Reappraisal of Clindamycin IV Monotherapy for Treatment of Mild-to-Moderate Aspiration Pneumonia in Elderly Patients*

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Background: **As the number of elderly people has increased in Japan, the occurrence of aspiration pneumonia has also increased. Guidelines for the treatment of pneumonia have been proposed, in which the use of antibiotics, such as β-lactam plus β-lactamase inhibitor, clindamycin, and carbapenem, has been recommended as effective against anaerobic bacteria in the treatment of aspiration pneumonia. However, to our knowledge, a prospective comparison of these antibiotics regarding their clinical efficacy in aspiration pneumonia has not been performed.**

Study objectives: **We compared the effects of IV administration of a half dose of ampicillin/sulbactam (SBT/ABPC), normal dose of SBT/ABPC, IV clindamycin, and IV panipenem/betamiprom (PAPM/BP) for treatment of mild-to-moderate aspiration pneumonia in elderly patients.**

Design: **Randomized prospective study.**

Patients: **One hundred adult patients with compatible signs and symptoms of aspiration pneumonia.**

Assessments: **Patients were assessed before, during, and after treatment regarding symptoms, as well as results of laboratory values, chest radiograph examinations, and sputum bacterial cultures.**

Results: **We found few differences between the groups regarding cure rate, duration of IV medication, and occurrence of adverse effects with the tested therapies. However, clindamycin therapy was less expensive and was associated with a lower rate of posttreatment occurrence of methicillin-resistant *Staphylococcus aureus*.**

Conclusions: **Clindamycin therapy for mild-to-moderate aspiration pneumonia is clinically effective, and provides economic advantages as compared to SBT/ABPC or PAPM/BP therapy.**

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Key words: ampicillin/sulbactam; aspiration pneumonia; clindamycin; medical cost; methicillin-resistant *Staphylococcus aureus*; panipenem/betamiprom; prospective clinical study

Abbreviations: CRP = C-reactive protein; IDSA = Infectious Diseases Society of America; MRSA = methicillin-resistant *Staphylococcus aureus*; PAPM/BP = panipenem/betamiprom; PBP = penicillin-binding protein; PORT = Patient Outcome Research Team; SBT/ABPC = ampicillin/sulbactam

In Japan, pneumonia is the fourth-leading cause of death in elderly people. As the number of elderly people has increased, the occurrence of aspiration pneumonia has also been increasing. Kikuchi et al[1] reported that silent aspiration in the elderly with an acute episode of pneumonia occurred more frequently (70%) than in control subjects (10%).

Bartlett et al[2] prospectively studied 54 cases of pulmonary infection following aspiration and concluded that anaerobes that normally colonize the oral cavity play a key role in most cases of aspiration pneumonia. Furthermore, it is not uncommon for anaerobic bacteria to be resistant to a number of β-lactam antibiotics because of the production of β-lactamase.[3] Therefore, it has been recommended that antibiotics such as a β-lactam plus β-lactamase inhibitor, clindamycin, and carbapenem should be used, each of which are effective against anaerobic bacteria.[4–6] However, to our knowledge, the effi-

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cacy, bacteriologic effects, and adverse effects of these antibiotics have not been compared prospectively. We studied patients who received an administration of a β-lactam plus β-lactamase inhibitor (ampicillin/sulbactam [SBT/ABPC]), clindamycin, or carbapenem (panipenem/betamiprom [PAPM/BP]) who had mild-to-moderate aspiration pneumonia.

Materials and Methods

Patients

One hundred patients aged 71 to 94 years were studied between July 2000 and October 2003. These patients were hospitalized in Fukui or Ishikawa Prefecture in Japan and had mild or moderate aspiration pneumonia. The majority of the enrolled patients were nursing home residents. The diagnosis of aspiration pneumonia was made based on symptoms of fever, cough, and purulent sputum, as well as observed aspiration and a predisposition to aspirate due to dysphagia, and the results of blood analyses and radiographic examinations, such as chest radiograph and CT imaging, which revealed characteristic images compatible with aspiration pneumonia in the posterior segments of the lower lobes.[6–7] Clinical signs suggesting the presence of dysphagia were delayed swallowing, coughing or choking before, during, and after swallowing, and decreased oral/pharyngeal sensation.[8] Chemical aspiration pneumonitis that occurred after apparent vomiting was excluded.[7] The severity was graded by criteria for pneumonia established by the Japan Society of Chemotherapy,[9] which included body temperature, chest radiograph score (Table 1, Fig 1), WBC count, and C-reactive protein (CRP) [Table 2].[9] Applying to the classification of community-acquired pneumonia by the American Thoracic Society[10] or that by the Infectious Disease Society of America (IDSA),[6] our patients were designated to group 3 and class IV, respectively.

Exclusion Criteria

Patients with severe pneumonia, severe complications, and known allergies to the tested antibiotics, as well as those who had received other antibiotic therapy within 1 month prior to enrollment, were excluded. Informed consent was obtained from all patients prior to their participation.

Table 1—*Scoring Criteria for Pneumonia Based on Chest Radiograph Findings of Area of Involvement**

Pneumonia score	Area of Involvement
0	No abnormal infiltrates
1	Very small infiltrates limited to one intercostal site
2	Between one and three intercostal sites
3	Infiltrate involving one tenth of one lung
4	Between three and five intercostal sites
5	Infiltrate involving one third of one lung
6	Between five and seven intercostal sites
7	Infiltrate involving two thirds of one lung
8	Infiltrate involving nearly one entire lung
9	Between eight and ten intercostal sites
10	Infiltrates involving nearly completely both lungs

*From Saito et al.[9]

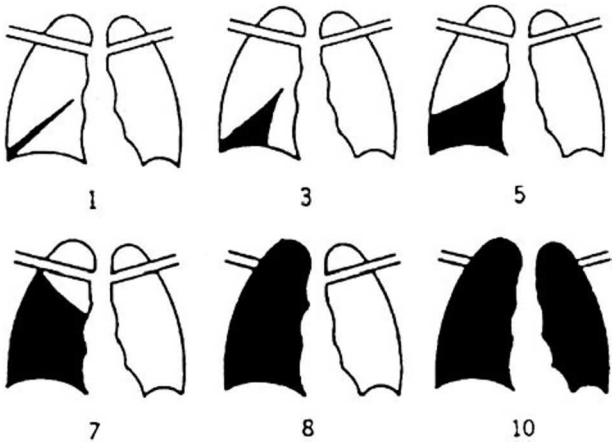

Figure 1. Scoring criteria for pneumonia based on chest radiograph findings of area of involvement.[9]

Study Design

Following enrollment, the patients were randomly assigned to one of four IV treatment regimens. After beginning the study, two younger and three older patients were excluded because of age limitation, while one patient was admitted for a different disease (colon cancer). Patients in group 1 received a half dose of SBT/ABPC (1.5 g bid), those in group 2 received a normal dose of SBT/ABPC (3 g bid), those in group 3 received clindamycin (600 mg bid), and those in group 4 received PAPM/BP (0.5 g bid). Randomization was achieved by sealed envelopes, and the balance among groups was achieved by block randomization. When the number of patients reached 25 in each treated group, we preliminarily analyzed the results. Since we found methicillin-resistant *Staphylococcus aureus* (MRSA) in three of the treatment groups but not in the clindamycin group, we decided to discontinue the study early.

Assessments

We assessed the results by focusing on five parameters: healing effect, occurrence of adverse effects, duration of IV medication, new appearance of antibiotic-resistant bacteria, and antibiotic cost. The healing effect was determined by assessing body temperature, chest radiograph score, WBC count, and CRP (Table 3).[9] Those examinations were performed on day 1 (just prior to beginning therapy), day 3, day 7, and in some cases day

Table 2—*Evaluation of Severity of Infection in Pneumonia**

Parameters	Severity of Disease		
	Mild†	Moderate‡	Severe§
Body temperature, °C	< 37.5		≥ 38.6
Number of infiltrates on chest radiograph	< 4		≥ 6
Peripheral WBC count, μL	< 1,000		≥ 15,000
CRP, mg/dL	< 4.0		≥ 10.0

*From Saito et al.[9]
†Satisfies one or more of the defined criteria.
‡Cases that are neither mild nor severe.
§Satisfies three or more of the defined criteria.