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Fiberoptic Endoscopic Examination of Swallowing (Fees) Evaluation in Post-Stroke Patients

Puspa Zuleika[1*], Abla Ghanie[1], Adelien[1], Indriati Purwasari[1]

[1]Department of Otolaryngology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

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[*]**Corresponding author:**
E-mail address:
puspa_zuleika@gmail.com (Puspa Zuleika)
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ABSTRACT

Introduction. Complications caused by post-stroke dysphagia increase the morbidity and mortality of patients. Although it has a significant effect on the functional abilities and worsening of the patient's prognosis, post-stroke dysphagia is still under-noticed and often undiagnosed. The importance of knowing the incidence of post-stroke dysphagia, not only to determine its relationship to the pathology of the disease but also to assess treatment plans or follow-up interventions. This study aims to detect the incidence of FEES findings in post-stroke dysphagia both hemorrhagic and non-hemorrhagic stroke. **Methods.** Forty post-stroke patients in the Inpatient and Outpatient Unit of the Department of Otolaryngology and Department of Neurology in general hospital Mohammad Hoesin Palembang conducted a FEES examination to see leakage, residue, penetration, and aspiration after being given six different types of food boluses ranging from filter porridge, rice porridge, oatmeal, water, milk, and biscuits. The results of the assessment are recorded and analyzed descriptively. **Results.** From 40 research subjects found 25 people experiencing dysphagia, where patients with non-hemorrhagic stroke types were 21 people (52.5%), while hemorrhagic stroke types were four people (10%). The occurrence of leakage of filter porridge was five findings, leakage of rice porridge was eight findings, oatmeal leakage, water, and milk were seven findings each, and biscuit leakage was two findings. **Conclusion.** The incidence of dysphagia in post-stroke patients both hemorrhagic and non-hemorrhagic in Mohammad Hoesin Hospital Palembang is quite high at 62.5%.

1. Introduction

Dysphagia is a symptom that refers to difficulty whiles comfort while moving the bolus from the mouth to the stomach. Dysphagia is often associated with multiple systemic disorders, such as diabetes mellitus, hyperthyroidism, lupus erythematosus, and stroke disease. Stroke is a syndrome caused by the brain's circulatory disorders with acute onset, accompanied by clinical manifestations of neurological deficits and not as a result of tumours, trauma, or infection of the central nervous system. The clinical syndrome lasts 24 hours or more or directly causes death. Post-stroke dysphagia is dysphagia that occurs in people with stroke caused by disorders of the central nervous system and peripheral nervous system. Dysphagia occurs in 50% of patients after stroke. Post-stroke stroke is commonly found in hemorrhagic strokes compared to non-hemorrhagic strokes. Patients will experience improvement about seven days after the attack. There are about 11-50% of patients who experience persistent dysphagia up to 6 months afterwards. A study of dysphagia in acute stroke

found 118 out of 570 (20.7%) patients and remained in 60 patients after discharge. 1-3

The incidence of post-stroke dysphagia is associated with several complications that can accompany. Post-stroke dysphagia's presence increases the rate of dehydration, malnutrition, pulmonary complications, and mortality, which will cause a poor prognosis in patients. A study reported that 49% of post-stroke patients who underwent rehabilitation experienced malnutrition, which is related to dysphagia experienced. Other studies suggest that 58% of patients after acute stroke with dysphagia have more dehydration signs than those who do not. The most dangerous pulmonary complication is the incidence of aspiration pneumonia, where stroke patients who experience dysphagia are at risk three times more likely to develop aspiration pneumonia. Aspiration of pneumonia occurs in 43-50% of patients with post-stroke dysphagia in the first year, with an increase in 45% mortality. FEES can be an option for the evaluation of patients with dysphagia. This procedure can assess the anatomy and physiology of swallowing, airway protection and its relationship to the function of ingesting solid and liquid food, and subsequent diagnosis and therapy.4-5

Despite having a significant effect on functional ability, and worsening prognosis of stroke patients, post-stroke dysphagia is still under-addressed and often undiagnosed as a substantial cause of nutritional and respiratory distress in stroke patients. This situation causes complications caused by dysphagia increase morbidity and mortality of patients. Knowing the incidence of post-stroke dysphagia was essential to determine its relationship to the pathology of the disease and determine treatment plans or follow-up interventions.

2. Methods

This research was conducted at the Inpatient and Outpatient Installation of the Department of Otolaryngology and the Department of Neurology of General hospital dr. Moh Hoesin (RSMH) Palembang, held in January 2018 until the sample size was fulfilled. The population taken in this study were all patients who had been diagnosed with a stroke. The samples taken in the study were stroke patients who met the inclusion and exclusion criteria. Inclusion Criteria: (1) Patients diagnosed with a stroke, post-stroke seven days to 6 months, and cooperative patients if action is taken. These patients were treated at the Inpatient and Outpatient Installation of the THTKL Section and the Neurology Section of the general hospital Dr Mohammad Hoesin Palembang during January 2018 until the number of samples was fulfilled. (2) Willing to participate in research by signing informed consent. Exclusion criteria: (1) Patients with anatomic abnormalities (oral to oesophagal), (2) Patients with previous stroke history, (3) Patients with a history of dysphagia before having a stroke, (4) Stroke patients with decreased consciousness and intubated.

Samples were taken by consecutive sampling at the Inpatient and Outpatient Installation of the Department of Otolaryngology and the Department of Neurology of general hospital Dr Mohammad Hoesin Palembang from January 2018 to February 2018. Researchers chose as many samples as possible according to the inclusion and exclusion criteria, with a minimum number of samples to be collected, 40 people. Descriptive analysis in the form of numerical data is presented in a tabular and narrative style.

3. Results

From 40 patients, 25 people experienced dysphagia, where subjects with non-hemorrhagic stroke types were 21 people (52.5%), while hemorrhagic stroke types were four people (10%). The occurrence of leakage of filter porridge was five findings, leakage of rice porridge was eight findings, oatmeal leakage, water, and milk were seven findings each, and biscuit leakage was two findings. The incidence of filtered pulp residues was 12 findings, rice porridge residues were 14 findings, oatmeal residues were 15 findings, water and milk residues were five findings each, and biscuit residues were eight findings. The incidence of penetration of filter

porridge, rice porridge, and biscuits was one finding each, oatmeal penetration was not found, while water and milk penetration were six events each. The aspirations of filter porridge, rice porridge, oatmeal, and biscuits were not found, while water and milk aspirations were seven findings.

Table 1. General characteristics

Gender	Total	Percentage
Male	23	57,5
Female	17	42,5
Total	40	100

Table 2. Age Characteristic

Age	Total	Percentage
17 - 28 years old	1	2,5
29 - 40 years old	3	7,5
41 – 52 years old	7	17,5
53 - 64 years old	18	45,0
65 - 76 years old	9	22,5
77 - 88 years old	2	5,0
Total	40	100

Table 3. Distribution of patients based on stroke type

Stroke	Total	Percentage
Haemorrhage	12	30%
Non-haemorrhage	28	70%

Table 4. Distribution of post-stroke dysphagia based on the type of stroke

Stroke	Dysphagia	Percentage
Haemorrhage	4	10%
Non-haemorrhage	21	52,5%

Table 5. Leakage findings on FEES examination

Leakage	Haemorrhage	%	Non-haemorrhage	%	Total	%
Porridge	0	0	5	12,5	5	12,5
Rice porridge	0	0	8	20	8	20
Oatmeal	0	0	7	17,5	7	17,5
Mineral water	0	0	7	17,5	7	17,5
Milk	0	0	7	17,5	7	17,5
Biscuit	0	0	2	5	2	5

Table 6. Residues Findings on FEES Examination

Residues	Haemorrhage	%	Non-haemorrhage	%	Total	%
Porridge	1	2,5	11	27,5	12	30
Rice Porridge	1	2,5	13	32,5	14	35
Oatmeal	3	7,5	12	30	15	37,5
Mineral water	2	5	3	7,5	5	12,5
Milk	2	5	3	7,5	5	12,5
Biscuit	2	5	6	15	8	20

Table 7. Penetration finding on FEES examination

Penetration	Haemorrhage	%	Non-haemorrhage	%	Total	%
Porridge	0	0	1	2,5	1	2,5
Rice porridge	0	0	1	2,5	1	2,5
Oatmeal	0	0	0	0	0	0
Mineral water	1	2,5	5	12,5	6	15
Milk	1	2,5	5	12,5	6	15
Biscuit	0	0	1	2,5	1	2,5

Table 8. Aspiration finding on FEES examination

Aspiration	Haemorrhage	%	Non-haemorrhage	%	Total	%
Porridge	0	0	0	0	0	0
Rice porridge	0	0	0	0	0	0
Oatmeal	0	0	0	0	0	0
Mineral water	1	2,5	3	7,5	4	10
Milk	1	2,5	3	7,5	4	10
Biscuit	0	0	0	0	0	0

4. Discussions

This study found that post-stroke dysphagia incidence in stroke patients in Palembang RSMH was quite high at 62.5%. The literature states that dysphagia occurs in 50% of patients after stroke.6 This study found a higher number of male samples than women, namely 57.5% of 40 patients and those experiencing post-stroke dysphagia as much as 42.5% of all patients Male. Most sufferers aged range 53-64 years as many as 45% and aged ≥60 as many as 59.5%. Patients were experiencing dysphagia as much as 42.5%. Previous studies do not specifically mention the prevalence of post-stroke sufferers by sex. The age in post-stroke patients with or without dysphagia was not different. The age grouping in this study was determined following previous studies because there was no significance between age and FEES results in post-stroke patients in this study. However, other studies report that dysphagia often

occurs in post-stroke sufferers of men aged over 60 years.6,7

In this study, out of 25 patients who experienced post-stroke dysphagia, 21 were non-hemorrhagic stroke sufferers, only four people suffered from hemorrhagic stroke. This fact might be because the patients were dominated by non-hemorrhagic stroke patients, of which of the 40 stroke sufferers, only 12 had a hemorrhagic stroke, and another 28 were non-hemorrhagic strokes.

The occurrence of leakage of filter porridge was 5 findings, leakage of rice porridge was eight findings, oatmeal leakage, water, and milk were seven findings each, and biscuit leakage was two findings. The incidence of filtered pulp residues was 12 findings, rice porridge residues were 14 findings, oatmeal residues were 15 findings, water and milk residues were five findings each, and biscuit residues were eight findings. The incidence of penetration of filter porridge, rice porridge, and biscuits was one finding each, oatmeal penetration was not found, while water and milk penetration were six events each. The aspirations of filter porridge, rice porridge, oatmeal, and biscuits were not found, while water and milk aspirations were seven findings.

From these findings, it is known that the incidence of food residues is the most FEES finding, which is 37.5% of the total study sample, while aspiration is the least finding, which is 10% of the entire study sample. This residue is caused by the weakness of the tongue's base in helping to put pressure to push and press the food bolus into the oesophagus. This movement is an involuntary function under the control of the brain stem.9 In contrast to other studies that mention patients with stroke obtained images of leakage as much as 94.6% of men and 81.8% of women, the incidence of leakage due to lesions in the brain stem and brain.8-10

This study has not compared the differences in the incidence of FEES findings in hemorrhagic and non-hemorrhagic stroke sufferers because the number of sufferers is still small and disproportionate between hemorrhagic and non-hemorrhagic stroke sufferers. Documentation is less uniform in and filling in the FEES examination datasheet.

5. Conclusion

The incidence of dysphagia in post-stroke patients both hemorrhagic and non-hemorrhagic in the Inpatient and Outpatient Installation of the THTKL Section and the Neurology Section of the Mohammad Hoesin Palembang General Hospital is quite high at 62.5%. The occurrence of food residues is the most FEES findings. At the same time, aspirations are fewest findings. Assessment with FEES in patients with post-stroke dysphagia is essential because it can find the risk of aspiration both before the swallowing process and during the swallowing process and recommend the use of NGT and the type of consistency and appropriate swallowing techniques.

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