

Elderly Pneumonia and Prognostic Factors

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Abbreviations: CAP-Community-Acquired Pneumonia; HCAP-Healthcare-Associated Pneumonia; PSI-Pneumonia Severity Index; BNP-B-Type Natriuretic Peptide; DM-Diabetes Mellitus

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100-year ago, Doctor William Osler told that pneumonia was the captain of the men of death [1], but nowadays it is not correct in most countries of the world. Acute pneumonia is a common disease for both of young and elderly, but the mortality of elderly pneumonia patients still remains high [2]. It is the similar situation in Japan, pneumonia is the third leading cause of death, and more than 95% is elderly [3]. Many scientific papers relating pneumonia publish every year, and for example PubMed-site reported more than seven-hundred of published research papers for one year, 2016. That suggests elderly pneumonia might have a specific complicated problem different from another kind of infectious diseases. The prediction of outcome of elderly pneumonia could determine the therapeutic indication, length of hospitalization, and the cost. Therefore simple and accurate risk factor is clinical needed. As classifications of the severity of pneumonia, CURB-65 [4] and the PORT-study pulmonary severity index (PSI) [5] show good correlations with pneumonia mortality, and they are well utilized to decide the content of treatment. Unlike younger patients, elderly patients usually have several other diseases at the time of onset of pneumonia [6,7]. The prognosis of elderly pneumonia might be affected by their concomitant diseases, and pneumonia might affect another organ's disorder caused by concomitant diseases. It is possible that elderly pneumonia has various risk factors different from younger pneumonia. In this meaning, elderly pneumonia is realized to be one of systemic diseases, and we should pay attention for not only PSI but also the background of concomitant diseases.

Elderly and Aspiration Pneumonia

Aspiration is defined as the abnormal swallowing of pharyngeal and/or gastric contents into lower respiratory tract, and aspiration pneumonia is also major problem of elderly pneumonia [7], and repeating aspiration would become a trigger of pneumonia. Previously Kikuchi et al reported that silent aspiration occurred more frequently in the Japanese elderly [8], and it is difficult to control aspiration in elderly. To confirm the presence of dysphasia in the patient group without knowing an episode of obvious aspiration, a water-swallowing test, video fluoroscopic swallow assessment, or swallowing provocation test was utilized as previously reported [9,10]. We usually use video fluoroscopic examination. But that takes time and cost, other methods would be conventionally used in most of institutes. Aspiration pneumonia is a heterogeneous disease entity, and repeated microscopic aspiration pneumonia is known as be common among the elderly suffering from cerebral vascular disease and dementia [11]. And repeated aspiration pneumo-

nia may decide the poor prognosis in elderly. In this meaning existence of repeated microscopic aspiration is one of prognostic factors in elderly pneumonia.

Prognostic Factor of Elderly Pneumonia

With increasing of elderly, number of nursing home residents is also increasing. Advanced age itself might be one of prognostic factor of elderly pneumonia [6], and mortality of healthcare-associated pneumonia (HCAP) was worse compared with community-acquired pneumonia (CAP) [12]. Poor functional status (performance status; using the European Cooperative Oncology Group score) was associated with mortality [13]. Among the prognostic factors of elderly pneumonia previously reported, pneumonia severity is the most important factor [4,5]. It is same thing with younger patients. Other than pneumonia severity, low serum albumin level [14], past history of diabetes mellitus (DM) [15], cerebral vascular disease [2,16], dementia [3,16], chronic heart failure [17], malignant disease [18], and chronic obstructive pulmonary disease [17] were known to be associated with poor prognosis in elderly patients. And rapid spread of radiologic infiltrates or bilateral pneumonic infiltrative shadow was associated with pneumonia mortality [19]. Haga T et al reported that bilateral pneumonic infiltration on CT scanning was related to low serum levels of albumin and high serum levels of C-reactive protein [19]. Otherwise, higher serum procalcitonin-value was reported to be associated with poor prognosis [20]. And higher plasma B-type natriuretic peptide (BNP) levels was also reported to be associated with poor prognosis [21]. They might represent the existence of severe bacterial infection or severe heart failure. Recently, we reported that presence of electrocardiogram findings, QTc interval prolongation in pneumonia patients was found to correlate with a poor prognosis [6]. In our analysis, prolonged QTc interval was also associated complication of DM, older age, and lower albumin level. When patients complicated these factors, we could anticipate poor prognosis. But it is difficult to avoid worse prognosis, even if evaluating these factors in advance. There are no previous articles describing or recommended to change the content of treatment depending on these conditions in elderly pneumonia.

Treatment of Elderly Pneumonia and Future Direction

From the point of above description and to decrease pneumonia mortality, preventing occurrence of pneumonia or deterioration of pneumonia is the most effective therapeutic strategy. In other words, they are as following; decreasing the number of complicated prognostic factors, controlling concomitant diseases, prevention of aspiration incident, pneumonia prevent by vaccination, early starting administration of antibiotics, and providing antibiotics treatment based on pneumonia therapeutic guideline. In spite of accumulation of knowledge, real practice of above points is very difficult, and the outcome is still unsatisfied. 100 years later, the future clinician, Doctor

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William Osler of the future might tell us that there were few people dying of elderly pneumonia. Although mortality of elderly pneumonia is still remained high, the important thing so far might be that clinicians could treat the patient with having recognition of elderly pneumonia as a systemic disease. Comprehensive medical care under the recognition as a systemic disease would be necessary.

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