"A STUDY TO ASSESS THE EFFECTIVENESS OF DYSPHAGIA EXERCISE ON SWALLOWING ABILITY AMONG PATIENTS WITH CEREBROVASCULAR ACCIDENT IN SELECTED HOSPITALS AT GUWAHATI KAMRUP (M), ASSAM."

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ABSTRACT:

Introduction- Cerebrovascular accident (CVA), commonly known as a stroke, is a leading cause of death and disability globally, resulting in significant healthcare costs and prolonged hospital stays. A CVA occurs when blood supply to the brain is disrupted, leading to a sudden loss of various functions, including neuromotor, intellectual, sensory, and communication abilities. There are two main types of strokes: ischemic and hemorrhagic. **Objective-** To assess the effectiveness of dysphagia exercise on swallowing ability among patients with Cerebrovascular Accident. **Methodology**- A quantitative research approach with pre-experimental one group pretest posttest design was used in the study with a sample size of 60 participants who met inclusion and exclusion criteria. Non-probability purposive Sampling technique was used conducted in 3 hospitals of Guwahati, Assam. Data was collected using demographic and clinical variables and the tools consisted of GUSS (Gugging Swallowing Screen) and FOIS (Functional Oral Intake Scale). Data was analysed using descriptive and inferential statistics. **Result**- On assessing the level of dysphagia on swallowing ability among patient with CVA, pre-test majority 34(56.7%) had moderate dysphagia, 18(30%) had severe dysphagia and 8(13.3%) had mild dysphagia where as in post-test maximum 31(51.7%) had mild dysphagia, 24(40%) had moderate dysphagia and 5(8.3%) had severe dysphagia among patient with Cerebrovascular Accident. On evaluating the effectiveness of dysphagia exercise on swallowing ability showed that post-test mean score was 15.01±3.28 was higher than pre-test mean score was 11.21±3.98 with mean difference was 3.80. The effectiveness was tested using paired t test with obtained ($t=13.15$) at $df=59$ was statistically significant at $p<0.01$ level. And x2 test between the dysphagia exercise on swallowing ability with demographic variables revealed age, history of comorbidity, previous history of stroke and type of paralysis were found significant association at $p<0.05$. Whereas, gender, educational status, diet, marital status, occupation, family monthly income, residence, duration of hospital stay, family history of CVA, history of hypertension, history of smoking, duration of hypertension and any other treatment taken previously were found to be statistically non-significant at $p<0.05$ with dysphagia exercise on swallowing ability among patient with Cerebrovascular Accident. **Conclusion-** The conclusion obtained from the present study was that most of the patients who were diagnosed with Cerebrovascular Accident had difficulty in swallowing and after receiving dysphagia exercise there was a significant improvement in swallowing ability. It concluded that dysphagia exercise is effective on CVA patient who had difficulty in swallowing.

Keywords- Assess, Effectiveness, Swallowing Ability, Dysphagia Exercise, CVA and Hospital.

THE BACKGROUND OF THE STUDY:

CVA which is known as Cerebrovascular accident is one of the major cause of disability and death in the world and is related with many medical complications undoubted causing prolonged hospital stay and increased health care costs.[1] CVA covers a broad term that refers to a functional abnormality of the central nervous system that occurs when the brain does not get adequate blood supply.[2] It happens when the functions are suddenly loss resulting from interruption of blood supply to the brain due to which many body functions like, sensory, intellectual, neuromotor activity, communication functions and elimination.1 An impulsive start and lasting more than 24 hours is a neurologic deficit.[3]

Neurologic changes is a term used to describe stroke caused by disrupting the blood supply to the brain also called as cerebrovascular accidents. Cerebrovascular disorders, and more recently known as, "brain attack". There are two types of strokes, ischemic stroke and hemorrhagic stroke. Ischemic stroke is a blockage of blood supply to the brain caused by a thrombotic or embolic blockage. Hemorrhagic strokes are when the brain tissue or sub arachnoid space are bleeding. Ischemic strokes report for approximately 80 to 85% of all strokes. The remaining 15 to 17% are of hemorrhagic stroke.4 The two different kinds of strokes have certain similarities, but they differ in their genesis, pathophysiology, medical and surgical management, and nursing care.[2]

NEED OF THE STUDY:

Stroke is one of the leading causes of death and disability in India. The estimated adjusted prevalence rate of stroke range, 84-262/ 100,000 in rural and 334-424/ 100,000 in urban areas. The incidence rate is 119-145/100,000 based on the recent Population based studies.[18]

Assam in Northeast India had 2229 stroke DALYs per 100,000 population, which was almost double that of the 1234 stroke DALYs for India as a whole.19 A Hospital based study on the epidemiology of stroke in Assam reported poor awareness of warning symptoms and risk factors of stroke.[20]

Various authors have tried to assess the impact of dysphagia exercise on a wide variety of clinical outcomes and also correlated clinical dysphagia with the risk of rising chest Infections. In the studies conducted by Kidd D et al (1995) and Holas et al (1994), it was found that there is an increased risk of chest infection and in the initial stage aspiration is the most common following acute stroke as a result of dysphagia.[21]

Therefore, the need has been felt on the topic to study on the effectiveness of dysphagia exercise on swallowing ability among patient with cerebrovascular accident in selected hospitals of Guwahati since difficulty in swallowing is one of the most common symptoms and many are not aware of the exercises for swallowing, which can be really helpful for patient to improve in its swallowing ability.

RESEARCH METHODOLOGY:

This study was conducted to assess the effectiveness of the effectiveness of dysphagia exercise on swallowing ability among patients with cerebrovascular accident.

RESEARCH APPROACH- In order to achieve the objectives of the study a Quantitative approach was found to be appropriate and selected for the study.

RESEARCH DESIGN- A pre-experimental design (one group pre-test and post-test design) was adopted.

SETTING OF THE STUDY- The study was conducted at three selected hospitals in Guwahati, Assam.

1. GNRC (Guwahati Neurological Research Centre) Medical, Six-mile Branch.
2. GNRC (Guwahati Neurological Research Centre) Medical, Dispur Branch.
3. GNRC (Guwahati Neurological Research Centre) Medical, North Guwahati Branch.

POPULATION- The population of the study were Cerebrovascular Accident Patients in selected hospitals at Guwahati, Assam.

SAMPLE SIZE- The total sample size of the study was 60.

SAMPLING TECHNIQUE- Non-probability purposive Sampling Technique was used.

THEORETICAL FRAMEWORK:

The conceptual framework applied for this study was based on Modified Ludwig Von Bertalanffy's General System Theory.

TOOLS OF DATA COLLECTION:

Based on the objectives of the study,

Tool-1: Demographic perfoma

Tool-2: Consists of Gugging Swallowing Screen (GUSS) and Functional Oral Intake Scale (FOIS).

Phase 1: Pre-test: Using GUSS (Gugging Swallowing Screen) and FOIS (Functional Oral Intake Scale) pre-test was done on the client.

Phase 2: Intervention: Dysphagia Exercise was given using Chin tuck Against Resistance exercise 2 time a day for 5 continuous days for 5 min.

Phase 3: Post-test: On the 7th day post-test was done using the tools GUSS and FOIS.

DATA ANALYSIS: Descriptive and inferential statistics

RESULTS: Analysis of the collected data was done using SPSS version 18 Version.

Table 1: Frequency and percentage distribution of demographic variables.

n=60

S. No	Demographic Variables	frequency	Percentage
1	**Age in years**		
	a. Less than 40 years	4	6.7
	b. 40-50	14	23.3
	c. 51-60	15	25
	d. Above 60 years	27	45
2	**Gender**		
	a. Male	47	78.3
	b. Female	13	21.7
3	**Educational status**		
	a. No formal education	1	1.7

	b. Primary education	15	25
	c. Secondary education	18	30
	d. Higher secondary education	3	5
	e. Graduate and above	23	38.3
4	**Diet**		
	a. Vegs	11	18.3
	b. Non vegs	49	81.7
5	**Marital status**		
	a. Married	50	83.3
	b. Unmarried	1	1.7
	c. Widower	9	15
	d. Divorced/separated	0	0
6	**Occupation**		
	a. Professional	10	16.7
	b. Semi-professional	5	8.3
	c. Clerical/shop/farmer	9	15
	d. Skilled worker	26	43.4
	e. Semi-skilled worker	8	13.3
	f. Unskilled worker	0	0
	g. Unemployed	2	3.3
7	**Family Monthly income**		
	a. ≥ 20,482	34	56.6
	b. 10,241-20481	22	36.7
	c. 7681-10240	3	5
	d. 5120-7680	1	1.7
	e. 3072-5119	0	0
	f. 1034-3071	0	0
	g. ≤ 1033	0	0
8	**Residence**		
	a. Urban	49	81.7
	b. Rural	11	18.3
9	**Duration of hospital stay**		
	a. Less than 1 month	40	66.6
	b. 1-2 months	16	26.7
	c. More than 2 months	4	6.7
10	**Family history of CVA**		
	a. Yes	11	18.3
	b. No	49	81.7
11	**History of Hypertension:**		
	a. Yes	47	78.3
	b. No	13	21.7

12	**History of smoking**		
	a. Yes	21	35
	b. No	39	65
13	**History of comorbidity:**		
	a. Diabetes	16	26.7
	b. Cardiovascular disease	4	6.7
	c. Atherosclerosis	0	0
	d. No history	40	66.6
14	**Duration of Hypertension:**		
	a. No Hypertension	16	26.7
	b. Less than 1 year	3	5
	c. 1-2 years	5	8.3
	d. More than 2 years	36	60
15	**Previous history of stroke:**		
	a. Yes	16	26.7
	b. No	44	73.3
16	**Any other treatment taken previously:**		
	a. Yes	28	46.7
	b. No	32	53.3
17	**Types of paralysis:**		
	a. Monoplegia	13	21.7
	b. Hemiplegia	36	60
	c. Paraplegia	0	0
	d. Quadriplegia	0	0
	e. None	11	18.3

Table 2: Frequency and percentage distribution of pretest and posttest level of dysphagia on swallowing ability among patient with Cerebrovascular Accident.

n=60

Level of dysphagia	**Pre-test**		**Post-test**	
	f	**%**	**f**	**%**
Mild dysphagia	8	13.3	31	51.7
Moderate dysphagia	34	56.7	24	40
Severe dysphagia	18	30	5	8.3

Table 2: This table depicts that during pre-test majority 34(56.7%) had moderate dysphagia, 18(30%) had severe dysphagia and 8(13.3%) had mild dysphagia where as in post-test maximum 31(51.7%) had mild dysphagia, 24(40%) had moderate dysphagia and 5(8.3%) had severe dysphagia among patient with Cerebrovascular Accident. So, hypothesis is accepted.

n=60

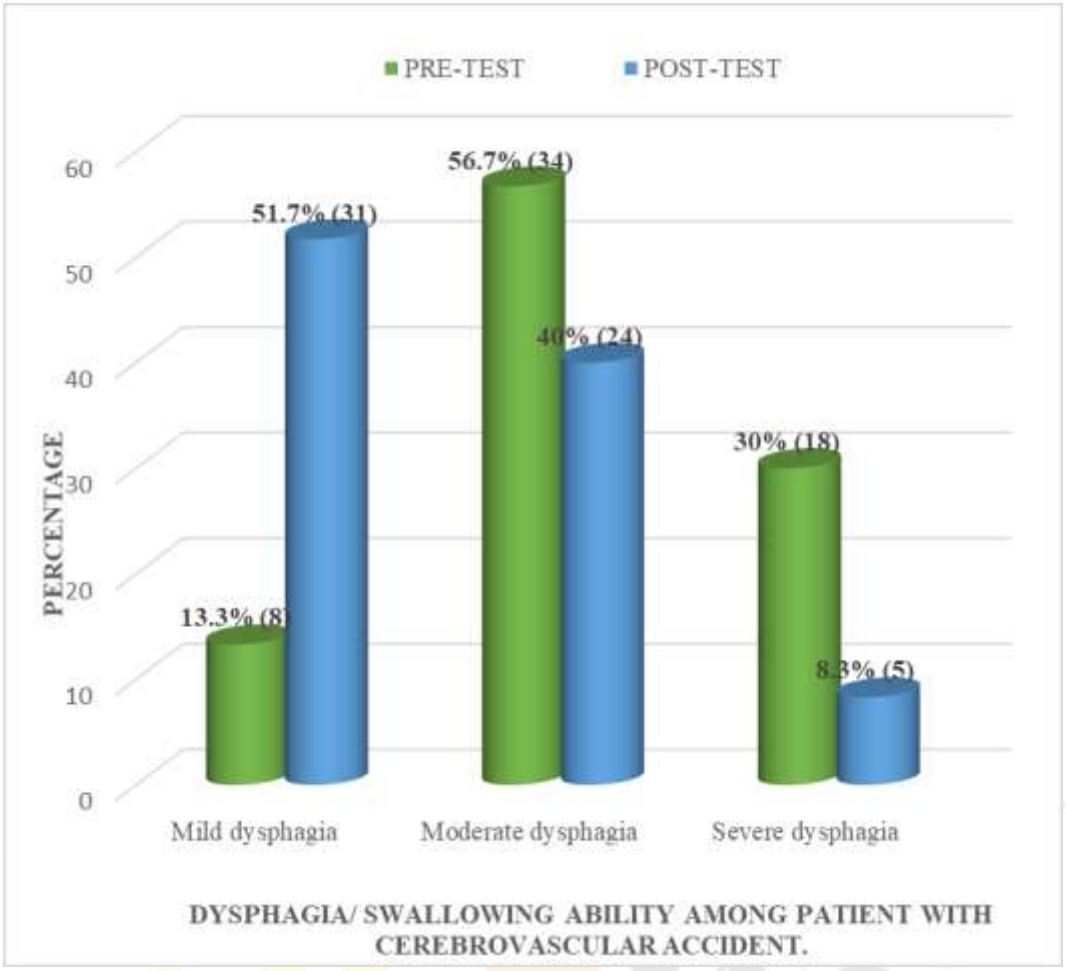

Figure 1: Frequency and Percentage distribution of pretest and posttest level of dysphagia on swallowing ability among patient with Cerebrovascular Accident.

Table 3: Frequency and percentage distribution of pretest and post-test level of functional oral intake among patient with Cerebrovascular Accident.

n=60

Functional oral intake	**Pre-test**		**Post-test**	
	f	**%**	**f**	**%**
Patient on total NG feeding.	0	0	0	0
Patient on NG feed with minimal food trials of semisolid consistency and can move on to liquids if tolerated.	0	0	0	0
Patient on NG feed with consistent oral intake, can take water the food through the throat. Meals take extra time (>1 hour).	27	45	14	23.3

Patient on diet with single consistency (ground/ pureed from otherwise called semisolid) but can drink water.	21	35	20	33.4
Patient on diet with multiple consistencies, Diet can be prepared using blender.	8	13.3	14	23.3
Patient on diet with multiple consistencies (pureed/grounded/chopped/regular). Except salad, rice, meat, bread.	4	6.7	8	13.3
Patient on regular diet without any restrictions.	0	0	4	6.7

Table 4: Effectiveness of dysphagia exercises on swallowing ability among patient with Cerebrovascular Accident.

n=60

Dysphagia	Mean	SD	Mean Difference	t- value	df	p value
Pre-test	11.21	3.98	3.80	13.15	59	**0.001***
Post-test	15.01	3.28				

***P<0.05 level of significance** **NS-Non significant**

Table 4: Depicts the effectiveness of dysphagia exercises on swallowing ability among patient with Cerebrovascular Accident. Result showed that post-test mean score was 15.01±3.28 was higher than pre-test mean score was 11.21±3.98 with mean difference was 3.80. The effectiveness was tested using paired t test with obtained (t=13.15) at df=59 was statistically significant at p<0.01 level. Findings revealed that dysphagia exercises had improved swallowing ability among patient with Cerebrovascular Accident. So, hypothesis is accepted.

Table 5: Effectiveness of dysphagia exercises on functional oral intake among patient with Cerebrovascular Accident.

n=60

Functional oral intake	Mean	SD	Mean Difference	t- value	df	p value
Pre-test	3.81	0.91	0.65	10.46	59	**0.001***
Post-test	4.46	1.18				

***P<0.05 level of significance** **NS-Non significant**

Table 5: Depicts the effectiveness of dysphagia exercises on functional oral intake among patient with Cerebrovascular Accident. Result showed that post-test mean score was 4.46±1.18 was higher than pre-test mean score was 3.81±0.91 with mean difference was 0.65. The effectiveness was tested using paired t test with obtained (t=10.46) at df=59 was statistically significant at p<0.01 level. Findings revealed that dysphagia exercises had improved functional oral intake among patient with Cerebrovascular Accident.

Table 6: Area wise Effectiveness of dysphagia exercises on swallowing ability among patient with Cerebrovascular Accident.

n=60

Components	Pre-test Mean±SD	Post-test Mean±SD	Mean D	t-value	df	p-value
Indirect swallowing	4.83±0.37	5.0±0.0	0.17	3.435	59	0.001*
Semisolid	4.0±1.85	4.88±0.41	0.88	4.179	59	0.001*
Liquid	2.18±1.98	3.75±1.70	1.57	8.702	59	0.001*
Solid	0.20±0.68	1.38±1.71	1.18	6.105	59	0.001*

***P<0.05 level of significance** **NS-Non significance**

Table 6: Illustrates the Area wise Effectiveness of dysphagia exercises on swallowing ability among patient with Cerebrovascular Accident which was tested by using paired t test.

Result on indirect swallowing showed that post-test mean score was 5.0±0.0 higher than pre-test mean score was 4.83±0.37 with mean difference was 0.17 with calculated value (t=3.435) at df=59 was statistically significant at p<0.01 level.

Regarding swallowing of semisolid revealed that post-test mean score was 4.88±0.41 higher than pre-test mean score was 4.0±1.85 with mean difference was 0.88 with calculated value (t=4.179) at df=59 was statistically significant at p<0.01 level.

As per liquid swallowing of liquid revealed that post-test mean score was 3.75±1.70 higher than pre-test mean score was 2.18±1.98 with mean difference was 1.57 with calculated value (t=8.702) at df=59 was statistically significant at p<0.01 level.

With regard to swallowing of solid revealed that post-test mean score was 1.38±1.71 higher than pre-test mean score was 0.20±0.68 with mean difference was 1.18 with calculated value (t=6.105) at df=59 was statistically significant at p<0.01 level.

Table 7: Association between dysphagia exercise on swallowing ability among patient with Cerebrovascular Accident with demographic variables.

n=60

S. No	Demographic variables	Post-test level of dysphagia			χ^2 value	df	p value
		Mild	Moderate	Severe			
1	**Age in years**						
	a. Less than 40 years	4	0	0	16.72	6	0.010*
	b. 40-50	2	9	3			
	c. 51-60	7	6	2			
	d. Above 60 years	18	9	0			

2	**Gender**						
	a. Male	24	19	4	0.033	2	0.984
	b. Female	7	5	1			NS
3	**Educational status**						
	a. No formal education	1	0	0	5.794	8	0.670
	b. Primary education	9	6	0			NS
	c. Secondary education	7	9	2			
	d. Higher secondary	1	2	0			
	e. Graduate and above	13	7	3			
4	**Diet**						
	a. Vegs	4	6	1	1.332	2	0.514
	b. Non vegs	27	18	4			NS
5	**Marital status**						
	a. Married	27	21	2	9.600	4	0.107
	b. Unmarried	1	0	0			NS
	c. Widower	3	3	3			
	d. Divorced/separated	--	--	--			
6	**Occupation**						
	a. Professional	6	2	2	8.818	10	0.549
	b. Semi-professional	3	1	1			NS
	c. Clerical/shop/farmer	5	4	0			
	d. Skilled worker	11	13	2			
	e. Semi-skilled worker	4	4	0			
	f. Unskilled worker	--	--	--			
	g. Unemployed	2	0	0			
7	**Family Monthly income**						
	a. ≥ 20,482	18	12	4	3.122	6	0.793
	b. 10,241-20481	10	11	1			NS
	c. 7681-10240	2	1	0			
	d. 5120-7680	1	0	0			
	e. 3072-5119	--	--	--			
	f. 1034-3071	--	--	--			
	g. ≤ 1033	--	--	--			
8	**Residence**						
	a. Urban	25	20	4	0.075	2	0.963
	b. Rural	6	4	1			NS
9	**Duration of hospital stay**						
	a. Less than 1 month	20	16	4	1.283	4	0.864
	b. 1-2 months	8	7	1			NS
	c. More than 2 months	3	1	0			
10	**Family history of CVA**						
	a. Yes	8	3	0	2.824	2	0.244
	b. No	23	21	5			NS

11	**History of Hypertension:**						
	a. Yes	24	19	4	0.033	2	0.984 NS
	b. No	7	5	1			
12	**History of smoking**						
	a. Yes	12	8	1	0.711	2	0.701 NS
	b. No	19	16	4			
13	**History of comorbidity:**						
	a. Diabetes	3	11	2	13.01	4	0.011*
	b. Cardiovascular	1	2	1			
	disease	--	--	--			
	c. Atherosclerosis	27	11	2			
	d. No history						
14	**Duration of Hypertension:**						
	a. No Hypertension	8	7	1	4.365	6	0.627 NS
	b. Less than 1 year	1	1	1			
	c. 1-2 years	4	1	0			
	d. More than 2 years	18	15	3			
15	**Previous history of stroke:**						
	a. Yes	8	4	4	8.512	2	0.014*
	b. No	23	20	1			
16	**Any other treatment taken previously:**				0.635	2	0.728 NS
	a. Yes	16	10	2			
	b. No	15	14	3			
17	**Types of paralysis:**						
	a. Monoplegia	3	6	4	13.80	4	0.007*
	b. Hemiplegia	20	15	1			
	c. Paraplegia	--	--	--			
	d. Quadriplegia	--	--	--			
	e. None	8	3	0			

***P<0.05 level of significance** **NS-Non significant**

Table 7: Depicts the association between dysphagia exercise on swallowing ability among patient with Cerebrovascular Accident with demographic variables which was tested using chi-square test. The chi squares value revealed age, history of comorbidity, previous history of stroke and type of paralysis were found significant association at $p<0.05$. Whereas, Gender, educational status, diet, marital status, occupation, family monthly income, residence, duration of hospital stay, family history of CVA, history of hypertension, history of smoking, duration of hypertension and any other treatment taken previously were found to be statistically non-significant at $p<0.05$ with dysphagia exercise on swallowing ability among patient with Cerebrovascular Accident. So, the hypothesis H_3 is accepted.

DISCUSSION:

- In the present study, during pre-test majority 34 (56.7%) had moderate dysphagia, 18 (30%) had severe dysphagia and 8 (13.3%) had mild dysphagia where as in post-test maximum 31 (51.7%) had mild dysphagia, 24 (40%) had moderate dysphagia and 5 (8.3%) had severe dysphagia among patient with Cerebrovascular Accident.
- Result showed that post-test mean score was 15.01±3.28 was higher than pre-test mean score was 11.21±3.98 with mean difference was 3.80. The effectiveness was tested using paired t test with obtained (t=13.15) at df=59 was statistically significant at $p<0.01$ level. Findings revealed that dysphagia exercises had improved swallowing ability among patient with Cerebrovascular Accident.
- In the present study, the association between dysphagia exercise on swallowing ability among patient with Cerebrovascular Accident with demographic variables which was tested using chi-square test which revealed age, history of comorbidity, previous history of stroke and type of paralysis were found significant association at $p<0.05$ with swallowing ability of patient whereas gender, educational status, diet, marital status, occupation, family monthly income, residence, duration of hospital stay, family history of CVA, history of hypertension, history of smoking, duration of hypertension and any treatment taken previously were found to be statistically non-significant at $p<0.05$ with dysphagia exercise on swallowing ability among patient with Cerebrovascular Accident.

CONCLUSION:

The main conclusion obtained from the present study was that most of the patients who were diagnosed with Cerebrovascular Accident had difficulty in swallowing and after receiving dysphagia exercise there was a significant improvement in swallowing ability. It concluded that dysphagia exercise is effective on CVA patient who had difficulty in swallowing.

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