National survey of the prevalence of swallowing difficulty and tube feeding use as well as implementation of swallowing evaluation in long-term care settings in Japan

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Aim: The present study was carried out to clarify tube feeding utilization and the prevalence of swallowing difficulty among residents in geriatric long-term settings, and to elucidate the implementation of swallowing assessment at four different types of facilities in Japan.

Methods: We mailed a questionnaire to a total of 4334 facilities.

Results: We received responses from 1137 (26.2%) facilities, including 440 (29.0%) from 1517 nursing homes, 275 (29.2%) from 941 long-term care facilities, 205 (18.1%) from 1134 sanatorium medical facilities and 217 (29.2%) from 742 rehabilitation facilities. The number of tube-fed residents per 100 beds in each facility was 11.6 at the nursing homes, 7.4 at the long-term care facilities, 36.3 at the sanatorium medical facilities and 7.9 at the rehabilitation facilities. The number of residents per 100 beds with swallowing difficulty was 23.7 in the nursing homes, 15.6 in the long-term care facilities, 19.2 in the sanatorium medical facilities and 15.4 in the rehabilitation hospitals. The percentages of facilities that assessed swallowing difficulty were 31.8% of the nursing homes, 63.0% of the long-term care facilities, 77.9% of the sanatorium medical facilities and 91.7% of the rehabilitation hospitals.

Conclusion: A large number of residents using a feeding tube and with difficult swallowing were observed in geriatric long-term settings without adequate evaluation of swallowing function. Geriatr Gerontol Int 2014; 14: 577–581.

Keywords: long-term care facilities, swallowing difficulty, tube feeding.

Introduction

It is generally believed that a large percentage of geriatric residents have swallowing difficulties and/or nutritional problems. According to a 1996–1999 study of over 90% of randomly selected geriatric facilities in Japan, more than 40% of the residents were malnourished.1 However, approximately 30% of the malnourished residents were able to improve their nutrition within 3 years.1 Numerous studies have shown that poor nutritional status as well as swallowing difficulty was strongly correlated with poor outcomes in the elderly, including hospital administration and mortality.2–4 Swallowing difficulty might also lead geriatric residents/patients to undernutrition/dehydration and aspiration pneumonia. These comorbidities increase residents/patients risks for hospital admission and feeding tube placement. Tube feeding (including percutaneous endoscopic gastrostomy [PEG] tube feeding) has become the most widely used method for long-term enteral feeding of patients or residents with swallowing difficulty or inability to take sufficient food by mouth. However, reviews of the relevant literature have questioned the benefits of tube-feeding individuals with special conditions, such as advanced dementia.5–6 Feeding tubes have not been found to improve survival, prevent aspiration...
pneumonia, heal decubitus ulcers, or contribute to other important health outcomes.5,6

Relative to the clinical significance of swallowing difficulty and tube feeding use for older adults requiring care, reliable data to date has been lacking in Japan, a country with a sizable and growing older population. In addition, despite the impact of swallowing disorders in old age, available information on the implementation of swallowing evaluation has also been sparse. Under the circumstances, we carried out a national survey to investigate the prevalence of swallowing difficulty and tube-feeding use as well as implementation of swallowing evaluation in various long-term care settings.

Methods

Data collection

We randomly selected 4334 facilities according to facility size and region within Japan using randomized sampling of three subpopulations. The selected facilities included 1517 nursing homes, 941 long-term care facilities, 1134 sanatorium medical facilities and 742 rehabilitation hospitals. We excluded facilities with fewer than 30 residents. Full-time dietitians at the facilities were asked to complete the questionnaire. If none was present, a registered nurse or other medical staff completed the questionnaires. Completed questionnaires were mailed back to us from 1 September to 30 October 2009. Written informed consent for participation was obtained from the participants, dietitians/medical staff, or, for those with substantial cognitive impairment, from a surrogate (usually the closest relative or legal guardian) according to procedures approved by the institutional review board of Kanagawa University of Human Services.

Parameters

We collected data from the standardized questionnaires: a brief description of the facility (census, mean number of patients/residents, number of dietitians employed) and the demographic characteristics of the patients/residents currently admitted. Data were also obtained from the staff regarding the number of patients/residents who were using feeding tubes and who were potentially transitioning from tube feeding to oral intake, and patients/residents with swallowing problems. In addition, we also asked whether they were carrying out the swallowing evaluation of the patients/residents, and the assessment methods they used (water swallowing test, conventional checking sheet, modified water swallowing test, cervical auscultation, food test, repetitive saliva swallowing test, videofluoroscopic examination of swallowing, fiberoptic endoscopic examination of swallowing, ice chip swallowing test, ultrasonography, other physical diagnosis, others).

Terminology

The term “resident” used for the remainder of the present article will signify both residents of and patients at the geriatric-care facilities surveyed.

1 Tube-fed resident: A resident using a nasogastric tube or PEG tube with or without oral intake.

2 Resident who was potentially transitioning from tube feeding to oral intake: a resident using tube feeding who is hemodynamically stable, alert, lucid, has a positive swallowing reflex and does not choke when swallowing saliva.

3 Resident with swallowing difficulty: a resident with oral feeding who uses a thickened liquid diet, who chokes with meal intake, and has a current or past history of aspiration pneumonia and swallowing problems.

Statistical analysis

To compare the groups’ facilities, we used the analysis of variance (one way ANOVA) test and $\chi^2$-test (residual analysis) as appropriate. SPSS version 17.0 J for Windows (SPSS Japan 122, Tokyo, Japan) was used for the statistical analysis.

Results

The mean proportions of tube-fed patients/residents ranged from 7.4% to 36.3%, with the highest proportion found in patients admitted to sanatorium types of medical facilities. By contrast, only small numbers of residents (0.5–2.6) who were potentially transitioning to oral intake per 100 beds were observed in the various facilities. When we calculated the mean numbers of cases per 100 tube-fed patients/residents, 4.7–9.0 residents fulfilled these conditions, except for rehabilitation hospitals in which 37.6 per 100 tube-fed patients were potentially transitioning to oral intake. In addition, we also observed the high prevalence of swallowing difficulties with 15.4–23.7% among oral-fed residents (Table 1).

The implementation rate of swallowing evaluation varied from 31.8% in nursing homes to 91.7% in rehabilitation hospitals (Table 2). The various swallowing evaluation tests were used in geriatric facilities. Most of the nursing homes used clinical examinations, such as water swallowing tests. Instrumental examinations, more objective evaluation of swallowing, such as videofluoroscopic examination of swallowing and fiberoptic endoscopic evaluation of swallowing, were mainly used at rehabilitation hospitals, and not used at most of the nursing homes and long-term care facilities (Table 2).
Table 1  Facility demographics and numbers of residents who are tube-fed, transitioning to oral intake, or swallowing difficulties

|                      | Nursing homes (n = 440) | Long-term care facilities (n = 275) | Sanatorium medical facilities (n = 204) | Rehabilitation hospitals (n = 217) | P* |
|----------------------|-------------------------|------------------------------------|----------------------------------------|-----------------------------------|----|
| No. beds in the facility | 439 (70.9 (26.7)       | 274 (91.6 (25.4)                   | 198 (81.6 (78.7)                     | 210 (63.8 (37.0)                  | <0.001 |
| Mean age (years)      | 423 (85.9 (1.9)        | 270 (84.8 (2.0)                   | 183 (80.8 (3.8)                      | 186 (74.4 (4.8)                   | <0.001 |
| No. tube-fed patients per facility | 440 (7.8 (5.8)    | 275 (6.7 (6.7)                   | 204 (32.1 (36.1)                    | 217 (5.3 (6.3)                    | <0.001 |
| No. patients who were potentially transitioning to oral intake per 100 beds | 440 (11.6 (8.5) | 275 (7.4 (7.0)                   | 204 (36.3 (22.7)                    | 217 (7.9 (7.4)                    | <0.001 |
| No. residents with swallowing difficulties among orally-fed residents per facility | 407 (16.4 (13.2) | 275 (14.5 (14.1)                  | 204 (14.4 (24.1)                    | 217 (9.9 (12.7)                   | <0.001 |
| No. residents with swallowing difficulties among orally-fed residents per 100 beds | 406 (23.7 (17.0) | 274 (15.6 (13.9)                  | 203 (19.2 (24.7)                    | 213 (15.4 (15.9)                  | <0.001 |

*P-values: one-way ANOVA.

Table 2  Implementation of assessment methods to address swallowing problems in elderly residents and patients

|                      | Nursing homes (n = 440) | Long-term care facilities (n = 275) | Sanatorium medical facilities (n = 204) | Rehabilitation hospitals (n = 217) |
|----------------------|-------------------------|------------------------------------|----------------------------------------|-----------------------------------|
| Implementation of swallowing evaluation assessment method | 127 (31.8) | 162 (63.0) | 148 (77.9) | 199 (91.7) |
| Water swallowing test | 109 (24.8) | 138 (50.2) | 109 (53.4) | 150 (69.1) |
| Conventional [check sheet] | 102 (23.2) | 114 (42.5) | 131 (64.2) | 171 (78.8) |
| Modified water swallowing test | 64 (14.5) | 108 (39.3) | 119 (58.3) | 184 (84.8) |
| Cervical auscultation | 57 (13.0) | 91 (33.1) | 109 (53.4) | 177 (81.6) |
| Food test | 50 (11.4) | 83 (30.2) | 123 (60.3) | 177 (81.6) |
| Repetitive saliva swallowing test | 41 (9.3) | 103 (37.5) | 135 (66.2) | 195 (89.9) |
| Video fluoroscopic examination of swallowing | 29 (6.6) | 38 (13.8) | 81 (39.7) | 170 (78.3) |
| Fiberoptic endoscopic examination of swallowing | 22 (5.0) | 17 (6.2) | 27 (13.2) | 60 (27.6) |
| Ice chip swallow test | 15 (3.4) | 26 (9.5) | 56 (27.5) | 83 (38.2) |
| Ultrasonography | 8 (1.8) | 2 (0.7) | 10 (4.9) | 8 (3.7) |
| Other physical diagnosis | 75 (17.0) | 60 (21.8) | 44 (21.6) | 49 (22.6) |
| Others | 11 (2.5) | 17 (6.2) | 8 (3.9) | 9 (4.1) |

χ²-test (a vs b vs c vs d. †Standardized residual |r| > 2.58, P < 0.01; |r| > 1.96, P < 0.05). *P < 0.05, **P < 0.01 (residual analysis).
Discussion

The present data were not influenced by the region within Japan or the facility size. In the present study, we observed that the number of tube-fed residents per 100 beds in each facility was 11.6 at the nursing homes, 7.4 at the long-term care facilities, 36.3 at the sanatorium medical facilities and 7.9 at the rehabilitation facilities. The total numbers of beds (including facilities with fewer than 30 residents) for all of Japan were reported to be 432,900 in nursing homes, 308,233 in long-term care facilities, 332,986 in sanatorium medical facilities and 63,373 in rehabilitation hospitals. Based on these data, and the mean numbers of tube-fed residents per 100 beds from the present results, we estimated the number of tube-fed residents in Japan to be 50,216 in nursing homes, 22,809 in long-term care facilities, 120,874 in sanatorium medical facilities and 5006 in rehabilitation hospitals.

The prevalence of tube feeding among nursing home residents varies between countries and even among regions in one country. It has been reported that the prevalence of PEG tubes among nursing home residents with advanced cognitive impairment in the USA varies from 18% to 34% nationally, with substantial within-state variation from 7.5% to 40%. In Italy, an average of 6.6% of nursing home residents were tube fed. A nationwide survey in Germany showed that 6.6% of nursing home residents received tube feeding. A report from Taiwan showed that 29.2% of residents in long-term care facilities were fed by tube. A large 2010 survey by the All Japan Hospital Association revealed that the prevalence of PEG feeding was 8.8%, 7.2% and 29.6% in nursing homes (data from 387 nursing homes), long-term care facilities (251 facilities), and sanatorium medical facilities (210 facilities), respectively. These results are similar to the results of the present study.

Only a limited number of studies of the prevalence of swallowing difficulty in individuals living in geriatric settings have been reported. In Taiwan, the prevalence rate for impaired swallowing was estimated to be 31.9% for non-tube-fed residents in long-term care facilities. In nursing homes in Helsinki, Finland, 14.5% of the residents had swallowing difficulty. We observed that the prevalence of swallowing difficulty among orally-fed participants at various geriatric settings ranged from 15.4% to 23.7%. We might have underestimated the number of residents with difficulty swallowing. This could be due to the low rate of swallow test implementation in the facilities. The residents with swallowing difficulty seem to have a high risk of not only life-threatening events, such as aspiration pneumonia and suffocation, but also feeding-tube placement without the appropriate interventions.

To our knowledge, no other studies so far with large sample sizes have determined the number of older residents who are potentially transitioning from tube feeding to oral intake together with the numbers of orally-fed residents with difficulty swallowing in long-term care settings. The present study identified fewer residents who were potentially transitioning from tube feeding to oral intake in nursing homes and long-term care facilities where high levels of care are required, because residents in those facilities are less likely to meet the four criteria established by the study (hemodynamically stable, arousal without stimulation, positive swallowing reflex and does not choke when swallowing saliva). Again, we might have underestimated the number of these residents because of the low rate of swallow test implementation in the facilities.

In fact, we found that just 31.8% of the nursing homes that responded to the present survey carried out swallow evaluations, although there were many residents with swallowing difficulty in the facilities. In addition, only a few nursing homes used videofluoroscopic examination of swallowing or fiberoptics endoscopic evaluation for the swallow test. It is possible that many nursing homes do not have access to facilities that provide such evaluations. The lack of the adequate evaluations of swallowing abilities of the nursing home residents could reduce the chances of transitioning from tube feeding to oral intake and maintaining oral intake, and facilitate tube insertion as means of feeding.

The present study had potential limitations. First, the recovery rate for the questionnaire was fairly low; and second, there could be a participation bias for institutions with a special interest in nutritional care. Third, we surveyed the prevalence of total tube feeding, and did not distinguish PEG tube feeding and other feeding tube methods, such as a nasogastric feeding tube. The strength of the present study was that our data were not influenced by the region within Japan or the facility size, as we randomly selected facilities according to facility size and region within Japan.

In conclusion, we found that a relatively large number of residents with feeding tube use and with difficult swallowing among orally-fed residents were observed in geriatric long-term settings. In addition, we also showed that a limited swallowing evaluation of the residents, especially among nursing homes, is common, suggesting that many of the residents have life-threatening events risks without appropriate evaluations of the swallowing ability, and that there are residents who lose the chance of transitioning from tube feeding to oral intake, or who lead to feeding tube placement because of the lack of adequate swallowing evaluations and interventions. A swallowing evaluation system should be implemented, and efforts should be made to improve patient swallowing capabilities so that adequate nutrition –
and thus improved health – are maintained in elderly patients at long-term care facilities.

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Disclosure statement

The authors declare no conflict of interest.

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