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The Effectiveness of Swallowing Maneuvers on Improving the Quality of Life of Neurogenic Dysphagia Patients at Central General Hospital of Dr. Wahidin Sudirohusodo and State College Hospital of Hasanuddin University

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KEYWORDS

Swallow maneuvers, Dysphagia, quality of life

ABSTRACT:

Introduction: Dysphagia is a geriatric syndrome and a common problem in acute stroke patients. Dysphagia occurs in half of stroke patients and has an impact on aspiration pneumonia, dehydration, malnutrition, and a negative effect on quality of life (QoL).

Aim: To determine the improvement in the quality of life of patients with neurogenic dysphagia after swallow maneuver (SM) therapy.

Method: A cross-sectional study in Makassar conducted on May–October 2023. Ten neurogenic dysphagia patients (4 males and 6 females) were participating in SM therapy (for 8 weeks). Bazaz Dysphagia Severity Scale (BDSS) and Flexible Endoscopy Evaluation of Swallowing (FEES) were used to determine the degree of dysphagia. Swallowing Quality of Life Questionnaire (SWAL-QOL) was used to determine the effectiveness of the swallowing therapy. FEES and SWAL-QOL scores before the first therapy session and after the last therapy session were compared using a paired t-test.

Result: Of a total of 10 participants, all (100%) had moderate dysphagia based on BDSS and when examined for FEES, all (100%) of patients had residue. Based on SWAL-QOL, all (100%) of participants had moderate QoL. After the swallowing maneuver, 5 participants (50%) had mild dysphagia, and 4 (40%) participants had no residue anymore. Participants showed a significant improvement in the Swal-QOL (mean score increased from 9 points, $p<0.001$).

Conclusion: The Swallowing Maneuver is effective in improving the QoL of neurogenic dysphagia sufferers by reducing residue in the swallowing process and the severity of dysphagia.

1. Introduction

Bedah Dysphagia is difficulty moving food from the mouth into the stomach. It is considered a common problem in stroke patients. Dysphagia was found in approximately 55% of strokes, and 11% to 13% had persistent dysphagia after six months. Dysphagia has an impact on aspiration pneumonia, dehydration, malnutrition, and mortality rate.[1,2]

Dysphagia management includes combining compensatory strategies to address immediate (e.g., aspiration) and efficient (e.g., residual) swallowing difficulties by changing pharyngeal dimensions, increasing pressure, and/or redirecting bolus flow. Swallowing therapy has an important role in the recovery of neurologic dysphagia, prevention of aspiration, and improvement of quality of life. The swallowing manoeuvre aims to increase swallowing pressure in the oropharyngeal phase, increase the posterior movement of the base of the tongue, and hold the larynx when the larynx is lifted upwards. It would induce activation of the suprahyoid muscle and reduce the opening of the upper oesophageal sphincter and residual pyriform sinus.[3]

Previous studies in normal participants showed an increase in swallowing muscle strength one and a half times when compared with normal people's swallowing techniques.[4] However, there was no significant increase

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when swallowing therapy was applied to stroke patients.[5] Therefore, this study aims to determine the effectiveness of swallowing therapy in improving QoL in neurogenic dysphagia patients admitted to our hospital.

2. Methods

Research design

The study was conducted on consecutive outpatients from tertiary care units (Combined Dr Wahidin Sudirohusodo Hospital and Hasanuddin University Hospital), the age range of 18 years to 60 years. Only those patients (both male and female) were integrated into the research with predetermined criteria: having neurogenic dysphagia and agreeing to do FEES and swallowing manoeuvres. Patients with immunodeficiency syndrome, head-neck carcinoma, altered consciousness, maxillofacial trauma and oesophagal trauma were excluded.

Assessment and Intervention

Bazaz Dysphagia Severity Scale is a screening assessment of the degree of dysphagia regarding the patient's experience (subjective) of solid and liquid foods obtained through a simple history with the following interpretations: no dysphagia, mild dysphagia, moderate dysphagia, severe dysphagia. Flexible Endoscopy Evaluation of Swallowing (FEES) was used to assess the degree of dysphagia. It is an examination of swallowing function using a flexible fiberoptic nasopharyngoscope to assess the ability to provide food with various consistencies and assess whether there are disturbances during the swallowing process. It categorized dysphagia into spillage, residue, penetration, aspiration, and silent aspiration. Participants underwent SM therapy for 8 weeks with several types of training such as effortful swallow, postural change chin tuck, postural change head turn, and postural change head back. QoL was assessed using the Swallowing Quality of Life Questionnaire (SWAL-QOL), which is a multi-item scale with a value range of 0 to 100 m (0-49 was considered poor; 50-70 moderate; and 71-100 was good).

Ethical Clearance

This research carried out actions with permission from participants who met the criteria included as research samples by filling out an informed consent form and were declared to have met the ethical requirements for implementation by the Ethical Commission for Biomedical Research on humans, Faculty of Medicine, Hasanuddin University, Makassar.

Statistical Analytics

Descriptive statistics are presented as mean and standard deviation. Kolmogorov-Smirnov test was used to assess normality for nominal scale data. Paired t-test was used to compare Swal-QOL scores before and after swallowing therapy. A value of $p < 0,05$ is considered as statistically significant. Data analysis was performed by using SPSS (version 25).

3. Results

Demographic data of stroke patients is presented in Table 1. Ten neurogenic dysphagia patients were included in this study (6 females and 4 males). The mean age at onset is 46,7 years. Most of them are non-harmoragic strokes. After therapy, 50% of patients with moderate dysphagia based on BDSS change to mild dysphagia, as shown in Table 2. The FEES of 40% of patients changed from having residue to no residue (Table 2). The mean score of SWAL-QOL after swallowing therapy increases by 9 points (1,6%) [$p < 0,001$] (Table 3).

4. Discussion

The majority of patients in this study were aged 46-55 years. In line with research by Yang C et al[6] on risk factors for neurogenic dysphagia in ischemic stroke patients, it showed that the incidence of neurogenic dysphagia increases with age. As people get older, they are more susceptible to comorbidities and the body's inability to compensate for disease-related swallowing dysfunction.[7,8] However, stroke-induced neurogenic dysphagia occurs due to loss of functional connectivity in the swallowing network, resulting in decreased activation of the affected and contralateral cerebral hemispheres. Damage to the dominant cerebral hemisphere is associated with a higher risk of dysphagia and aspiration.[9]

The effectiveness of swallowing therapy in neurogenic dysphagia is proven. In this study, all participants had moderate dysphagia and improved to mild dysphagia after SM. A previous study by Xue R et al[10] used the Bazaz Scale to determine the degree of dysphagia in a sample of 70 patients after Anterior Cervical Discectomy

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and Fusion surgery; the results were 50 samples in the mild category, 17 samples in the moderate category and 3 samples in the severe category. After 12 months of follow-up, dysphagia was reduced to 4 samples, 3 of which were in the mild category and 1 sample in the moderate category. This subjectively proves that the Bazaz Dysphagia Severity Scale is effective in assessing dysphagia symptoms. This instrument is also helpful when objective assessment (FEES, Videofluoroscopy, barium esophagography) is inadequate for a complete diagnosis of dysphagia.[11]

Gaspar M et al[12] showed that patients with neurogenic dysphagia had a worse quality of life compared to the control group. Likewise, research by Arslan S et al[13] shows that neurogenic dysphagia patients have a poor quality of life. Apart from that, this research also shows that the lower the severity of dysphagia, the more the quality of life will decrease. In this study, the quality of life of 5 participants (50%) increased from the moderate category to good, and another participant (50%) did not change. There was a significant increase in the mean SWAL-QOL score after the SM therapy of 60,7 to 69,7 (2.3%) (p=0.001). The results of this study are in line with the research of Bahceci K et al[14] about the existence of an early rehabilitation program, including swallowing manoeuvres, improved the quality of life of patients with neurogenic dysphagia due to cortical ischemic stroke in 72 samples. There was a significant increase in the mean SWAL-QOL score after the swallowing manoeuvre of 53. 5 to 68.9; there was an increase in the score of 15.4 (2.3%) (p=0.001). Ayres A et al[15] study also showed that there was an increase in the quality of life of patients with neurogenic dysphagia due to Parkinson's Disease. In 10 samples, there was an increase in the mean SWAL-QOL score on the swallowing manoeuvre from 64.24 to 74.34; there was an increase in score of 10.1 (1.3%) (p=0.03). The earlier swallowing manoeuvre therapy is given, the greater the improvement obtained after therapy. Swallowing manoeuvres in patients with neurogenic dysphagia due to stroke performed in the acute phase (7 days) and sub-acute (< 6 months) can improve swallowing ability, thereby reducing the proportion of patients with dysphagia.[16] In this study, the swallowing manoeuvre was carried out during the sub-acute phase so that the muscles, nerves, and other organs that were disturbed during the swallowing process could function again, and the patient's quality of life would be better.

There was an improvement in FEES findings (of the 10 people with residue, 4 of them had no residue left). The presence of FEES findings after the SM therapy cannot be separated from repeated strokes, bleeding and compression of the brain, and other neurological disorders that cause total body paralysis, as well as patient compliance in carrying out the swallowing manoeuvre. Previous study observed about the head-lift manoeuvre therapy for 8 weeks on 10 patients, which 6 patients suffered from Head and Neck Cancer, and 4 patients were diagnosed with stroke. After carrying out this manoeuvre, it was found that there was an improvement in swallowing function in the form of a loss of residue in the post-manoeuvre.[17] Likewise, in the study by Gandhi P et al[18] showed swallowing manoeuvres were given 5 days/week for 4 weeks in 8 samples of sufferers of neurogenic dysphagia due to Parkinson's. Disease improves FEES findings, namely residue and penetration.

The limitations of this study are the cross-sectional study design, small sample size, and lack of long-term follow-up after discharge.

5. Conclusion

Older adults are more susceptible to comorbidities and the body's inability to compensate for disease-related swallowing dysfunction. The Swallowing Maneuver is effective in improving the QoL of neurogenic dysphagia sufferers by reducing residue in the swallowing process and the severity of dysphagia.

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Attachment

Table 1. Characteristics of the participants

Characteristics	Frequency(n=10)	Percentage (%)
Age, years, mean	**46,7**	
< 45 tahun	3	30,0
46-55 tahun	5	50,0
> 55 tahun	2	20,0
Gender, n (%)		
Male	12	40.0
female	18	60.0
Brain lesion		
Hemorrhagic Stroke	11	36.7
Non-hemorrhagic Stroke	19	63.3
Posterior fossa arachnoid cyst		
multiple cranial nerve palsy		

Table 2. Comparison of functional outcome before and after swallowing therapy

Functional outcome	Pre		Post	
	n (10)	%	n (10)	%
BDSS				
Mild	0	0	5	50
Moderate	10	100	5	50
Severe	0	0	0	0
FEES				
Residue	10	100	6	60
Penetration	0	0	0	0
Aspiration	0	0	0	0
Spillage	0	0	0	0

Table 3. Comparison of QoL before and after swallowing therapy

SWAL-QOL	n	Mean	SD	Increasement	P
Pre	10	60,7	6,1	9,0 (1,6%)	<0,001*
Post	10	69,7	8,2		

*Paired T-Test