

DYSPHAGIA SCREENING PROTOCOL FOR ACUTE STROKE PATIENT: A LITERATURE REVIEW

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ABSTRACT

Background: Nearly two-thirds of acute stroke patients have dysphagia. Dysphagia is difficulty to swallow food or liquids. Early detection of dysphagia is crucial in stroke patients as a result of increased morbidity and mortality due to malnutrition and respiratory tract infections.

Aim: Our purpose was to conduct a literature review of dysphagia screening for stroke patient.

Methods: We used the boolean operator to search articles of “or” and “and” with the key words were "Dysphagia" or “Screening”, AND "Stroke" or Acute Stroke” AND "Nursing". Data based used were Scopus, Proquest and Science Direct with inclusion criteria using full text in English which published from 2019 to 2021. We obtained 240 articles and then we screened by reading the main focus of articles with paying attention to the topics and the suitability of article content.

Result: Twenty five publications relating to dysphagia screening met the inclusion criteria. There are five methods of dysphagia screening performed by nurses or other health workers: 1) a simple Questionnaire Test (4QT) method; 2) Water Swallow Test (WST) method; 3) Bed Side Screening Tool for Dysphagia (BSTD) method; 4) Volume Viscosity Swallow Test (V-VST) method; 5) EAT-10 method.

Conclusion: screening is the first step in the identification of swallowing impairment or dysphagia of stroke patient. Dysphagia is an independent predictor of poor patient outcome and prolonged recovery time. Nurse has an important role to conduct a screening and must ensure that the selected tools has high reliability and concurrent validity.

Key Words: Dysphagia, Nursing, Screening, Stroke

INTRODUCTION

Stroke is a leading cause of disability and death worldwide (1). The priority of nursing intervention are to maintain nutrition and ensure that stroke patient could swallow safely without aspiration (1,6). Stroke may lead to mild, moderate or severe swallowing difficulties. Several recent studies highlight the impact of dysphagia on dehydration, malnutrition, and aspiration pneumonia (6). Aspiration pneumonia was associated with prolonged hospital stay; worsening stroke patient outcome, and increased mortality (6).

Dysphagia defined as difficulty in food or liquid passing from the mouth, through the pharynx to the esophagus and onwards to the stomach (6). Approximately 65-90% of dysphagia patients experience disturbances in the oropharyngeal phase, changes in lung function, risk of aspiration, nutrition, and quality of life (5). However, in some patients dysphagia will improve spontaneously within one week after the attack, about 50% will persist for up to six months, and a small proportion will be permanent (7). A study conducted by Paiva et al showed that stroke patients with dysphagia and had nasogastric tube increased the risk of disability, almost 15 times than patient non dysphagia (p 0,002 OR=14,97).

Dysphagia screening can detect swallowing problems early in acute stroke patients and prevent aspiration or other complications such as dehydration or nutritional problems (8). According to the AHA recommendations, screening for dysphagia should be performed before giving the stroke patient any food, water, or an oral medicine (9). Stroke patient with dysphagia to have more likely to develop pulmonary infection (13,1% versus 1,9%), to have more difficulty in activity daily livings (52,4% versus 18,0%), and to have prolonged length of stay at hospital (14,0% versus 4,3%). The AHA also recommends that dysphagia screening be carried out by speech therapists or other trained health professionals (9). Patients can have a stroke at any time of the morning, afternoon, or evening. Because nurses are on duty 24 hours in the Emergency Room or the Stroke Unit, it is the nursing profession that is most likely to screen for dysphagia (1). A qualitative study on dysphagia screening by Couto and Oliveira showed that nurses had different perceptions and used different protocols and instruments to conduct dysphagia screening (1)

Dysphagia is associated with worse functional outcomes, which entails the poorer quality of life, and increased length of stay (1). Various screening methods for dysphagia have been developed and have satisfactory sensitivity and specificity. There is a need for protocol and

dysphagia screening policies for stroke patients in the emergency room or the Stroke Unit by hospital management so that dysphagia screening can be carried out on time and procedures. Dysphagia screening in acute stroke must be administered by nurses as early as possible so that patients are not kept nil by mouth for unnecessary time.

METHOD

The design of this research is a literature review. The article should describe the variables corresponding to the problem discussed. Search for articles using the operator of "or" and "and". The data collection was carried out in April 2021 with the keywords "Dysphagia" and "Stroke" and "Nursing". Data based used were Scopus, Science Direct, and Proquest with inclusion criteria using full text, the document type is an article and English language in the period of 2019 to 2021. We obtained 240 articles which were 133 from Scopus, 10 from Science Direct, and 97 from Proquest. The articles were then screened by reading the main article part with focusing on the topic and the suitability of the article content from the abstract, methods, and the result. In the end, seven articles matched the predetermined criteria and were used in this literature review.

RESULT

Table 1 Distribution of current dysphagia screening methods and the result

Researcher, Year	Title	Result
Oliveira et al, 2020	Nurses' preferred items for dysphagia screening in acute stroke patients: A qualitative study	20 nurses have different perceptions based on patient clinical data and the screening instruments (1)
Eltringham et al, 2019	Variation in dysphagia assessment and management in acute stroke: An interview study	Fifteen nurses from five hospitals thought that there was no standardized dysphagia screening protocol in the hospital (10)
Tsang et al, 2020	A New Simple Screening Tool—4QT: Can It Identify Those with Swallowing Problems? A Pilot Study	100% sensitivity, 80.4% specificity. The 4QT instrument is very sensitive for screening for dysphagia but is not specific for stroke patients. A positive prediction of 50%, only 50% of patients screened for dysphagia after reconfirmation by speech therapists that it is true dysphagia (7).

<u>Melgaard et al, 2020</u>	Systematic dysphagia screening of elderly persons in the emergency department—a feasibility study	A nurse applying the Simple Water Swallow test was subsequently reconfirmed by the occupational therapist. The result is that screening for dysphagia in the elderly can be carried out by nurses in the Emergency Room (3)
Immovilli, 2021	Diagnostic Accuracy of a Bedside Screening Tool for Dysphagia (BSTD) in Acute Stroke Patients	Nurses screened using BSTD in 33.3% of cases and speech therapists in 30% of cases. The result is Cohen K 0.92 (optimal suitability when $K > 0.8$), sensitivity 100%, specificity 95.2% (8)
Dong, Huang, & Dong, 2021	The Modified Volume-Viscosity Swallow Test as a Predictor of Aspiration Pneumonia after Acute Ischemic Stroke	The dysphagia screening method using the modified V-VST is an easy-to-use and reliable screening tool for the detection of dysphagia in stroke patients (2)
Masahiro et al, 2020	Simplified cough test can predict the risk for pneumonia in patients with acute stroke	The Simplicity Cough Test method is a strong indicator for predicting pneumonia in acute stroke patients (11)
Ana et al, 2019	Lesion location and other predictive factors of dysphagia and its complication in acute stroke	The V-VST is a validated method to screen the patient ability of swallowing. Nurses have to consider the signs of impaired efficacy of swallow like as changes in voice quality (including wet voice), cough or a decrease in oxygen saturation

DISCUSSION

DYSPHAGIA

Stroke is the first leading cause of death in Indonesia. Most of the causes of death of stroke patients are lung infections as a complication of dysphagia (13), with a mortality rate of 12.8% higher than stroke patients without dysphagia (3). In general, there is about 8% of the population in the world has dysphagia, and the incidence of dysphagia in stroke patients is very high, reaching almost 80% (1,3,4,8). Dysphagia is a disorder in swallowing food and or fluids, as a result of muscle weakness in swallowing in stroke patient or as a result of the aging process. Nearly half of the elderly in Spain (47.4%) who are over 70 years old experienced dysphagia (4). Dysphagia can lead to complications, such as aspiration pneumonia (2). A study in Taiwan found that dysphagia is a critical factor in aspiration pneumonia and malnutrition (14).; dehydration; and malnutrition, which in turn can lead to prolonged hospital stay (5); psychological disorders such as stress, anxiety, and depression; decreased quality of life (15); increased health costs; increased mortality

and decreased patient outcomes after stroke (16). Based on a study by Takeda et al, aspiration was observed in 16 of 172 patient when swallowing 3 ml of water during Video Fluoroscopy was conducted (17). Another important result from study by Meschi et al is the association between dysphagia and low physical performance (18). Many stroke patients recovery swallowing spontaneously, but 11%-50% still have dysphagia at 6 months (19). Post stroke dysphagia may cause aspiration of oral secretion, ingested food or liquids and to be the primary risk factor to pneumonia (19). Management of dysphagia patients is carried out by a multidisciplinary team approach, consisting of doctors, nurses, speech language pathologist, occupational therapists, and nutritionists (13). The nurse uses a nursing process that begins with an assessment, specifically the assessment of swallowing function by screening for dysphagia (4). The results of a study on nurses' perceptions regarding the assessment of swallowing function in stroke patients are very important, but the results of these assessments are not well documented, especially if they do not use protocol or instruments screening (14)

DYSPHAGIA SCREENING

The purpose of screening for dysphagia is to screen whether or not it is safe for patients to eat, drink and take oral medications (4). Screening is a means of judiciously selecting individuals who need a comprehensive examination. One key feature to the interpretation of screening approaches is that they are pass or fail procedures (20). According to the recommendations of the AHA, all stroke patients should be treated with dysphagia screening before eating, drinking, or receiving oral medication (9). Screening for dysphagia should be carried out as early as possible in the Emergency Room, so that safe feeding and drinking techniques can be established for patients to prevent aspiration, which is less than one hour after the patient is admitted to the Emergency Room (5). Based on the result of study by Fairfield and Smithard, the majority of dysphagia screening (93%) was performed for less than 24 hours, and only 34% of them took less than 4 hours (4). The AHA recommends that screen for dysphagia in stroke patients to be performed by a speech language pathologist or other trained health care provider (9). Slightly different while the examinations of dysphagia using a special tools such as Video-fluoroscopy (VFS) or Fiberoptic Endoscopy Evaluation of Swallowing (FEES) must be done by a doctor, and the Carotis Auscultation should be done by a speech language pathologist (4). However, there is no consensus in four countries, namely the US, UK, Canada, and Australia, regarding who is most

recommended for dysphagia screening in the Emergency Room. Nurses are essential in the emergency team and should ideally be able screen and priorities dysphagia management in stroke patient (21). The nursing profession that is more likely to screen for dysphagia, because nurses are on duty 24 hours in the Emergency Room or Stroke Unit (1). A cross sectional study by Knight et al showed the majority nurses (n=100; 76,9%) had care for stroke patients with swallowing difficulty, with only 26,9% having received training about stroke care (22). Otherwise, based on study by Oliveira, Couto, and da Mota, the results of screening for dysphagia by nurses are as valid as those carried out by other professions (1). Likewise, the study results of Immovilli et al showed an Excellent Agreement > 0.8 between screening performed by nurses and Speech Pathologist or Occupational Therapist (22)(1). Another study shows that Allied Health Assistance (AHAs) also demonstrated the ability to conduct dysphagia screening on a cohort study (23). On the other hand, a study from knight et al found that nurses across all levels had only moderate knowledge regarding identification and management of acute stroke (22).

METHODES AND INSTRUMENT OF SCREENING

There is no consensus on the method of screening for dysphagia between hospitals, so the use of protocols or instruments still varies (24). The oldest and most frequently used method is the Water Swallowing Test (WST) (6). The test by giving water varies depending on the perception of the nurse, ranging from 3 ml to 60 ml. Although the sensitivity and reliability of WST are satisfactory, there is a risk that the patient aspirates and experiences oxygen desaturase, so pulse oximetry and oxygen must be prepared. The second instrument is a questionnaire containing 4 questions to the patient or family or 4QT (7). Questions include: is there a cough or choking after eating; does it take longer than usual to eat more; is there a change in consistency with meals; and whether there is a change in voice after eating or drinking. Although this method is very sensitive, it is less specific to use for fusing dysphagia in stroke patients (4). The next method is the Oropharyngeal Dysphagia Screening Test for Patients and Professionals (ODS-PP). This method is also a questionnaire for patients consisting of 18 question items, among others: is there a cough or choking during and after meal or drinking; is there difficulty of breath; whether there is a change in voice after eating or drinking. In general, the ODS-PP method has high reliability and concurrent validity (25). The next method is The Volume-Viscosity Swallow Test (V-VST) is a bedside method to screen patients for dysphagia (12). The V-VST was designed as an effort test to identify

clinical signs of impaired efficacy (efficacy of labial seal, presence of oral or pharyngeal residue and presence of piecemeal deglutition) and safety (voice changes, cough and decrease in oxygen saturation $\geq 3\%$) of swallow. To protect the safety of patients, the test starts with nectar viscosity and increasing bolus volumes (from 5 to 10 and 20 ml) in a progression of increasing difficulty. If patients complete the nectar series without cough or aspiration, a less safe liquid viscosity series is assessed and then a safer pudding viscosity series is performed in the same way. The study showed that the accuracy of the V-VST inpatients was safe, quick and accurate, with sensitivity and specificity of 88.2% and 64.7%, respectively (12). The last method that we reviewed was the instrument EAT-10. The Ten 10-item Eating Assessment Tool (EAT-10) is a symptom-specific tool, commonly used in clinical practice. The questionnaire contain of 10 item, with a maximum total score of 40 points. Score is 3 or greater than 3 points suggests a potential swallowing problem (18). The ten questions including: 1) The swallowing problem make patient lose; 2) The swallowing problem interferes patient ability to go out for meals; 3) Patient takes extra effort to swallow liquids; 4) Patient takes extra effort to swallow solids; 5) Patient takes extra effort to swallow pills ; 6) Patient feel painful when swallow; 7 The patient pleasure of eating is affected by swallowing; 8) When patient swallow food sticks in their throat; 9) Patient cough when they eat; 10) Swallowing is stressful for patient (18).

CONCLUSION

Dysphagia in stroke patients must be managed properly, starting from early detection through dysphagia screening as part of nursing assessment. The objectives of screening are to prevent aspiration and establish efficient and safe oral intake for stroke patients. Screening should carried out as early as possible less than one hour after the patient arrives at the Emergency Room. The methods and instruments are used must be simple, require a short time, have a low risk, and the screening tool would have both high sensitivity and high specificity.

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