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Effectiveness of Shaker's exercise in improving swallowing ability among cerebrovascular accidents patients with dysphagia

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Abstract

Stroke is the second leading cause of death, amongst persons above 60 years of age, the 5th leading cause of death amongst 15-59-year-old population and the leading cause of disability worldwide. 17 million people worldwide suffer a stroke each year of which 6.2 million will die and 5 million will remain permanently disabled. 70% of these strokes and 80% of stroke deaths occur in lower and middle income countries including India due to a double of preventive strategies and poor organization of stroke management facilities with resultant non-availability of acute stroke management to the larger and semi-urban population. The present study aims to Effectiveness of shaker's swallowing exercise in improving swallowing ability among Cerebrovascular Accident patients with dysphagia at selected SIMATS, Chennai. A quantitative research approach -with quasi Experimental research design was used to conduct study at Saveetha Medical College and Hospital. 30 samples were selected by using a purposive sampling technique. The Samples were divided into two groups, 15 samples in Experimental Group and 15 samples in Control group. Semi structured interview method was used to collect the demographical variables among stroke patient, patients swallowing ability was assessed by using gugging swallowing screen scale (GUSS). the pretest mean score of level of dysphagia in the experimental group was 12.93 ± 2.05 whereas the pretest mean score of level of dysphagia in the control group was 12.27 ± 1.44 the unpaired, t value of $t = 6.413$ was found to be statistically significant which clearly indicates that there was difference in the level of dysphagia in the experimental and control group. This study proves Effectiveness of shaker's swallowing exercise in improving swallowing ability among Cerebrovascular Accident patients with dysphagia.

Keywords: Shaker exercise, dysphagia, swallowing ability, stroke patient

Introduction

Stroke, or brain attack, is the number four killer of adult in the world. In the United States, 160,000 deaths occur year from stroke gradually lowered as improvements to medicine and testing developed. Yet, 800,000 Americans continue to have stroke and survive the event. Worldwide, about 15 million experience stroke with 6 million who die cerebrovascular accident is one of the preeminent reason leading to mortality and morbidity throughout the world. Every year nearly 20 million people are diagnosed with CVA. Out of them, 5 million death occurs due to consequences and 15 million survives; among those who survive, 5 million are disabled because of CVA ^[1].

Dysphagia is one of the most common complications, which may occur after a stroke, and it occurs to approximately 37-78% of patient with a stroke. This may lead to a degraded quality of life, as well as cause malnutrition, dehydration, and severe aspiration pneumonia. Severe aspiration pneumonia. Severe aspiration pneumonia is life - threatening, and possibly lead to death. Several reports showed that stroke-induced was naturally resolved, but according to Howard *et al.*, 30% of stroke patient's required sustained parenteral nutrition or percutaneous endoscopic gastrostomy, which decreased the overall quality of life. This may result in reduced efficacy of rehabilitation and prolonged hospitalization with negative economic and emotion impacts, and thus, there is a critical need for treatment. Dysphagia after stroke may involve difficulties with both the oral and pharyngeal phases of swallowing ^[2]. Persistent dysphagia can result in an excess production of saliva drooling, coughing or choking during eating, and even difficulty speaking or a hoarse voice. These signs associated with poor outcome and increased mortality and morbidity due to dysphagia complication as aspiration pneumonia, dehydration, malnutrition and death ^[3].

There has been more than 100 percent increase in incidence of stroke in low and middle-income countries including India from 1970-1979 to 2000-2008. Lack of reliable reporting mechanisms, heterogeneity in methodology, study population and sample size in existing studies, make an accurate estimation of stroke burden in India challenging. We conducted a systematic review of epidemiological studies on stroke conducted in India to document the magnitude of stroke.

After the age of 55, the risk of stroke is double (Brunner & Day, 2010). Despite advances in stroke management post stroke complication occur. Nurses must focus on developing successful strategies to promote home and community based care for victims of completed stroke in order for them to resume their daily life as safely and independently as possible. Strategies must target prevention of future strokes, since a stroke survivor has a 20% chance of having another stroke within 2 years, and care management after the cerebrovascular accident. Effective strategies must be aimed at restoring patient's independence by improving physical, mental and emotional function.

Cerebrovascular accident (CVA) is the medical term for a stroke. A stroke is when blood flow to a part of your brain is stopped either by a blockage or the rupture of a blood vessel. There are important signs of a stroke that you should be aware of and watch out for. Seek medical attention immediately if you think that you or someone around you might be having a stroke. The more quickly you receive treatment, the better the prognosis, as a stroke left untreated for too long can result in permanent brain damage.

Stroke is the second most common cause of mortality worldwide and the third most common cause of disability [4]. There are many types of stroke; ischemic, intracerebral and subarachnoid haemorrhage. In the US, the proportion of ischaemic strokes, intracerebral haemorrhage and subarachnoid haemorrhage is 87%, 10% and 3% respectively [5]. Stroke has already reached epidemic proportions. Globally 1 in 4 adults over the age of 25 will have a stroke in their lifetime. 13.7 million people worldwide will have their first stroke this year and five and a half million will die as a result. Current trends suggest that the number of annual deaths will climb to 6.7 million annually without appropriate action. Stroke is leading cause of death and disability globally with 116 m years of healthy life lost each year to the disease. Nearly 14 million people will have a stroke this year and around 5.5 million people will die as a result. Stroke can have different short- and long-term effects depending on which part of the brain is affected and how quickly it is treated.

The shaker exercise is a sustained and repetitive and head lifting exercise to increase the strength of infra thyroid and supra thyroid muscular activity. Shaker exercise includes isometric and isotonic exercise. Isometric exercise it is performed by raising the head of the patient for 60 seconds and followed by a minute rest for a repetition of the three times and isotonic exercise are performed by thirty repetition of alternative up and down movement of the head. It enhance the thyroid muscle contraction and it gives strength to the supra thyroid muscle, facilitate the upward and forward movement of the larynx and thereby opens the upper esophageal sphincter [6].

Shaker exercise also strengthen the infra hyoid and suprahyoid muscular activity and reduce pyriform sinus residue muscular activity.

This exercise has been generally used in case of oropharyngeal dysphagia due to abnormal UES opening [7]. Ade Sucip *et al.*, 2019 conducted a study to evaluate the "effectiveness of application of shakers technique and swallow exercise towards dysphagia in stroke patients" Dysphagia experienced by sufferers occurs because of interference with the control of innervation during the process of swallowing where the therapy aims to provide a stimulus. True experiment with a pre-test post-test Technique Probability sampling with method simple random sampling is used to get 48 respondents were divided into three groups. Statistical test results One Way ANOVA shows a p value 0.000 (<0.05) which means that there is an influence of the application of techniques shaker and swallowing exercises to increase the status of swallowing stroke patients with dysphagia. The results of the study after being given nursing action resulted in an increase in swallowing status in patients.

Ji-Su Park *et al.*, (2018) conducted a study to evaluate the "effect of chin tuck against resistance exercise on patients with dysphagia following stroke: randomized pilot study" CTAR has been reported has remedial treatment for pharyngeal dysphagia. The study investigated the effect of CTAR swallowing function in patients with dysphagia following sub-acute stroke. The patients were randomly assigned to an experimental (n = 11) or a control group (n = 11). The experimental group performed CTAR using the CTAR device. The control group receives only conventional dysphagia treatment. Functional Dysphagia scale and penetration aspiration scale. Based on video fluoroscopic swallowing study. The experimental showed more improvement in the oral cavity, laryngeal elevation/epiglottic closure, residue in valleculae, and residue in pyriform sinuses of FDS and PAS compared to the control group (p<0.05, al).

Methods and Materials

A quantitative research approach-with quasi Experimental research design was used to conduct study at Saveetha Medical College and Hospital. 30 samples were selected by using a purposive sampling technique. The Samples were divided into two groups, 15 samples in Experimental Group and 15 samples in Control group. The inclusion criteria for clients with stroke leading to Understand Tamil or English and willing to participate in the study Have moderate swallowing difficulty (9-14) score. Have Glasgow Coma Scale (GCS) score of 13-15 are on liquid diet. Those having mild and severe swallowing ability included in the study. The Severe swallowing difficulty patients, Those had surgery of the head and neck, congestive cardiac failure and end stage renal disease were excluded from the study.

The data collection period was done with prior permission from the Institutional Ethical committee, Saveetha Medical College and Hospital. The purpose of the study was explained to the samples and written informed consent was obtained from Both Experimental and Control Group. The demographic data were collected, structured interview questionnaire regarding stroke, and then the Pre-test of stroke swallowing ability of Stroke patient was assessed with the use of gugging screening Scale (Direct and Indirect Swallowing was assessed) For Experimental Group. Then the Patient was taught about Shaker's swallowing Exercise is the training helps to improve swallowing ability among CVA patients with dysphagia. SHAKERS Exercise is

repeated for 3 times per session for 3 sessions per day for consecutive 8 days. For Control Group Routine measures for Dysphagia was Done.

- Repeat the Exercise for three times per session
- Three session per day for Eight consecutive Days to be Done

Shakers exercise

- Lay flat on your back on the floor or bed.
- Hold your head off the floor looking at your feet
- Raise the Head up for 60 seconds followed by rest for a minute

Post-test was Done by using a GUSS (Gugging Swallowing Screen scale) for Dysphagia was used.

Results and Discussion

Table 1: Frequency and percentage distribution of demographic variables among CVA patients in experimental and control group

Demographic variables	Experimental group n = 15		Control = 15	
	No	%	No	%
Age				
45- 55 years	8	53.3	2	13.3
56-65 years	2	13.3	8	53.3
66-75 years	3	20	2	13.3
76-85 years	2	13.3	3	20
Gender				
Male	13	86.67	14	93.3
Female	2	13.3	1	6.67
Education				
Illiterate	1	6.67	6	40
Elementary	10	66.67	6	40
SSLC	3	20	3	20
Degree	1	6.67	-	-
Income (per month)				
<5000	1	6.67	7	46.6
5000 - 10000	10	66.6	7	46.6
10000 - 15000	3	20	1	6.67
>15000	1	6.6	-	-
Occupation				
House wife	2	13.3	2	13.3
Coolie	7	46.6	5	33.3
Farmer	2	13.3	1	6.67
Unemployed	-	-	2	13.3
Business	3	18.8	5	33.3
Professional	1	6.67	-	-
Types of stroke				
Ischemic stroke	13	86.7	11	73.3
Hemorrhagic stroke	2	13.3	4	26.7
Diagnosis				
Right hemiparesis	3	20	7	46.6
Right hemiplegia	6	40	4	26.67
Left hemiparesis	2	13.3	1	6.67
Left hemiplegia	4	26.7	3	20
Cause of stroke				
Ischemic	13	86.67	10	66.7
Hemorrhage	2	13.3	5	33.3
Duration of stroke				
<5 days	13	86.67	6	40
5 -10 days	2	13.3	2	13.3
10-15 days	-	-	1	6.67

The table 1 reveals that half of the patients in the intervention group, 6 (37.5%) in comparison group belongs to 45-55 years of age. Most of the patients 28 (87%) were males. Most of the patients 11 (68.75%) in intervention group and 6 (37.5%) from comparison group had completed their elementary school education. Majority of their family monthly income falls into the category of 5000 - 10000. Both in intervention 8 (50%) and comparison group 5 (31.2%) most of them were coolie. that most of them 6

(40%) in the intervention group were diagnosed as right hemiplegia and in the comparison group 7 (46.6%) of them were with right hemiparesis. Among 15 (100%) patients in the intervention group 13 (86.67%) of them were found with ischemia as a cause of stroke and the duration of stroke is less than 5 days. In the comparison group 9 (60%) of them in each group were with hypertension as associated illness. And in the intervention group 8 (53.3%). None of them have the family history of stroke.

Table 2: Frequency and percentage distribution of dysphagia symptoms present among CVA patients in experimental and control group n = 30

Symptoms present among CVA patie		Experimental group n = 15		Control group n = 15	
		f	%	f	%
Drooling	Present	1	6.67	3	20
	Absent	14	93.3	12	80
Coughing	Present	15	100	14	93.3
	Absent	-	-	1	6.67
Choking	Present	-	-	-	-
	Absent	15	100	15	100
Difficulty in swallowing	Semisolid	15	100	12	80
	Liquid	-	-	2	13.3
	Solid	-	-	1	6.67
Pain on swallowing	Present	14	93.3	2	13.3
	Absent	1	6.67	13	86.67
Weight Loss	Present	8	53.3	7	46.6
	Absent	7	46.6	8	53.3
History of Aspiration	Present	-	-	1	6.67
	Absent	15	100	14	93.3

Table 2 describes the symptoms presented by CVA patients regarding their swallowing ability. In the intervention group among 15 patients, drooling was absent in 14 (93.3%) patients so choking was also absent among all patients. All of them were having cough and mostly difficulty in

swallowing semisolid diet 15 (100%). None of them had a history of aspiration. In comparison group 12 (80%) of them were with difficulty in swallowing for semisolids and 7 (46.6%) has weight loss.

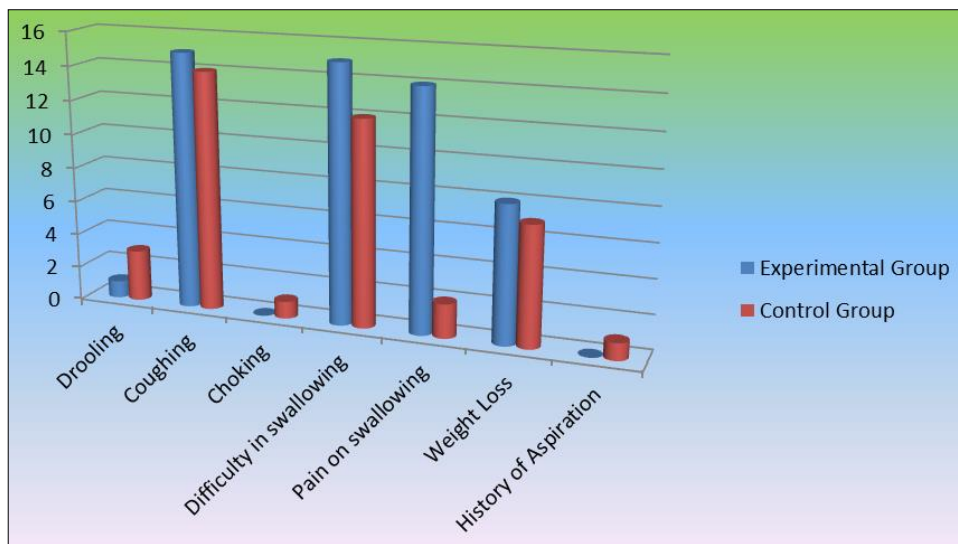


Fig 1: Describes the symptoms presented by CVA patients regarding their swallowing ability

Table 3: Frequency and percentage distribution of pre-test level of dysphagia among CVA patients in experimental group

Guss score	No dysphagia		Mild dysphagia		Moderate dysphagia		Mean	S. D.
	No	%	No	%	No	%		
Pre-test	0	0%	0	0%	15	100%	12.93	2.05
Post-test	13	86.7%	2	13.3%	0	0%	17.27	1.62

Table 3 shows that 15 (100%) has moderate dysphagia in pre-test, 2 (13.3) had mild dysphagia and 13 (86.7%) of

them had progressed to no dysphagia in post-test and 2 (13.3%) remains in mild Dysphagia.

Table 4: Comparison of pre-test and post-test level of Dysphagia among CVA Patients between experimental and control group

Test	Experimental group		Control group		Student independent 't' test
	Mean	S.D.	Mean	S.D.	
Pre test	12.93	2.05	12.27	1.44	T = 6.413, P = 0.001
Post test	17.27	1.62	12.87	0.20	T = 24.55, P = 0.0001

The table 4 reveals that the pretest mean score of level of dysphagia in the experimental group was 12.93 ± 2.05 whereas the pretest mean score of level of dysphagia in the

control group was 12.27 ± 1.44 the unpaired "t" value of t = 6.413 was found to be statistically significant which clearly indicates that there was difference in the level of dysphagia

in the experimental and control group. Whereas the post-test mean level of dysphagia in the experimental group was 17.27 ± 1.62 . Whereas the posttest mean level of dysphagia in the control group was the 12.87 ± 0.20 the calculated unpaired t value of $t = 24.55$ was found to be statistically significant at $P < 0.001$ level. This clearly indicates that after the administration of shakers exercise among CVA patients with dysphagia in the experimental than the control group.

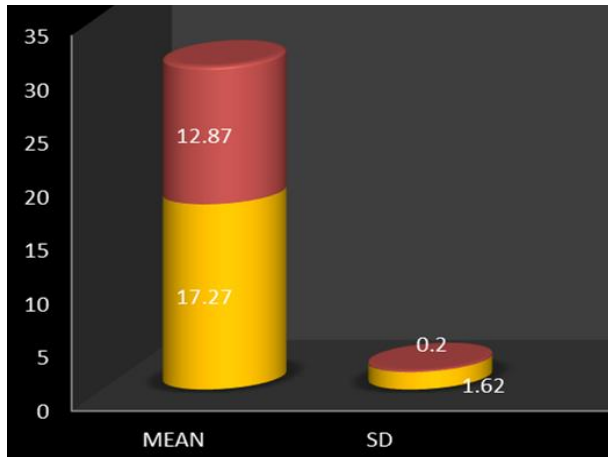


Fig 2: Post-test of experimental and control group

Conclusion

This study proves that, the Effectiveness of shaker's swallowing exercise in improving swallowing ability among Cerebrovascular Accident patients with dysphagia at selected SIMATS. So the shaker exercise was effective in improving swallowing ability among stroke patients.

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Author's contribution

All the authors actively participated in the work of the study. All authors read and approved the final manuscript.

Conflicts of interest

The authors declare no conflicts of interest.

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