- Community-acquired pneumonia in persons with significant comorbidities, functional dependence, poor nutritional state and/or cognitive impairment. In these patients, the clinical presentation is often atypical and mortality is up to 30%. Response to appropriate therapy is often slower and the

course of the illness is complicated by delirium, further functional decline and exacerbation of comorbid diseases. The threshold for admission to hospital should be lowered and the need for rehabilitation after the acute illness should be assessed.

- Aspiration pneumonia is common in patients with stroke, vascular dementia and progressive neurological disease, and in patients who are being tube fed. Aspiration is also common in frail institutionalised persons.
- Nursing home-acquired pneumonia (NHAP) may occur in institutionalised elderly persons. Preventive strategies are especially important and the causative organisms may differ from CAP.

### Clinical presentation

Older patients with pneumonia present with a mean of three fewer symptoms than their younger counterparts.<sup>2</sup> The classical diagnostic triad of cough, fever and dyspnoea may only be present in fewer than 60% of patients. Atypical presentations in which pneumonia must be considered include:

- falls
- confusion/delirium
- new or worsening incontinence
- worsening comorbidities (e.g.

worsening cardiac failure) or deteriorating function in activities of daily living

The clinical signs may be misleading. The respiratory examination is often difficult in a frail, confused patient. Auscultation findings are unremarkable in 35% of patients. As a general rule, the older and more debilitated the patient, the more likely the classical pneumonia syndrome will manifest incompletely. A respiratory rate >20 breaths per minute is the earliest and most sensitive sign and may precede other signs by three to four days.<sup>3</sup> This rate is also a useful indicator for nursing staff of cardio-respiratory disease in institutionalised patients.

Pulse oximetry is a readily available and non-invasive means of assessing severity and determines a need for supplementary oxygen therapy. Radiology is important, but may become less specific because of concomitant illnesses such as chronic pulmonary disease, heart failure and underlying malignancy, which hamper interpretation. Follow-up chest X-rays are not required routinely in patients who become asymptomatic and return to their pre-pneumonia status.

The recommended blood tests include a full blood cell count and the

measurement of renal parameters. C-reactive protein (CRP) is a sensitive, age-independent marker that decreases after a favourable treatment response. A CRP level of 100 mg/l or higher has been independently associated with mortality in older patients with pneumonia in the primary care setting.<sup>4</sup>

An older person produces less sputum and coughs ineffectively, thus reliable sputum samples are rarely obtained. Similarly, routine blood cultures rarely contribute to the management of the older patient.

Clinical features of pneumonia associated with a poorer prognosis and/or mortality in the elderly are listed in Table I.

**Table I:** Clinical features associated with a poor prognosis of pneumonia and/or mortality in the elderly<sup>4,5</sup>

- Respiratory rate >30 breaths/minute
- Heart rate >125 beats/minute
- Altered mental status
- Hypotension (systolic BP <90 mmHg)
- History of dementia
- CRP >100
- Acute aggravation of co-morbid chronic diseases, especially diabetes, cardiac, renal and liver.

### Microbiology aspects

The organisms most commonly implicated as causal of pneumonia in the elderly are *Streptococcus pneumoniae* (58%), *Haemophilus influenzae* (14%), *Klebsiella pneumoniae* (0-4%), *Moraxella catarrhalis* (0-4%), enterobacteriaceae and staphylococcus aureus (0-7%). However, the contribution of respiratory viruses is being recognised increasingly and up to 26% of hospital admissions may be caused by a virus. Respiratory viruses include influenza, respiratory syncytial virus, adenovirus and parainfluenza. Synergism between influenza infection and streptococcus pneumoniae infection has been recorded and may explain the increased susceptibility to secondary pneumonia post-viral infection.

Aspiration pneumonia may have both anaerobic (20%) and aerobic organisms (80%) implicated in their aetiology; most are gram-negative *enterobacteriaceae*.<sup>6</sup> The role of clinically silent aspiration is being recognised increasingly in the frail elderly.<sup>7</sup> So-called atypical pneumonia accounts for up to 28% of CAP. Organisms implicated include *Legionella pneumophila* (should be suspected in the case of a paucity of clinical signs with constitutional symptoms, myalgia and diarrhoea), *Chlamydia pneumoniae*, *Coxiella burnetii* and *Mycoplasma pneumoniae*. *Chlamydia pneumoniae* has also been implicated in NHAP outbreaks.<sup>6</sup>

Infection with the Human Immunodeficiency Virus (HIV) does not spare the older population and *Pneumocystis jirovecii* (formerly *pneumocystis carinii*) pneumonia should be considered in the hypoxic HIV infected older person. In an older person, particularly if the patient is not responding to conventional/standard therapy, tuberculosis must always be considered.

### Treatment and referral guidelines

Management will depend on whether or not the patient is hospitalised. Patients who require hospital admission are those:

- With a presence of any of the high-risk features listed in Table I, or<sup>8</sup>

- respiratory rate >30
- pulse rate >90
- temperature <36.5 °C or >38.1 °C
- oxygen saturation ≤92% breathing room air
- feeding tube present (unless prior directive on end of life pneumonia)
- drowsy or severe delirium; or
- Whose home circumstances lack sufficient physical, social or financial resources to ensure adequate care, monitoring and compliance with treatment.

If there is any doubt, it is generally prudent to admit the patient. Regardless of the site of management, early treatment, which requires early recognition, is associated with better outcomes. Antibiotics should be administered promptly.<sup>9</sup> Suggested empiric antibiotic therapy should follow the recommendations of the South African Pneumonia Guidelines.<sup>10</sup> Different first-line therapies are recommended for outpatient and nursing home patients, and for hospitalised patients. Recommendations for severe cases, or if the response is poor, are similar for all categories of patients (see Table II).

If aspiration is suspected, ensure that antibiotics cover for anaerobic organisms. Agents that provide adequate anaerobic cover include amoxicillin-clavulanate, metronidazole and clindamycin. A duration of anti-

**Table II:** Antibiotic therapy for pneumonia in older patients

#### Outpatient and nursing home patients

- Moderately severe pneumonia:
  - High-dose amoxicillin-clavulanate, or second- or third-generation cephalosporin
- Severe pneumonia or poor response to therapy:
  - Add erythromycin, clarithromycin, azithromycin or doxycycline, or use a newer fluoroquinolone with enhanced anti-pneumococcal cover (moxifloxacin or gatifloxacin)

#### Hospitalised patients

- Initial management:
  - Intravenous third-generation cephalosporin or amoxicillin-clavulanate
- Severe pneumonia or poor response to therapy:
  - Add erythromycin, clarithromycin, azithromycin or doxycycline, or use a newer fluoroquinolone with enhanced anti-pneumococcal cover (moxifloxacin or gatifloxacin)

biotic therapy of seven to 14 days is generally recommended, but this may need to be modified according to clinical response and the development of complications.<sup>5</sup>

Tuberculosis or tumour should be suspected in patients who are not responding to standard therapy. Even frail elderly patients tolerate bronchoscopy well and should be referred to a respiratory service if a diagnosis cannot be confirmed. The older patient may be at increased risk for antibiotic-related adverse drug events, which should determine which agent is selected for initial therapy, for example avoiding the use of gatifloxacin in older persons at risk of dysglycaemia.<sup>11</sup> The use of aminoglycoside antibiotics is avoided in the older person.

With rising concerns of an imminent influenza pandemic, the role of the neuraminidase inhibitors zanamivir and oseltamivir may become increasingly important. Current evidence shows that these therapies need to be initiated very early to be effective. Their conferred benefit appears to be that they reduce the time to the alleviation of symptoms by between 0.5 and two days. Additional emerging evidence indicates that they may reduce hospitalisation if given within 48 hours after the onset of symptoms.<sup>12</sup> At present, these agents are not standard care and their cost efficacy has not been determined in the South African setting.

Additional management strategies of importance in an older person with pneumonia are attention to adequate nutrition and hydration, early mobilisation and, if function has declined after the acute phase, referral to a geriatric team for rehabilitation to limit permanent functional loss.

### Prevention strategies

Aspiration can be reduced by measures that involve swallow training, dietary management, positioning and a review of pharmacological treatment the patient may be on. Recently attention has been drawn to excess mortality associated with

neuroleptic medication usage in the older patient.<sup>13</sup> Reasons for these deaths may be dysphagia and a decreased cough reflex induced by a neuroleptic-related impairment of dopamine metabolism.<sup>14</sup> Referral to a speech therapist for evaluation and caregiver training are strongly recommended where aspiration is suspected. Nasogastric or percutaneous gastrostomy feeding tubes do not prevent aspiration and may predispose to it.<sup>6</sup>

Poor oral hygiene with dental plaque colonisation has been shown to be a potential reservoir for organisms that are implicated in pneumonia in the older person. Oral care has been shown to be of benefit in reducing the incidence of pneumonia in elderly nursing-home patients.<sup>6</sup> Dental care should therefore continue to be promoted in older persons, regardless of their care setting.

Vaccination has the potential to reduce hospitalisation and mortality in older persons. Immunosenescence may result in an incomplete antibody response, which causes a lower efficacy of vaccination in the older patient. However, this response is offset by the higher incidence of illness and associated greater morbidity and mortality in these patients.

Vaccination against influenza should be promoted. All older persons may benefit from vaccination, although the greatest benefit occurs in patients with high-risk medical conditions. For all older persons, approximately 100 patients need to be vaccinated against influenza to prevent one all-cause death or hospitalisation. In the higher risk group with chronic comorbidity, the number that need to be treated to prevent one all-cause death or hospitalisation drops to 55.<sup>15</sup> Another influenza vaccination strategy shown to be beneficial is to vaccinate healthcare workers and nursing home staff.<sup>2</sup> Pneumococcal vaccination is controversial, as benefit has been shown in observational studies, but not on a meta-analysis of clinical trials.<sup>16</sup> At present there

is insufficient evidence to dissuade recommending its use.


Since tobacco use increases the risk of pneumonia, all smokers should be given advice and help to cease smoking.

The neuraminidase inhibitors also have a role in prophylaxis against influenza. When used for seasonal prophylaxis in nursing homes, a 92% reduction was found in the incidence of laboratory-confirmed influenza, even though the majority of the residents had received the appropriate vaccination for the season.<sup>12</sup> In the South African context the most cost effective utilization of the neuraminidase inhibitors may be as post-exposure prophylaxis.

### Conclusions

Pneumonia is a common problem in the elderly. A diagnosis is often difficult as symptoms and signs may be atypical. A high index of suspicion and an awareness of the most reliable clinical and laboratory findings will result in the early institution of appropriate therapy and will lessen morbidity and mortality. Effective prevention strategies are available and should be implemented, particularly as the benefit of these strategies is greatest in the older high-risk patient. 📖

See CPD Questionnaire, page 50

 This article has been peer reviewed

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