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## Original article

Effect of feeding management on aspiration pneumonia in elderly patients with dysphagia<sup>☆</sup>Min Li, Zheng Wang<sup>\*</sup>, Wei-Jia Han, Shi-Yin Lu, Ya-Zhen Fang

Geriatric Ward, Huadong Hospital Affiliated to Fudan University, Shanghai 200040, China

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## ABSTRACT

**Objective:** To investigate the effects of feeding safety instructions and dietary intervention on aspiration pneumonia in elderly patients with dysphagia.

**Methods:** The study included 40 long-term hospitalized elderly patients with dysphagia who needed oral intake. According to the voluntary and matching principle, participants were divided into the intervention group ( $n = 20$ ) and control group ( $n = 20$ ). We formed a multi-disciplinary team including clinical nurses, rehabilitation therapists and nutritionists. Clinical nurses collaborated with nutritionists and rehabilitation therapists to carry out feeding management. The patients in the control group were fed with semi-solid food, thick liquid, a partial mushy diet and so on according to their swallowing situations and tastes or preferences. The patients in the intervention group were fed with an all mushy diet. Patients in both groups were able to eat foods on their own or with assistance.

**Results:** After a three-month intervention, the incidence of aspiration pneumonia in both groups was decreased, and the difference was statistically significant ( $P < 0.05$ ). In the control group, seven patients had aspiration pneumonia, including two cases who died after nasogastric feeding due to aggravated dysphagia. In the control group, seven patients had aspiration pneumonia, including two cases who were given nasogastric feeding due to aggravated dysphagia and then one case died. In the intervention group, four patients had aspiration pneumonia. There was no dropouts in either group.

**Conclusions:** Elderly patients with dysphagia require a multidisciplinary team to work closely with them to carry out feeding management. Nurses should conduct safety guidance for care catering and encouraging patients to actively eat a mushy diet. The diet can reduce the incidence of aspiration pneumonia, maintain oral intake and improve the quality of life.

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## 1. Introduction

Dysphagia, also known as swallowing disorders, is due to the lower jaw, lips, tongue, soft palate, throat, esophagus or esophageal sphincter function impaired. People with dysphagia cannot put food from the mouth to the stomach safely and effectively to get adequate nutrition and water feeding is difficult.<sup>1</sup>

A questionnaire was given to 931 senior citizens who live in nursing home in the Shanghai area. The survey showed that the

incidence of dysphagia for 80–89 years olds, 90–99 year olds and 100 year old and older segment was 35.6%, 43.7%, and 50%, respectively.<sup>2</sup> In addition, the incidence of dysphagia rises with increasing age. Aspiration is the most common complication. It can cause recurrent aspiration pneumonia and even asphyxia, which are life threatening. Japanese researchers<sup>3</sup> found that pneumonia was the third cause of death in elderly over 65 years of age and was the first cause in elderly over 85 years of age and older, of which more than 60 percent was caused by dysphagia. It is predicted that Chinese senior citizens over 80 years of age will reach 24 million in the “Twelfth Five-Year Plan” period. Although domestic dysphagia rehabilitation work has been carried out, professional speech therapists and physical therapists are still lacking. This study was carried out to evaluate feeding management through the formation of multi-disciplinary teams. We provided diet safety instructions

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<sup>\*</sup> Corresponding author.

E-mail address: [liu\\_xu0028@sina.com](mailto:liu_xu0028@sina.com) (Z. Wang).

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and dietary intervention to elderly patients with dysphagia and observed the occurrence of aspiration pneumonia.

## 2. Material and methods

### 2.1. Participants

We selected long-term hospitalized elderly patients in the geriatric ward in Huadong Hospital between March 2011 and September 2012 who needed oral intake of foods and drinks. The inclusion criteria were: (1) A known case of dysphagia diagnosed by specialists based on the Standardized Swallowing Assessment (SSA)<sup>4</sup>; (2) mild-to-moderate dysphagia as assessed by Caiteng's rating method (divided into seven levels; level 7 was normal, level 6 were mild, level 3–5 were moderate, level 1–2 were severe); and (3) stable disease. The exclusion criteria were: (1) Severe malnutrition; (2) acute phase of lung infections and gastrointestinal diseases. This study evaluated a total of 95 cases of elderly patients and found 68 cases (71.6%) had dysphagia. After patients signed informed consent, 20 cases were assigned into the intervention group. Then, we chose another 20 cases from those who met the inclusion criteria to form a control group according to the matching principle. Patients in both groups had a similar age, gender, underlying diseases, dietary habits, degree of dysphagia and other basic characteristics. There was no significant difference between the intervention and control groups in clinical data ( $P > 0.05$ , Table 1).

### 2.2. Methods

#### 2.2.1. Formation of a multi-disciplinary team<sup>5</sup>

Our team included two rehabilitation technicians, one administrative dietitian, ten primary care nurses and one resident physician. ① Training for team members: Our team members were trained by rehabilitation technicians and administrative dietitians on a rating scale of SSA and related knowledge of dysphagia. ② The mission of the team members is clear-cut and involves collaboration. After nurses confirmed patients with dysphagia, they informed rehabilitation technicians to perform a further evaluation based on Caiteng's rating method. We held the first official case discussion and invited patients' family members to participate. In the discussion, rehabilitation technicians decided the appropriate swallowing function training for patients according to their swallowing function and explained the relevant considerations. The dietitian was responsible for nutrition management and guidance; they also determined the types, properties and quantity of food. The resident physician assessed the disease and then provided

summaries and decided the clinical treatment guidelines. Nurses played a role in keeping the patient's mouth clean and providing safe eating education. They also assisted patients to take food and gave patients' families eating guidance. Nurses assessed patients' feeding status and informed the resident physician and rehabilitation technicians when they found something abnormal. Then, the resident physician and rehabilitation technicians reassess the patients. Families provided mental support and observed the patients in a non-treatment period.

#### 2.2.2. Screening

Cichero, et al<sup>6</sup> considered that nurses are the professionals who contact patients most frequently, so they are fully capable of screening for dysphagia. In this study, two highly qualified nurses assessed the patients' dysphagia situation based on the Standardized Swallowing Assessment Scale (SSA). The contents were assessed from easy to difficult according to three steps. First, the nurse checked the patient's consciousness, postural control and structural functions of lips, tongue, pharynx, and so on. Second, patients were asked to perform the drink-water test, in which the volume of water was gradually increased from 5 ml to 60 ml. If any step of the test appeared abnormal, the test was immediately terminated and the patients were diagnosed with dysphagia. Ma et al<sup>7</sup> thought that the SSA was reliable and valid for assessing swallowing function in elderly patients. It is suitable for bedside assessment, and its simple process significantly reduces the risk of a large number of aspirations during the examinations.

#### 2.2.3. Diet safety instructions

Detailed management of oral intake can effectively reduce the incidence of aspiration and other complications in elderly patients with dysphagia and improve patient quality of life.<sup>8</sup> Helping and guiding elderly patients to eat safely is a nursing intervention that requires professional nursing knowledge and skills. Although it has not received enough attention in China, the UK Department of Health used it as a criterion to assess nurses' work.<sup>9</sup> Referring to "The Basis of Elderly Care and Technology", which was compiled by Ma,<sup>10</sup> our team members all participated in the production of an education handbook titled "Diet Safety Instructions in Elderly Patients". It was used to provide specific guidance to patients and primary caregivers in both groups. Nurses assessed the patients' general state and feeding status before eating and observed the six eating steps closely: (1) Maintain eating posture; (2) see food; (3) eat food with tableware; (4) place food into the mouth; (5) chew; and (6) swallow. The patients needed help if any one of the above could not be finished independently.<sup>11</sup>

**Table 1**

The clinical data of the two groups of patients [cases (%)].

Items	Intervention group (n = 20)	Control group (n = 20)	P
Gender, male	16 (80.00)	17 (85.00)	1.000
Age (years)	92.75 ± 5.07	92.50 ± 4.94	0.875
Coronary heart disease	18 (90.00)	18 (90.00)	1.000
Hypertension	20 (100.00)	17 (85.00)	0.230
Cardiac dysfunction	15 (75.00)	13 (65.00)	0.490
COPD	7 (35.00)	5 (25.00)	0.490
Respiratory failure	3 (15.00)	1 (5.00)	0.598
Brain dysfunction	13 (65.00)	8 (40.00)	0.113
Stroke (stroke sequelae)	12 (60.00)	14 (70.00)	0.507
Parkinson's disease	1 (5.00)	1 (5.00)	1.000
Diabetes	6 (30.00)	6 (30.00)	1.000
Caiteng's rating method			
3	8 (40.00)	7 (35.00)	0.393
4	8 (40.00)	8 (40.00)	
5	2 (10.00)	4 (20.00)	
6	2 (10.00)	1 (5.00)	

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