Nursing Dysphagia Screening To Prevent the Occurrence of Pneumonia among Stroke Patients In Indonesia: A Literature Review

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ABSTRACT

Dysphagia is a frequent complication in stroke. Patients with dysphagia have a potential risk of pneumonia, malnutrition, dehydration, increased the length of stay and even death. One of nursing intervention that is considered important in the management of stroke patients is dysphagia screening because it can reduce aspiration and pneumonia and other complications that can occur in dysphagia. The study aimed at describing the nursing dysphagia screening to prevent the occurrence of pneumonia in stroke patients in Indonesia. This paper used a literature review. The literature search was conducted of articles published from January 2008 through October 2018 using the PubMed, Embase, Cochrane Library and EBSCOhost databases on compared three of dysphagia screening. This search resulted in a total of 6 articles. Evidence has indicated that The National Institutes Of Health Stroke Scale Screening is considered to be the most effective type of dysphagia screening in preventing pneumonia in stroke patients who experience dysphagia. The NIHSS has a sensitivity value, specificity, positive predictive value, and negative predictive value that is quite good and considered safe to be applied in screening for dysphagia in stroke patients in Indonesia.

Keywords: dysphagia screening, dysphagia in stroke, The National Institutes of Health Stroke Scale, Nursing Admission Screening Tools, Functional Independence Measure

1. Introduction

Dysphagia is a condition where a person has difficulty swallowing both foods that are liquid or solid (1). Dysphagia is a frequent complication in stroke patients, which occurs in 50% of patients with stroke cases (2, 3). The damage that occurs after the occurrence of cerebral infarction due to stroke will cause the swallowing process to slow down, muscle coordination becomes worse, and muscle strength weakens (4). Although in some stroke patients the condition of dysphagia will improve spontaneously, in 11-50% of cases of stroke patients still experience dysphagia after six months after hospitalization (3).

Patients with persistent dysphagia will experience a risk of pneumonia, malnutrition, dehydration, increased length of stay and even death (3). Patients with

dysphagia have an 8.5-fold higher risk of death compared to those with normal swallowing (5). Dysphagia often follows strokes that affect the dominant ingestion of the cortex, which is then compounded in recurrent strokes. This is because stroke patients have difficulty controlling the tongue and cannot chew and swallow food particles because the swallowing phase in the oral and pharynx is disrupted (6).

Dysphagia is associated with a more extended rehabilitation period because patients with dysphagia show relatively poor functional recovery compared to those without dysphagia (7). Therefore, proper care and strategy in the management of dysphagia in stroke patients are critical. Nurses, who are 24 hours a day in the hospital with patients, are in an excellent position to identify individuals with difficulty swallowing and initiating interventions that can prevent further complications in stroke patients who have dysphagia. One nursing intervention that is considered important in the management of stroke patients is dysphagia screening (6). Screening for dysphagia in stroke patients is recommended because it can reduce aspiration and pneumonia and other complications that can occur in dysphagia (8).

There are many types of dysphagia screening that nurses can do such as the National Institutes of Health Stroke Scale (NIHSS), Burke Dysphagia Screening Test, Swallow Screen (GuSS), Massey Bedsite Swallow Screen, Toronto Bedside Swallow Screening, Nursing Admission Screening Tools, Functional Independence Measure (FIM) and others. This paper will discuss the effectiveness of the National Institutes of Health Stroke Scale (NIHSS), the Nursing Admission Screening Tools, and Functional Independence Measure (FIM) in screening dysphagia in stroke patients so that the incidence of pneumonia can be prevented. The aim of this literature review was to a comparison between The National Institutes Of Health Stroke Scale, Nursing Admission Screening Tools, and Functional Independence Measure to preventing the occurrence of pneumonia in stroke patients in Indonesia.

2. Method

2.1 Data sources

The research method used in this paper is the literature review. To collect data, the author uses several databases namely Pubmed, Cochrane Library, EbscoHost, and Google Scholar.

2.2 Search strategy

The author also uses several search keywords namely "dysphagia screening," "dysphagia in stroke," "National Institutes of Health Stroke Scale," "Nursing Admission Screening Tools," and "Functional Independence Measure. Also, searches are limited to articles containing full text from January 2008 to September 2018. These terminologies are used in combination so that the literature found is more specific.

2.3 Inclusion criteria

The article search inclusion criterion is (1) a discussion article about nursing dysphagia screening to preventing the occurrence of pneumonia in stroke patients; and (2) English-language articles.

3. Results

The search results produced six articles consisting of 2 cohort study articles, two articles retrospective cohort study, one evidence implementation project, and one pre- and post-intervention trial served article (table 1).

3.1 Definition of dysphagia

Dysphagia is a condition where a person has difficulty swallowing both foods that are liquid or solid (1). Dysphagia is a common morbidity following acute stroke. The trouble with swallowing (dysphagia) is one of the most common physical consequences of having a stroke (9). The damage that occurs after the occurrence of cerebral infarction due to stroke will cause the swallowing process to slow down, muscle coordination becomes worse, and muscle strength weakens (4).

3.2 Dysphagia screening Method

3.2.1 National Institutes of Health Stroke Scale

National Institutes of Health Stroke Scale (NIHSS) is a tool used by healthcare providers to quantify the impairment caused by a stroke objectively. The NIHSS is composed of 11 items: the levels of consciousness, language, neglect, visual-field loss, extraocular movement, motor strength, ataxia, dysarthria, and sensory deprivation, each of which scores a specific ability between a 0 and 4 (10). NIHSS is the most widely used deficit rating scale in modern neurology and became the gold standard for stroke severity rating after the first successful trial in acute stroke therapy (10). The score NIHSS >9 is moderately predictive of clinically relevant dysphagia (11).

3.2.2 Nursing Admission Screening Tools

Nursing Admission Screening Tools is a tool that consisted of 11 items: decreased consciousness, decreased orientation, inability to follow commands, severe facial weakness, failure to control saliva, weak cough, abnormal speaking voice, poorly articulated speech, patient or family report of difficulty swallowing, cough after swallow, and voice change after swallow. If anyone of these 11 items was present, the screening was considered "positive," and nurses were instructed to make the patient nil per os (NPO) or "nothing by mouth." (1).

3.2.3 Functional Independence Measure

The Functional Independence Measure (FIM) is an 18-item of physical, psychological and social function. The tool is used to assess a patient's level of disability as well as a change in patient status in response to rehabilitation or medical intervention. The FIM is used by health care practitioners to assess and grade the functional status of a person based on the level of assistance he or she requires. Grading categories range from total independence to total support. Tasks that are evaluated using the FIM include bowel and bladder control, transfers, locomotion, communication, social cognition as well as the following six self-care activities (12). The results of the study suggest that improvement in FIM scores may play an essential role in the treatment of dysphagia (13).

3.3 Effect of Dysphagia screening to prevent the pneumonia

In one study, it was explained that early dysphagia screening was considered to avoid pneumonia, which is a cause of death in stroke patients (14). This study was conducted using a cohort research method to identify the relationship between

dysphagia screening which was late in the occurrence of pneumonia in stroke patients. The results showed that of 63,650 patients treated with acute stroke, 55,838 (88%) had dysphagia screening, and 24,542 (39%) had complete dysphagia. Patients with long delays in dysphagia screening have a higher risk of pneumonia. The conclusion of the study was the delay in screening for and assessing dysphagia after a stroke, associated with a higher risk of developing pneumonia. In connection with pneumonia is one of the leading causes of death after acute stroke, early assessment of dysphagia can contribute to preventing death from acute stroke and can be implemented by nurses. This is what makes the background of the importance of the application of dysphagia screening in stroke patients.

Comparison between NIHSS dysphagia screening, Nursing Admission Screening Tools, and FIM is explained from several research results. A study was conducted using the cohort retrospective method to assess sensitivity & screening specifications for dysphagia by using dysphagia and NIHSS screening tool to prevent pneumonia (1). From the results of the study it was found that the Nurse Admission Screening Tools had a sensitivity of 29% and specificity of 84% with predictions of a positive value of 50%, and predictions of a negative value of 68%. While the NIHSS results have a sensitivity of 79% and specificity of 68% with forecasts of a definite amount of 60% and forecasts of a negative value of 84%, based on data obtained from the study, it can be concluded that screening dysphagia uses NIHSS as an early screening tool in stroke patients that is effective in preventing pneumonia.

Other studies have also been conducted to compare dysphagia screening which aims to evaluate the use of NIHSS as prevention of pneumonia and a clinical predictor of post-stroke dysphagia conditions compared to FIM (15). This study was conducted using a retrospective study method by identifying medical records of all consecutive stroke patients received between July 2004 and July 2010 in acute stroke rehabilitation and hospitalization units. From the study, it was found that of 290 patients treated with acute stroke rehabilitation, 88 (30%) showed clinically relevant dysphagia during their rehabilitation period. The sensitivity analysis suggested that the cut-off values for NIHSS and FIM were> 9 and <55, respectively. Sensitivity, specificity, positive predictive value, and negative predictive value for NIHSS were 75%, 62%, 46%, and 85% respectively. While the sensitivity value, specificity, positive predictive value, and negative predictive value for FIM were 80%, 72%, 55%, and 92% respectively, from the results of these studies, it can be concluded that NIHSS is quite predictive in predicting clinically relevant dysphagia. Also, NIHSS is also considered useful in preventing pneumonia.

Table 1. Description of studies included in the literature review

Reference	Study design	The aim of the study	Method/ instrument used	Result
[1]	Retrospective cohort study	This study compared the diagnostic performance of two methods of screening for dysphagia among veterans hospitalized with an acute ischemic stroke.	Nursing admission screening tools and National Institutes of Health Stroke Scale	The NIHSS had better test characteristics in predicting dysphagia than the nursing dysphagia screening tool.
[6]	Evidence implementation project	To improve nursing management of dysphagia in acute stroke patients and prevent the occurrence of aspiration in patients admitted to the neurology	Review of nursing records; patients and caregiver interview/ survey	The current evidence implementation project has demonstrated significant improvements

		ward		in nursing practice related to dysphagia screening and management.
[8]	Pre- and post-intervention trial served	To compare the rate of pneumonia (primary outcome), time to dysphagia screening, and length of hospital stay (secondary outcomes) between a period when the first dysphagia assessment was done only by SLT and a period of 24/7 dysphagia screening including the application of the GUSS by nurses.	Swallow Screen (GuSS)	24/7 dysphagia screening can be effectively performed by nurses and leads to reduced pneumonia rates
[11]	Cohort study	To evaluate the utility of the NIHSS as a predictor of clinically relevant poststroke dysphagia compared with FIM	National Institutes of Health Stroke Scale	Although the NIHSS clinical test characteristics are not as favorable as the FIM, NIHSS appears to be more sensitive than some other reported methods such as a 3-sip water test.
[14]	Cohort study	Identifying the relationship between dysphagia screening which was late in the occurrence of pneumonia in stroke patients.	Sentinel Stroke National Audit Programme (SSNAP)	The delay in screening for and assessing dysphagia after a stroke, associated with a higher risk of developing pneumonia
[15]	Retrospective study	To evaluate the use of NIHSS as prevention of pneumonia and a clinical predictor of post-stroke dysphagia conditions compared to FIM	National Institutes of Health Stroke Scale and Functional Independence Measure	NIHSS is quite predictive in predicting clinically relevant dysphagia. Also, NIHSS is also considered useful in preventing pneumonia.

4. Discussion

Dysphagia screening is done with the aim of one of them to prevent the occurrence of pneumonia in stroke patients. Many types of testing can be done by stroke patients with dysphagia, including National Institutes of Health Stroke Scale (NIHSS), Burke Dysphagia Screening Test, Swallow Screen (GuSS), Massey Bedsite Swallow Screen, Toronto Bedside Swallow Screening, Nursing Admission Screening Tools, Functional Independence Measure (FIM). Each of these screening techniques has its own in screening for dysphagia in stroke patients. NIHSS, the Nursing Admission Screening Tools, and FIM are three of the many types of dysphagia screening that aim to prevent pneumonia in stroke patients. The reason for implementing dysphagia screening in stroke patients is to avoid complications, one of which is the incidence of pneumonia.

In Indonesia, it is estimated that every year 500,000 people will suffer a stroke and around 25% or 125,000 people will die while the rest will experience minor disabilities or even severe disabilities (16). Complications that occur as a result of dysphagia in stroke can lead to increased hospital stays, increased morbidity, and even (17). Based on the data obtained from the hospital of Ciptomangunkusumo Jakarta in January to December 2016 (18), there were 295 hemorrhagic and non-hemorrhagic stroke patients consisting of 150 men and 145 women. The number increased from January to December 2017, which is obtained by 306 hemorrhagic and nonhemorrhagic

stroke patients consisting of 164 men and 92 women with about 80% of patients having dysphagia.

Screening for dysphagia in stroke patients can be applied in Indonesia to prevent the occurrence of pneumonia, given the high number of strokes in Indonesia. From the discussion of some of the articles above, NIHSS is considered to be the most effective type of dysphagia screening in preventing pneumonia in stroke patients who experience dysphagia. This is because NIHSS dysphagia screening has a sensitivity value, specificity, positive predictive value, and negative predictive value that is quite good and considered safe to be applied in screening for dysphagia in stroke patients in Indonesia.

5. Conclusion

Dysphagia is a complication that often occurs in stroke patients and can cause pneumonia. Screening for dysphagia in stroke patients is recommended because it can reduce aspiration and pneumonia and other complications that can arise in dysphagia. From the article discussed earlier, the delay in screening for and assessing dysphagia after the stroke is associated with a higher risk of developing pneumonia. In connection with pneumonia is one of the leading causes of death after acute stroke, early assessment of dysphagia can contribute to preventing death from acute stroke and can be implemented by nurses.

There are several types of screening that can be done by nurses in assessing stroke patients who have dysphagia. Some of them are the National Institutes of Health Stroke Scale (NIHSS), the Nursing Admission Screening Tools, and Functional Independence Measure (FIM). From the results of several studies conducted to compare the three types of dysphagia screening, it was concluded that dysphagia screening using NIHSS was assessed as an early screening tool in stroke patients that was effective in preventing pneumonia compared to the other two types of dysphagia screening.

6. Study limitations

The limitations of this paper are the type of method used is the literature review so that the writing method used is not systematic and does not go through the biased assessment process.

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