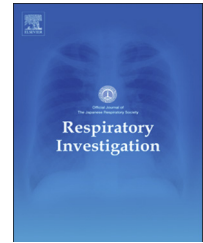




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Review

Update on the pathogenesis and management of pneumonia in the elderly-roles of aspiration pneumonia



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ABSTRACT

Pneumonia in the elderly results in the highest mortality among cases of community-acquired pneumonia (CAP). The pathophysiology of pneumonia in the elderly is primarily due to aspiration pneumonia (ASP). ASP comprises two pathological conditions: airspace infiltration with bacterial pathogens and dysphagia-associated miss-swallowing. The first-line therapy for the treatment of bacterial pneumonia in the elderly is a narrow spectrum of antibiotics, including sulbactam/ampicillin, which are effective against major lower respiratory infection pathogens and anaerobes. The bacterial pathogens of ASP cases of pneumonia in the elderly are similar to those associated with adult CAP. In addition to an appropriate course of antibiotics, pharmacologic and non-pharmacologic approaches for dysphagia and upper airway management are necessary for the treatment and prevention of pneumonia. Swallowing rehabilitation, oral health care, pneumococcal vaccination, gastroesophageal reflux management, and a head-up position during the night are necessary for the treatment and prevention of repeated episodes of pneumonia in elderly patients. In addition, tuberculosis should always be considered for the differential diagnosis of pneumonia in this patient population.

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1. Introduction

Community-acquired pneumonia (CAP) is one of the most frequent infections requiring hospitalization and is a leading cause of mortality in the majority of developed countries [1-3]. Furthermore, the hospitalized CAP mortality rate increases dramatically with age [1-3]. Since pneumonia-related hospitalization and mortality are predominantly associated with older patients, the development of management strategies for pneumonia in the elderly is a priority in clinical infectious medicine and geriatric medicine. Although there are numerous established therapeutic guidelines for CAP, these may not apply to elderly patients [4,5]. However, the Japanese Respiratory Society has published new therapeutic guidelines for pneumonia in the elderly, including nursing- and healthcare-associated pneumonia (NHCAP) [6]. This review summarizes recent advancements in the management of pneumonia in the elderly.

2. Pathogenesis of pneumonia in the elderly: the role of aspiration pneumonia

The dominance of aspiration pneumonia (ASP) in hospitalized CAP and hospital-acquired pneumonia (HAP) among the elderly has been previously reported [7]. Approximately 70% of hospitalized pneumonia cases can be diagnosed as ASP based on the definition determined by Japanese NHCAP and HAP guidelines [6,8]. The ratio of ASP to the incidence of

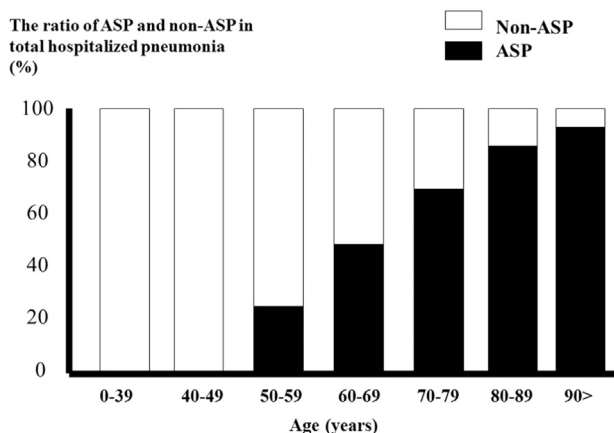


Fig. 1 – Incidence of aspiration pneumonia (ASP) and non-ASP in total pneumonia as a function of age. ASP, aspiration pneumonia; non-ASP, pneumonia without aspiration nor dysphagia [7].

pneumonia increases with age (Fig. 1). ASP comprises two pathological conditions: airspace infiltration with bacterial pathogens and dysphagia-associated miss-swallowing (Fig. 2). Microaspiration of oropharyngeal contents is extremely common in frail elderly patients, including those post-stroke, and can cause small infiltrations of the lung, which then develop into ASP [9-11]. Pneumonia occurring among outpatients in contact with the healthcare system is termed healthcare-associated pneumonia. The incidence of ASP is high in older frail patients and those with healthcare-associated pneumonia [12]. Swallowing function assessment is very important for the diagnosis and management of pneumonia in the elderly. Dysphagia diagnostic methods range from bedside assessments to swallowing videofluoroscopic examinations (Table 1). When performed in elderly patients who require a high level of nursing care, bedside swallowing function assessments and simple swallowing provocation tests may be preferable [13-15].

3. Clinical symptoms and diagnostic difficulty

The signs and symptoms of pneumonia in the elderly differ from the general population. Elderly patients complain of significantly fewer symptoms than younger patients. In some cases, appetite loss, lethargy, conscious disturbances, and delirium are the major symptoms of pneumonia in the elderly [16,17]. Since the majority of elderly patients with pneumonia have two or more co-morbidities, including stroke, ischemic heart disease, and chronic obstructive pulmonary disease, their clinical signs and symptoms may not be specific for pneumonia [17]. The diagnosis of pneumonia in these patients can therefore be difficult in some cases. Furthermore, the prevalence of tuberculosis increases with age and the symptoms of tuberculosis in the elderly often mimic those of pneumonia [18]. Consequently, tuberculosis should always be taken into consideration for the differential diagnosis of elderly pneumonia.

4. Causative pathogens of pneumonia in the elderly

The bacterial pathogens of ASP cases of pneumonia in the elderly are similar to those associated with adult CAP. *Streptococcus pneumoniae* is the most common cause of pneumonia among the elderly, with or without healthcare and nursing (Table 2) [19-28]. *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and enteric gram-negative rods are also important

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