BENEFITS OF CLUSTER NURSING BASED ON COMPREHENSIVE EVALUATION OF SWALLOWING FUNCTION AND NEUROLOGICAL IMPAIRMENT IN ELDERLY PATIENTS WITH DYSPHAGIA

Xiuzhen Jiang, Liying Ma, Ying Wu, Lanmei Du

People's Hospital of Inner Mongolia Autonomous Region, Hohhot , China

Authors' name：Xiuzhen Jiang

Correspondence autuor: Liying Ma
Ying Wu Email: Hasi_nmgrmyy@outlook.com,
Lanmei Du

ABSTRACT

Background This study assesses the effect of cluster nursing based on a comprehensive evaluation on the swallowing and nerve function of elderly patients with swallowing disorders.

Method Ninety-two elderly patients with stroke dysphagia, diagnosed and treated in the geriatric medical center of the hospital from July 2021 to January 2022, were observed and analyzed. They were randomly divided into two groups of 46 each: a control group receiving routine nursing and an observation group receiving cluster nursing. Before and after nursing, the impairment of neurological function, quality of life and swallowing ability of the two groups were evaluated by the National Institute of Health Stroke Scale (NIHSS), quality of life scale (QOL) and Water swallowing test (WST).

Results (1) After nursing, the quality of life scores of both groups were improved compared to before nursing. There was a significant difference in the scores of the observation group before and after nursing ($P < 0.05$); after nursing, the quality of life scores of elderly patients in the observation group were higher than those of the control group ($P < 0.05$). After nursing, the NIHSS scores of the two groups of elderly patients decreased, and the difference between the observation group before and after nursing was statistically significant ($P < 0.05$); the NIHSS score of elderly patients in the observation group after nursing was also lower ($P < 0.05$). (2) The improvement effect on dysphagia symptoms in the observation group was greater than in the control group ($P < 0.05$).

Conclusion The effect of cluster nursing based on comprehensive evaluation of the improvement of symptoms in elderly patients with stroke swallowing disorder is superior to that of routine nursing, which is conducive to significantly improving neurological impairment, swallowing disorder symptoms and improving quality of life.

Keywords Cluster nursing；Dysphagia；Stroke；Aging；Depression test

Introduction

Stroke is a cerebrovascular disease with a high rate of incidence that frequently results in disability or death. Stroke, dementia, brain trauma and other diseases are often accompanied by dysphagia, the most common of which is stroke [1]. The number of patients with dysphagia after stroke accounted for 16.00%–60.40% of the total number of patients [2]. Liu Wenwen [3] studied stroke patients with swallowing fluorescence imaging tests, and 81% of patients exhibited dysphagia between 10 and 75 days post-onset. Swallowing is a complex physiological reflex process in the human body. When dysphagia occurs, physiological reflex disorder may lead to aspiration of the lower respiratory tract and cause pneumonia, which seriously threatens the health of patients, especially the elderly. As bodily functions decline with age, the difficulty of disease treatment increases. Combined with swallowing dysfunction, it can lead to oropharyngeal and gastric material reflux that affects the vocal cords and aspiration. If pathogenic bacteria are in the inhaled food and secretions, life-threatening adverse reactions may result.

Dysphagia is also an independent risk factor for malnutrition [4], and the probability of malnutrition in dysphagia cases is 6.1% ~ 62.0% [5]. This is reflected in many studies, such as Zhang Xiaoyan's nutritional screening of patients with dysphagia after acute stroke, which found that compared with 11.7% of patients without dysphagia, the incidence of malnutrition in patients with dysphagia was as high as 34.8%. Dysphagia hampers effective swallowing of food because of abnormal functionality of the lip and soft palate, jaw, throat, esophageal sphincter and esophagus, which lead to great difficulty in absorbing nutrients from food. This lack of nutrition can reduce the elderly individual's immune function, and increase the chance of infection, the incidence of frailty, and the risk of stroke [6]. Patients are often exhibit unclear pronunciation, laborious breathing and deficiency of water and electrolytes [7].

Elderly patients with dysphagia usually receive nursing intervention. However, routine care is unideal because it is not personalized [8]. Cluster nursing is an evidence-based method that effectively integrates various effective and scientific nursing methods to ensure that patients can obtain better care, helping mitigate the occurrence of nursing risk events and improving the quality of clinical nursing[9]. Accordingly, this study analyzed in detail the effects of cluster nursing on the neurological function, quality of life and swallowing ability of elderly stroke patients with dysphagia provided with cluster nursing.

Materials and Methods

Participants

The subjects of this observation were 92 elderly patients with dysphagia following stroke who were admitted to the geriatric medical center from July 2022 to July 2023. The control group included 28 males and 18 females, aged 65–84 years old, mean (72.00 ± 3.80) years old; the course of disease was 5–20 days, with an average of (7.80 ± 2.50) days. The observation group consisted of 27 males and 19 females, aged 65–82 years old, mean (71.70 ± 4.00) years old; the course of the disease was 6–19 days, with an average of (8.00 ± 2.20) days. No statistically significant difference was found between the two groups of elderly patients in terms of basic data such as

gender, age and course of disease (P > 0.05), providing an ideal basis of comparison. Informed consent was signed by the patient's family before the research, and the study was reviewed and approved by the Medical Ethics Committee.

Inclusion and exclusion criteria

Inclusion criteria: (1) Condition confirmed by transcranial magnetic resonance imaging (MRI) / computed tomography (CT); (2) Consistent with the diagnostic criteria related to stroke dysphagia in the National Cerebrovascular Conference[10]; (3) Cases with different degrees of swallowing abnormalities; (4) Age ≥ 65 years old.

Patients with abnormal liver and kidney function, cancer, mental abnormalities, and unstable vital signs were excluded.

Procedures

The establishment of a cluster nursing group: before the commencement of the study, a cluster nursing group was formed, and the head nurse of the department was selected as the group leader. The group members included senior nursing staff, speech therapists and specialist nursing staff who had been trained in professional skills. The group members held regular meetings, reported the progress, and built a WeChat group to facilitate communication. Routine nursing was provided for the elderly patients in the control group, and targeted functional training was carried out for the organs that control the swallowing function of the human body, such as muscle strength training, sputum excretion training and upper limb feeding ability training, and oral care was performed in the morning and evening. The patients in the observation group were treated with cluster nursing, including feeding nursing, emotional nursing, family support, functional exercise, environmental nursing, medication management and continuous nursing.

Elderly patients in the observation group were given cluster nursing. The patients' nutritional and dietary status, degree of dysphagia, mental health status, activities of daily living (ADL) and family environment were comprehensively evaluated, and then the nursing process was implemented. The specific care plan was as follows: (1) The nursing staff arranged a warm dining environment for this group so they could eat as comfortably as possible. The nursing staff regulated the total amount of food consumed by the patient each meal and guided him or her to chew fully. According to the situation of the case, the appropriate feeding angle was selected to avoid dysphagia or aspiration. At the same time, a scientific nutrition configuration plan was given to ensure appropriate nutritional intake. Patricia Hägglund found that mortality is significantly higher among older people with swallowing dysfunction combined with poor oral health[11]. Therefore, the nursing staff implemented oral health care procedures, carrying out strict, standardized operations in the morning and evening. When a patient is prone to choking, coughing, etc., the nursing staff should make a detailed emergency measure. A patient with a cough should be treated immediately. First, the patient should be helped to bow and bend down so that the jaw is close to the chest. The scapula is then beaten from bottom to top to facilitate the coughing-up of food residue. After coughing up, the patient should be helped to breathe smoothly. (2) Emotional care: Patients that have anxiety about the treatment are not ideal. Throughout the whole process of rehabilitation

nursing, it is necessary to pay attention to patients' psychological states and attempt to alleviate any negative emotions, ensuring that patients can maintain a relatively stable and comfortable state of mind. (3) Family support of the case: This involves an in-depth understanding of the family condition of the patient based on communication with the family. It is recommended to seek close relatives of the patient to provide them with emotional support and encouragement and suggest that the family members visit often. The nursing staff informed the family members of the patient in detail about the daily procedures of home rehabilitation after discharge. (4) Statistics and observation of daily exercise results: Based on the condition of each case, the nursing staff developed appropriate rehabilitation training programs for the improvement of swallowing function and techniques, such as empty swallowing, oral sensory stimulation, breath holding, active and passive movement of the tongue, etc., and improved the intensity of feeding training on the basis of the above, twice a day, about 20 minutes at a time. Shen Chen et al. found that the basic activities of daily living were a risk factor for dysphagia[12]. In a Patricia Hägglund study, oropharyngeal dysphagia was associated with ADL capability[13]. Hence, in addition to the routine rehabilitation training and swallowing function training, they are also trained in the functions required for their daily life, such as brushing teeth, washing, dressing, eating, toileting, standing, leaving bed, proper weight-bearing, etc. Statistics and observation of the effect of daily exercise can be made into a statistical table of improvement each week. On the one hand, it is helpful to provide reference data for doctors, so as to give intensive training programs to those showing inadequate improvement. On the other hand, it can allow elderly patients and their families to clearly see the progress and enhance their confidence in rehabilitation nursing. (5) Environmental care: This encompasses providing a quiet and warm environment for the patient in the process of eating and expectoration, and a comfortable environment is beneficial to facilitate the treatment and rest of the patient. (6) Medication management: Studies have shown that antipsychotics, benzodiazepines, anti-Parkinson drugs, antidepressants, and antiepileptic drugs are associated with dysphagia, while beta-blockers, alpha-blockers, opioids, antiemetic drugs, antivertiginous drugs, antihistamines, metoclopramide, domperidone, anticholinergic drugs, and loop diuretics can increase the risk of dysphagia in elderly patients[14]. Most elderly patients have multiple diseases and often take a variety of drugs, which increases the risk of drug-induced dysphagia and affects the recovery of the swallowing function. Therefore, the prescription of psychotropic drugs should be limited without affecting the treatment of diseases, and the medication regimen (including drug type, quantity and compatibility) should be optimized to avoid an excess of medications, and the medication regimen should be evaluated and adjusted periodically. (7) Continuous nursing: This includes establishing a WeChat group before leaving the hospital, and regularly performing functional training and dietary guidance for patients and their families according to the rehabilitation results of patients; relevant popular science lectures should be regularly promoted, so that patients and their families can actively participate in the self-management of the swallowing function rehabilitation.

Measures

The general data of the two groups were collected and compared.

The quality of life scale (QOL) [15]was used to evaluate the quality of life of the two groups. The scale includes three dimensions (psychological, physiological, and social adaptability), subdivided into 18 health fields, a total of 42 questions, and each question was divided into 5 levels. The health status was scored 1,2,3,4, and 5 points from the worst to the best, with a score range of 42-210 points. High scores represent high quality of life.

Neurological impairment was assessed using the National Institute of Health Stroke Scale (NIHSS)[16]. The higher the score, the more severe the neurological impairment in the elderly case.

The Water Swallowing Test (WST)[17] was used to evaluate the swallowing function of the patients: grade I is excellent, indicating that the elderly patient could swallow the water smoothly in a single attempt; grade II is good, signifying that the patient could swallow all the water in less than 2 attempts without choking cough; grade III is medium, suggesting that the patient could swallow all the water in a single attempt, but accompanied by the occurrence of cough; grade IV is acceptable, demonstrating that the patient could swallow all the water in less than 2 attempts, but accompanied by coughing; and grade V level is poor, indicating that the patient could not swallow the water completely, and there was frequent coughing.

Data analysis

SPSS26.0 software was used to analyze the data. The measurement data with uniform variance and normal distribution were expressed in the form of ($\overline{x} \pm s$), and the numerical data were expressed in the form of (%). The rank sum test was used to compare the rank data, and the t test was used to compare the remaining data. $P < 0.05$ was considered statistically significant.Results

Two groups of general information

As Table A shows, there was no significant difference in general data between the two groups ($P > 0.05$).

The improvement of living ability and neurological function

As illustrated in Tables B and C, after nursing, the quality of life assessment of the two groups were improved compared to before nursing, and the comparison before and after nursing in the observation group was statistically significant ($P < 0.05$). The quality of life evaluation score of the observation group after nursing was higher ($P < 0.05$). After nursing, the NIHSS scores of the two groups decreased, and the difference before and after nursing in the observation group was statistically significant ($P < 0.05$). The NIHSS score of the observation group after nursing was significantly lower ($P < 0.05$).

Improvement of dysphagia

Table D shows that the relief effect of dysphagia after nursing in the observation group was higher than that in the control group ($P < 0.05$).

Discussion

Stroke is a cerebrovascular disease with high rate of incidence. High risk groups include middle-aged and elderly people. One frequent complication is abnormality of the swallowing function, which affects the nutritional intake of patients and can easily lead to choking cough and

aspiration pneumonia from drinking water. Patients are prone to negative emotions, thus lowering their willingness to receive treatment and nursing compliance, complicating the rehabilitation process and prognosis of patients[18].

Routine nursing is most commonly administered. However, with its mediocre results on patients' quality of life, this method cannot always meet the clinical nursing needs of patients. An emerging new nursing methods of recent years, cluster nursing can not only comprehensively and systematically care for patients' physical symptoms, but also achieve the goal of systematic evaluation and improvement of nursing patients' psychological states. Medical workers have standardized previously diverse nursing practices so that patient care is more scientific[19]. Conventional rehabilitation nursing only aims to mitigate the impact of the disease on patients; it cannot improve the burden of psychological distress, thus limiting the effect of rehabilitation. Cluster nursing was initially used in intensive care units to prevent ventilator-associated pneumonia. It integrated the concept of evidence-based nursing into clinical nursing, so as to provide the best nursing practices for critically ill patients[20]. In recent years, cluster nursing has been used in many clinical settings. It can convert relevant policies and guidelines into feasible nursing programs, transform the uncoordinated nursing practices into a standardized system.

In this study, compared with the conventional nursing method, the cluster nursing method with comprehensive evaluation is conducive to significantly improving the physiological, psychological and social adaptation of patients, and the improvement of neurological impairment and dysphagia is significantly superior to the results of conventional nursing methods. Domestic research shows that the life ability score of patients in the observation group after cluster nursing is considerably higher than that of patients with routine nursing (routine group)[21]. By analyzing the improvement of living ability and neurological function in the two groups, it was found that after nursing, the quality of life evaluation scores of the two groups were improved compared with those before nursing, and the comparison before and after nursing in the intervention group was statistically significant ($P < 0.05$; the quality of life assessment after nursing in the intervention group was higher ($P < 0.05$). After nursing, the NIHSS scores of the two groups decreased, and the comparison before and after nursing in the intervention group was statistically significant ($P < 0.05$). The NIHSS score of the intervention group after nursing was significantly lower ($P < 0.05$), which was the same as the research results of Zhou Yan et al.[22] on stroke cases with cluster nursing; this indicates that the methodology of cluster nursing can comprehensively improve the physiological, psychological and social adaptation of patients. In addition, patients can be more active in leisure and entertainment, increasing the time spent on interpersonal communication, which is conducive to the improvement of social adaptability[23,24]. Yan Bingxiu et al. [25] mentioned in a study that the use of cluster nursing has great benefits on the motor function of patients with cerebral infarction, and the improvement of quality of life is also apparent. The study of Zhu Tingting et al.[26] also pointed out that cluster nursing can gradually restore the mental health status of stroke patients with dysphagia, thus promoting the improvement of the quality of life of the patients. The results of this study are consistent with those of previous reports.

Conclusion

In summary, the effect of cluster nursing on the improvement of symptoms in elderly patients with dysphagia after stroke is better than that of routine nursing, with superior improvement of neurological function, quality of life and swallowing ability.

Declaration of competing interests

No conflicts of interest have been declared by the authors.

References

1. Ruige L. Effect of cluster nursing on rehabilitation effect and quality of life of stroke patients with swallowing dysfunction. Biped and Health. 2018 Feb; (4): 20-24. Doi: 10.19589/j.cnki.issn1004-6569.2018.04.020.
2. Zhu L, Min S, Yang P, et al. Application of Cluster Nursing Among Post-Stroke Patients with Dysphagia. Clinical Nursing Research. 2018 July; (3): 21-25. Doi: 10.26689/JCNR.V2I3.388.
3. Wenwen L. Study on the application of cluster nursing in the rehabilitation of stroke patients with dysphagia. Chinese Primary Health Care. 2018 Dec; 32 (12): 79-81. Doi: 10.3969/j.issn.1001-568X.2018.12.0029.
4. Foley NC, Martin RE, Salter KL, Teasell RW. A review of the relationship between dysphagia and malnutrition following stroke. J Rehabil Med. 2009 Sep;41(9):707-13. Doi: 10.2340/16501977-0415. PMID: 19774302.
5. Corrigan ML, Escuro AA, Celestin J, Kirby DF. Nutrition for the stroke patient. Nutr Clin Pract. 2011 Jun; 26(3): 242-52. Doi: 10.1177/0884533611405795. PMID: 21586409.
6. Hutchinson E, Wilson N. Acute stroke, dysphagia and nutritional support. Br J Community Nurs. 2013 May; Suppl: S26-9. Doi: 10.12968/bjcn.2013.18.sup5.s26. PMID: 23752291.
7. Jing Z, Qing Y, Lingfeng X. Application of cluster nursing combined with respiratory training in patients with dysphagia after stroke. Chinese Contemporary Medicine. 2021; 28(22): 256-259. Doi: 10.3969/j.issn.1674-4721.2021.22.072.
8. Yuerong D. Nursing countermeasures and effect evaluation of aspiration prevention in elderly patients with dysphagia. Journal of Contemporary Clinical Medicine. 2021; 34(5): 105. Doi: 10.3949/j. issn. 2095-9559.2021.05.072.
9. Hongyun Y, Minyi T, Ping X. Preventive effect of cluster nursing on aspiration in patients with acute stroke. Journal of Clinical Nursing in Practice 2019; 5 (1): 139-142. Doi: 10.11997/nitcwm. 201901041.

10. Haiyan L, Wei F. Effects of standard swallowing function assessment and diet management on rehabilitation of elderly stroke patients with dysphagia. Nursing Practice and Research. 2018; 15 (5): 27-29. Doi: 10.3969/j. issn. 1672-9676.2018.05.011.

11. Hägglund P, Koistinen S, Olai L, Ståhlnacke K, Wester P, Levring Jäghagen E. Older people with swallowing dysfunction and poor oral health are at greater risk of early death. Community Dent Oral Epidemiol. 2019 Dec; 47(6): 494-501. Doi: 10.1111/cdoe.12491. Epub 2019 Aug 13. PMID: 31407829; PMCID: PMC6899490.

12. Chen S, Cui Y, Ding Y, Sun C, Xing Y, Zhou R, Liu G. Prevalence and risk factors of dysphagia among nursing home residents in eastern China: a cross-sectional study. BMC Geriatr. 2020 Sep 17; 20(1): 352. Doi: 10.1186/s12877-020-01752-z. PMID: 32943011; PMCID: PMC7495827.

13. Hägglund P, Gustafsson M, Lövheim H. Oropharyngeal dysphagia and associated factors among individuals living in nursing homes in northern Sweden in 2007 and 2013. BMC Geriatr. 2022 May 13; 22(1): 421. Doi: 10.1186/s12877-022-03114-3. PMID: 35562667; PMCID: PMC9107260.

14. Wolf U, Eckert S, Walter G, Wienke A, Bartel S, Plontke SK, Naumann C. Prevalence of oropharyngeal dysphagia in geriatric patients and real-life associations with diseases and drugs. Sci Rep. 2021 Nov 9; 11(1): 21955. Doi: 10.1038/s41598-021-99858-w. PMID: 34754078; PMCID: PMC8578645.

15. Yanling F, Yutao W, Xinhuai X, et al. Analysis of influencing factors of quality of life in elderly patients with type 2 diabetes mellitus complicated with coronary atherosclerosis. The Journal of Practical Medicine. 2020; 36(23): 3250–3255. Doi : 10.3969/j.issn.1006-5725.2020.23.017.

16. V. Chalos, N.A.M. van der Ende, H.F. Lingsma, M.J.H.L. Mulder, E. Venema, S.A. Dijkland, et al., National Institutes of health stroke scale, Stroke 51 (1) (2020) 282–290. Doi.org/10.1161/strokeaha.119.026791.

17. Ye T, Huang S, Dong Y, Dong Q. Comparison of two bedside evaluation methods of dysphagia in patients with acute stroke. Stroke Vasc Neurol. 2018 Nov 14; 3(4): 237-244. Doi: 10.1136/svn-2018-000170. PMID: 30637130; PMCID: PMC6312077.

18. Yun W, Yu Q, Xiangrong Y, et al. Study on the effect of early rehabilitation nursing in stroke patients with dysphagia. Medical Journal of National Defending Forces in Northwest China. 2018; 39(18): 545-549. Doi: 10.16021/j.cnki. 1007-8622.2018.08.013.

19. Xiaomei H. Preventive effect of cluster nursing intervention on deep venous thrombosis of lower extremities in patients with ischemic stroke. Practical Journal of Cardiac Cerebral Pneumal and Vascular Disease. 2018; 26 (1): 155-157. Doi: 10.3969/j.issn.1008-5971.2018.01.044.

20. Yanqun H, Wei Z. Effects of cluster nursing on quality of life, anxiety and depression in stroke patients with dysphagia. Anhui Medical and Pharmaceutical Journal. 2019; 23 (10): 2061-2065. Doi: 10.3969/j.issn.1009-6469.2019.10.040.

21. Qing C, Renjuan W, Quanfeng F, et al. The effect of cluster nursing model in patients with

dysphagia after stroke. Medical Innovation of China. 2021; 18 (28): 106-109. Doi: 10.3969/j.issn.1674-4985.2021.28.026.

22. Yan Z. Effect of cluster nursing on rehabilitation and quality of life in patients with dysphagia after cerebral infarction. Chronic Pathematology Journal. 2019; 20 (3): 404-406. Doi: 10.16440/j.cnki.1674-8166.2019.03.031.

23. Yan Z, Wenwei L, Yaying Z, et al. The effect of cluster nursing intervention on anxiety and depression in stroke patients with dysphagia. Guangxi Medical Journal. 2018; 40(24): 2972-2977. Doi: 10.11675/j. issn. 0253-4304.2018.24.30.

24. Min D. Effect of cluster nursing on rehabilitation effect and quality of life in stroke patients with dysphagia. International Journal of Nursing. 2018; 37 (8): 1088-1091. Doi: 10.3760/cma.j.issn.1673-4351.2018.08.025.

25. Bingxiu Y, Liangliang J, Shuguang C. Analysis of the effect of cluster nursing on the quality of life of stroke patients with dysphagia. Systems Medicine. 2020; 5(9): 162-174. Doi: 10.19368/j.cnki.2096-1782.2020.09.162.

26. Tingting Z, Xiaoling T, Ruirui L, et al. The effect of cluster nursing on stroke patients with dysphagia. Journal of Qilu Nursing. 2021; 27 (1): 142-144. Doi: 10.3969 /j. issn. 1006－7256.2021.01.051.