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A study to evaluate effectiveness of Chin Tuck Against Resistance (CTAR) exercise on swallowing ability and oral intake of food among Cerebrovascular Accident patients with dysphagia in selected Hospitals, Puducherry

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Abstract: *Stroke is a life changing event. Dysphagia can be seen in 65% of the patients with stroke. In order to improve the overall outcome after stroke it is essential that the swallowing ability and oral intake of food to be improved through Chin Tuck Against Resistance (CTAR) Exercise. The main objectives of the study were to evaluate the effectiveness of Chin Tuck Against Resistance (CTAR) exercise on swallowing ability and oral intake of food among CVA patients with dysphagia. The study was conducted in IGGGH&PGI, Puducherry. And the research method adopted was pre-experimental one group pre-test and post-test. As per the inclusion criteria, 20 samples were selected by purposive sampling technique. Pre-test data was collected by MASA (Mann assessment of swallowing ability scale) & FOIS (Functional Oral Intake scale). On that day onwards The Chin Tuck Against Resistance Exercise was administered for 8 consecutive days, 3 times a day before food. Post-test assessment of swallowing ability and oral intake of food among CVA patients with dysphagia was assessed using FOIS (Functional Oral Intake scale) the exercise for 8 consecutive days, 3 times a day before food. The study finding revealed that in the pre-test assessment of swallowing ability among CVA patients with dysphagia was149.25±10.48 and the post-test mean score was 159.0±15.31. The mean difference score was 9.75 (4.9%). The calculated student 't' test of t = 3.425 was found to be statistically significant at p<0.01 level. And that the Pretest mean score of food intake among CVA patients was 3.80±0.62 and the post-test mean score was 5.05±0.89. The mean difference score was 1.25 (17.9%). The calculated student 't' test of t = 6.492 was found to be statistically significant at p<0.001 level. The clearly infers that the Chin Tuck Against Resistance (CTAR) exercise administered among CVA patients with dysphagia was found to be effective in improving the swallowing ability and oral intake of food among CVA patients with dysphagia. The study was conducted among CVA patients with dysphagia. To evaluate the effectiveness of Chin Tuck Against Resistance Exercise. From the statistical inferences it is evident that administering Chin Tuck Against Resistance Exercise effective to improving swallowing ability and oral intake of food among CVA patients with dysphagia.*

Key Words: *Chin Tuck Against Resistance Exercise, CVA patients, Dysphagia.*

"Start thinking wellness, not illness"

\- Kate Allatt

1. INTRODUCTION:

The organ inside the head that regulates every bodily process in a person. The brain, which contains billions of nerve cells, is shielded by the skull (the bones that form the head). The brain stem, the cerebellum, and the cerebrum are its three main structural components. The cerebrum, which makes up the majority of the brain, is responsible for thinking, problem-solving, memory, emotions, speech, reading, and writing in addition to voluntary movement[1]. Different types of brain disorders exist. Among the main types of brain ailments include infections, trauma, seizures, tumors and stroke. One such illness is stroke. Stroke is also referred to as a cerebrovascular accident (CVA)[2]. Stroke is an area of brain tissue suddenly loses blood flow and oxygen, and as a result, starts to degenerate. It's possible that the limb or leg controlled by the affected brain area won't work properly anymore. Vision, speech, and sensory issues may result from a stroke. Ischemic stroke A stroke is brought on by a blood clot that forms suddenly in one artery or elsewhere in another artery Hemorrhagic Stroke When bleeding occurs in the brain, it congests the area and puts pressure on the brain's tissue, which disrupts normal blood flow and results in a stroke[3]. A stroke occurs when a blood vessel carrying

oxygen and nutrients to the brain becomes blocked or bursts (or ruptures). When this happens, a portion of the brain is deprived of blood (and oxygen), and it and brain cells perish[4].

Stroke has a high mortality rate. Survivors may experience vision and/or speech loss, paralysis, and confusion. Stroke is named after the way it knocks people out. People who have had a previous stroke are at a much higher risk of having another one. The type of stroke influences the risk of death[5]. Worldwide, around 2 million individuals in the age group of 18--50 years, experience stroke, and these numbers continue to rise. Stroke occurring in younger individuals presents specific implications. Apart from experiencing diverse predisposing factors for stroke, younger persons are within a socially and economically productive period. Hence, stroke in this age group tends to carry manifold social, physical, emotional, vocational, and economic connotations[6]. The burden of stroke is increasing in India; stroke is now the fourth leading cause of death and the fifth leading cause of disability. Previous research suggests that the incidence of stroke in India ranges between 105 and 152/100,000 people per year. Stroke, a cerebrovascular accident, is prevalent across patient populations and can be a significant cause of morbidity and mortality[7]. Dysphagia is a swallowing disorder involving the oral cavity, pharynx, esophagus, or gastroesophageal junction. Consequences of dysphagia include malnutrition and dehydration, aspiration pneumonia, compromised general health, chronic lung disease, choking, and even death. Adults with dysphagia may also experience disinterest, reduced enjoyment, embarrassment, and/or isolation related to eating or drinking. Dysphagia may increase caregiver costs and burden and may require significant lifestyle alterations for the patient and the patient's family[8]. Chin tuck against resistance (CTAR) exercise has recently been reported to be a new therapeutic exercise method that can help patients with dysphagia improve their swallowing function. However, due to differences in exercise protocols, methods, and tools used across CTAR exercise studies, an overall systematic review of these studies is required[9].

2. NEED FOR THE STUDY:

In India, the four cities of Mumbai, Trivandrum, Ludhiana, Kolkata, the state of Punjab, and 12 villages of Baruipur in the state of West Bengal. The total population denominator was 22,479,509 and 11,654 (mean 1294 SD 1710) people were identified with incident stroke. Crude incidence of stroke ranged from 108 to 172/100,000 people per year, crude prevalence from 26 to 757/100,000 people per year, and one-month case fatality rates from 18% to 42%[10].

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[11]. The prevalence of stroke per 1,000 populations was found to be 7.91 among in Puducherry, 5.81 among rural area, 1.72 among urban area, 4.93 among north Indians settled in the town area and 4.52 among Caucasians in Auroville[12]. Stroke and poor oral health are common in older people, and the brain injuries associated with stroke are often accompanied by a decline in oral function. In this study, the researcher investigated the characteristics of stroke patients who could not recover oral ingestion until discharge and the association between improved oral health, swallowing function and nutritional intake methods in acute care. Dysphagia is one of the most common and serious stroke complications. It is an independent predictor of poor outcome after an acute stroke, and it has been effective for many years[13].

Food or fluid texture modification as found to be one of the main compensatory interventions for dysphagia Recently, chin tuck against resistance exercise was reported as a novel method for improving swallowing function in patients with post-stroke dysphagia. However, because this exercise required physically weak patients to hold and fix the device with their hands, it may be difficult for them to complete[14]. The researcher found that Chin Tuck Against Resistance (CTAR) exercise is quite successful in improving swallowing ability and level of intake based on above mentioned review and researcher own observation. There are few research proving the effectiveness of Chin Tuck Against Resistance (CTAR) exercise. The purpose of this investigation was to evaluate the Effectiveness of Chin Tuck Against Resistance (CTAR) exercise in improving swallowing ability and level of intake of food among Cerebrovascular Accident patients with dysphagia[15]

3. Statement of the problem

A study to evaluate effectiveness of Chin Tuck Against Resistance (CTAR) exercise on swallowing ability and oral intake of food among Cerebrovascular Accident patients with dysphagia in selected Hospitals, Puducherry.

4. Objectives of the study

- To assess the existing level of dysphagia, swallowing ability and oral intake of foodamong CVA patients
- To evaluate the effectiveness of Chin Tuck Against Resistance (CTAR) exercise onswallowing ability and oral intake of food among CVA patients with dysphagia

- To associate the posttest level of swallowing ability and level of oral intake of foodamong CVA patients with dysphagia, with selected demographical & clinical variables.

4.1 hypotheses:

H1: There will be a significant difference in the pre and posttest swallowing ability after ChinTuck Against Resistance (CTAR) exercise.

H3: There will be a significant association between posttest level of swallowing ability and level of oral intake of food among CVA patients with selected demographical & clinical variables.

5. REVIEW OF LITERATURE:

SECTION A: LITERATURE RELATED TO INCIDENCE STROKEDYSPHAGIA

Klayne Cunha Matos, Vanessa Fernandes De Oliveira, Paula Luanna CarvalhoDe Oliveira and Pedro Braga Neto (2022) conducted a review study on an overview of dysphagia rehabilitation for stroke patients in Brazil. The sample consists of 36 articles of clinical trials were selected. Random method was used. The data were collected by MEDLINE-PubMed, LILACS, Cochrane, and Clinical trials.gov focusing on speech-language interventions for adult dysphagic patients after stroke. The results showed that there are presently few studies on the effectiveness of therapeutic approaches for the rehabilitation of adult stroke patients with dysphagia. The majority of techniques are used in conjunction with traditional therapy, making it impossible to evaluate their efficacy on their own. The study concluded that the patient's capabilities and limits should be taken into consideration while choosing a therapeutic intervention[16].

SECTION B: LITERATURE RELATED TO DYSPHAGIA AND ORAL INTAKE

Patrick Sanvanson and Reza Shaker (2021) The study reveals that on Disorders causing Oropharyngeal Dysphagia in USA. The study showed that disruption of one or more ofthe intricately timed swallowing processes, resulting in improper transport and/or airway protection. The symptoms of OPD were extremely specific and should not be discounted as psychological in nature, regardless of whether they are brought on by one of a number of muscular disorders, disorders of the peripheral and central nervous systems, oropharyngeal cavity cancers, or by surgical and radiation therapy for these cancers. The goal of a physical examination should be to find any neurologic deficiencies. The video-fluoroscopic recording of a modified barium swallow is the diagnostic modality of choice for the initial examination of the patient with OPD, despite the availability of a number of helpful diagnostic modalities. A well-trained multidisciplinary team must take a methodical approach to the diagnosis and best management of OPD[17].

SECTION C: LITERATURE RELATED TO CHIN TUCK AGAINST RESISTANCE (CTAR) EXERCISES FOR POST STROKE DYSPHAGIA

Ji-Su Park and Na-Kyoung Hwang (2021) had undertaken a systematic review on chin tuck against resistance exercise for dysphagia rehabilitation in Republic of Korea. The sample consisted of 9 articles. Data were collected by CTAR exercise using electronic databases. Random method were used. The results showed that according to four articles, CTAR exercise not only assisted in the activation of the suprahyoid muscle in healthy adults, but also inhibited the activation of the sternocleidomastoid muscle compared to Shaker exercise. Additionally, according to five articles, CTAR exercise was successful in enhancing oral food stage in the pharyngeal phase and improving swallowing function in individuals with dysphagia following stroke, including a decrease in airway aspiration. The study concluded thatCTAR exercise is a useful therapeutic exercise for enhancing swallowing function in people with dysphagia because it more selectively engages the suprahyoid muscle. It involved less physical strain and effort than Shaker exercise, which facilitates better compliance[18].

6. MATERIALS AND METHODS:

The research approach and design selected for this study was quantitative approach and pre-experimental one group pre-testand post-test research design respectively. The study setting was all Neuro units such as Neuro ward, Neuro OPD, stroke ICU, Neuro ICU in selected hospital at Puducherry. As per the inclusion criteria, 20 samples were selected by purposive sampling technique. Pre-test data was collected by MASA (Mann assessment of swallowing ability scale) & FOIS (Functional Oral Intake scale). On that day onwards The Chin Tuck Against Resistance Exercise was administered for 8 consecutive days, 3 times a day before food. Post-test assessment of swallowing ability and oral intake of food among CVA patients with dysphagia was assessed using FOIS (Functional Oral Intake scale) the exercise for 8 consecutive days, 3 times a day before food.

7. DATA ANALYSIS:

Table 1: Frequency and percentage distribution of demographic variables of cerebrovascular accident patients with dysphagia.

n = 20

Demographic Variables	No.	%
Age		
36 – 45	-	-
46 – 55	3	15.0
55 – 65	7	35.0
>65	10	50.0
Gender		
Male	9	45.0
Female	11	55.0
Others	-	-
Marital status		
Unmarried	4	20.0
Married	5	25.0
Divorced	-	-
Widowed	11	55.0
Separated / Single	-	-
Education		
Primary	14	70.0
Secondary	4	20.0
Higher secondary	2	10.0
Graduate and above	-	
Illiterate	-	
Religion		
Hindu	12	60.0
Christian	5	25.0
Muslim	3	15.0
Others	-	-
Area		
Urban	7	35.0
Rural	10	50.0
Semi urban	3	15.0
Duration. of symptoms of dysphagia		
1 – 2 days	-	-
3 – 4 days	2	10.0
5 – 8 days	6	30.0
>8 days	12	60.0
No. of family members		
1 – 2	2	10.0
3 – 4	9	45.0
5 – 6	8	40.0
>6	1	5.0
Relationship of the caretaker		
Daughter	5	25.0
Son	8	40.0
Wife	2	10.0
Sister	4	20.0
Grandson	1	5.0
Diagnosis		
CVA – LT – Hem	9	45.0
CVA – RT – Hem	11	55.0
Type of stroke		
Ischemic	11	55.0
Hemorrhagic	9	45.0

Demographic Variables	No.	%
CT findings		
HEM	7	35.0
Ischemic	13	65.0
Treatment		
Cerebral hemorrhage	7	35.0
Corpel Swelling	4	20.0
Cyto Ede	6	30.0
Hypodens	3	15.0
Hypertension		
Yes	20	100.0
No	0	0
If yes, How long years		
1 – 5	3	15.0
6 – 10	10	50.0
11 – 15	6	30.0
>15 years	1	5.0
Treatment		
T.Amlong	12	60.0
T.Nifidipine	4	20.0
T.Ramipril	4	20.0
Diabetes		
Yes	8	40.0
No	12	60.0
Treatment		
T.Medformin	8	40.0
Nil	12	60.0
Cardiovascular disease		
Yes	-	-
No	20	100.0
Renal disease		
Yes	2	10.0
No	18	90.0
Treatment		
Dialysis	2	10.0
Nil	18	90.0
Personal history		
Smoking	10	50.0
Drinking	-	-
Drug abuse	-	-
Others	-	-
Nil	10	50.0

The table 1 shows that most of the CVA patients, 10(50%) was aged >65 years, 11955%) were female and were widowed, 14(70%) had primary education, 12(60%) wereHindus, 10(50%) were residing in rural area, 12(60%) had duration of symptoms of dysphagia for >8 days, 9(45%) 3 – 4 family members, 8(40%) had sons as caretakers, 11(55%) were diagnosed with CVA – RT – Hem and ischemic type of stroke, 13(65%) had CT findings of ischemic, 7(35%) were treated for Cerebral hem, 20(100%) had hypertension, 10(50%) hypertension for 6 – 10 years, 12(60%) were treated for T.Amlong,had diabetes and were not treated, 20(100%) had no cardiovascular disease, 18(90%) hadno renal disease and were not under treatment for renal disease and 10(50%) had personalhistory of smoking and had no personal history respectively.

Table 2: Assessment of clinical variables of cerebro vascular accident patients withdysphagia.

n = 20

Variables	Minimum	Maximum	Median	Mean	S.D
Temperature	36.20	37.80	37.20	37.22	0.43
Pulse	76.0	86.0	80.0	80.05	2.84
Respiration	16.0	24.0	18.0	19.0	2.38
Systolic BP	110.0	140.0	130.0	127.50	11.18
Diastolic BP	70.0	90.0	80.0	81.0	7.18

The above table shows that with regard to temperature the mean score was 37.22±0.43. The median score was 37.20 with minimum score of 36.20 and maximumscore of 37.80.

With respect to pulse rate the mean score was 80.05±2.84. The median score was 80.0 with minimum score of 76.0 and maximum score of 86.0.

Regarding the respiration the mean score was 19.0±2.38. The median score was with minimum score of 16.0 and maximum score of 24.0.

Considering the systolic BP the mean score was 127.50±11.18. The median scorewas 130.0 with minimum score of 110.0 and maximum score of 140.0.

The mean score of diastolic BP was 81.0±7.18. The median score was 80.0 withminimum score of 70.0 and maximum score of 90.0.

Table 3: Frequency and percentage distribution of pretest level of dysphagia among CVA patients with dysphagia.

n = 20

Level of Dysphagia	Pretest	
	No.	%
No abnormality detected (178 – 200)	-	-
Mild (168 – 177)	-	-
Moderate (139 – 167)	18	90.0
Severe (≤138)	2	10.0

The table 3 shows that in the pretest, 18(90%) had moderate dysphagia and 2(10%) had severe dysphagia with no intake by mouth in the post test after the administration of Chin Tuck Against Resistance (CTAR) exercise among CVA patients12(60%) had moderate dysphagia, 4(20%) had mild dysphagia and 4(20%) had no abnormality detected.

Table 4: Frequency and percentage distribution of pretest level of oral intake andswallowing ability among CVA patients with dysphagia.

n = 20

Level of Oral Intake	Pretest	
	NO	%
Level 1	-	-
Level 2	-	-
Level 3	6	30.0
Level 4	12	60.0
Level 5	2	10.0
Level 6	-	
Level 7	-	-

The table 4 shows that in the pretest, 12(60%) had level 4 functional oral intake,6(20%) had level 3 functional oral intake and 2(10%) had level 5 oral intake and in the post test after the administration of Chin Tuck Against Resistance (CTAR) exercise among CVA patients 8(40%) had level 6 oral intake, 7(35%) had level 7 oral intake, 4(20%) had level 5 oral intake and only 1(5%) had level 4 oral intake.

Table 5: Effectiveness of Chin Tuck Against Resistance (CTAR) exercise on swallowing ability among CVA patients with dysphagia.

n = 20

Swallowing ability	Mean	S.D	Mean Difference & %	Student 't' test Value
Pretest	149.25	10.48	9.75	**t=3.425**
Post Test	159.0	15.31	(4.9%)	**p=0.003, S****

**p<0.01, S – Significant

The table 5 shows that the pretest mean score of dysphagia among CVA patients was 149.25±10.48 and the post test mean score was 159.0±15.31. The mean difference score was 9.75 (4.9%). The calculated Student 't' test of t = 3.425 was found to be statistically significant at p<0.01 level. The clearly infers that the Chin Tuck Against Resistance (CTAR) exercise administered among CVA patients was found to be effective on swallowing ability among CVA patients with dysphagia.

Table 6: Effectiveness of Chin Tuck Against Resistance (CTAR) exercise on oral intake of food among CVA patients with dysphagia.

n = 20

Oral intake of food	Mean	S.D	Mean Difference & %	Student 't' testValue
Pretest	3.80	0.62	1.25 (17.9%)	**t=6.571 p=0.0001, S*****
Post Test	5.05	0.89		

***p<0.001, S – Significant

The table 6 shows that the pretest mean score of food intake among CVA patientswas 3.80±0.62 and the post test mean score was 5.05±0.89. The mean difference score was 1.25 (17.9%). The calculated student 't' test of t = 6.492 was found to be statistically significant at p<0.001 level. The clearly infers that the Chin Tuck Against Resistance (CTAR) exercise administered among CVA patients was found to be effective on oral intake of food among CVA patients with dysphagia.

Table 7: Association of posttest level of Swallowing ability and oral intake of food among CVA patients with dysphagia, with their selected demographic and clinical variables.

n = 20

Demographic Variables	Level 4		Level 5		Level 6		Level 7		Chi-Square value & p-value
	No.	%	No.	%	No.	%	No.	%	
Age									**χ^2=13.084 d.f=6 p = 0.042 S***
36 – 45	-	-	-	-	-	-	-	-	
46 – 55	1	5.0	0	0	2	10.0	0	0	
55 – 65	0	0	3	15.0	2	10.0	1	5.0	
>65	0	0	1	5.0	4	20.0	6	30.0	
Gender									χ^2=3.622 d.f=3 p = 0.305N.S
Male	1	5.0	3	15.0	3	15.0	2	10.0	
Female	0	0	1	5.0	5	25.0	5	25.0	
Others	-	-	-	-	-	-	-	-	

Demographic Variables	Level 4		Level 5		Level 6		Level 7		Chi-Square value & p-value
	No.	%	No.	%	No.	%	No.	%	
Marital status									χ^2=14.696 d.f=6 p = 0.023 S*
Unmarried	0	0	1	5.0	0	0	4	20.0	
Married	1	5.0	2	10.0	1	5.0	0	0	
Divorced	-	-	-	-	-	-	-	-	
Widowed	0	0	1	5.0	7	35.0	3	15.0	
Separated / Single	-	-	-	-	-	-	-	-	
Education									χ^2=3.941 d.f=6 p = 0.685N.S
Primary	1	5.0	3	15.0	5	25.0	5	25.0	
Secondary	0	0	1	5.0	1	5.0	2	10.0	
Higher secondary	0	0	0	0	2	10.0	0	0	
Graduate and Above	-	-	-	-	-	-	-	-	
Illiterate	-	-	-	-	-	-	-	-	
Religion									χ^2=14.107 d.f=6 p = 0.028 S*
Hindu	1	5.0	1	5.0	5	25.0	6	30.0	
Christian	0	0	3	15.0	0	0	1	5.0	
Muslim	0	0	0	0	3	15.0	0	0	
Others	-	-	-	-	-	-	-	-	
Area									χ^2=2.228 d.f=6 p = 0.898N.S
Urban	0	0	2	10.0	3	15.0	2	10.0	
Rural	1	5.0	1	0	4	20.0	4	20.0	
Semi urban	0	0	1	0	1	5.0	1	5.0	
Dur. of Symptoms									χ^2=14.879 d.f=6 p = 0.021 S*
1 – 2 days	-	-	-	-	-	-	-	-	
3 – 4 days	1	5.0	0	0	0	0	1	5.0	
5 – 8 days	0	0	1	5.0	4	20.0	0	0	
>8 days	0	0	3	15.0	4	20.0	6	30.0	
NOFM									χ^2=6.954 d.f=9 p = 0.642N.S
1 – 2	0	0	1	5.0	0	0	1	5.0	
3 – 4	0	0	2	10.0	5	25.0	2	10.0	
5 – 6	1	5.0	1	5.0	2	10.0	4	20.0	
>6	0	0	0	0	1	5.0	0	0	
Rtship of the Caretaker									χ^2=14.054 d.f=12 p = 0.297 N.S
Daughter	0	0	1	5.0	1	5.0	3	15.0	
Son	1	5.0	2	10.0	4	20.0	1	5.0	
Wife	0	0	0	0	0	0	2	10.0	
Sister	0	0	0	0	3	15.0	1	5.0	
Grandson	0	0	1	5.0	0	0	0	0	

Demographic Variables	Level 4		Level 5		Level 6		Level 7		Chi-Square value & p-value
	No.	%	No.	%	No.	%	No.	%	
Diagnosis									χ^2=1.457 d.f=3 p = 0.692N.S
CVA – LT – Hem	0	0	2	10.0	3	15.0	4	20.0	
CVA – RT – Hem	1	5.0	2	10.0	5	25.0	3	15.0	
Type of stroke									χ^2=1.457 d.f=3 p = 0.692N.S
Ischemic	1	5.0	2	10.0	5	25.0	3	15.0	
Hemorrhagic	0	0	2	10.0	3	15.0	4	20.0	
CT findings									χ^2=4.144 d.f=3 p = 0.246N.S
HEM	1	5.0	1	5.0	4	20.0	1	5.0	
Ischemic	0	0	3	15.0	4	20.0	6	30.0	
Treatment									χ^2=4.664 d.f=9 p = 0.863N.S
Cerebral hem	1	5.0	1	5.0	4	20.0	1	5.0	
Corpus Swelling	0	0	1	5.0	1	5.0	2	10.0	
Cyto Ede	0	0	1	5.0	2	10.0	3	15.0	
Hypodens	0	0	1	5.0	1	5.0	1	5.0	
Hypertension									-
Yes	1	5.0	4	20.0	8	40.0	7	35.0	
No	-	-	-	-	-	-	-	-	
If yes, How long Years									χ^2=6.167 d.f=9 p = 0.723N.S
1 – 5	0	0	1	5.0	2	10.0	0	0	
6 – 10	0	0	2	10.0	4	20.0	4	20.0	
11 – 15	1	5.0	1	5.0	2	10.0	2	10.0	
>15 years	0	0	0	0	0	0	1	5.0	
Treatment									χ^2=10.536 d.f=6 p = 0.104N.S
T.Amlong	0	0	2	10.0	4	20.0	6	30.0	
T.Nifidipine	1	5.0	0	0	3	15.0	0	0	
T.Ramipril	0	0	2	10.0	1	5.0	1	5.0	
Diabetes									χ^2=5.045 d.f=3 p = 0.169N.S
Yes	1	5.0	0	0	3	15.0	4	20.0	
No	0	0	4	20.0	5	25.0	3	15.0	
Treatment									χ^2=5.045 d.f=3 p = 0.169N.S
T.Metformin	1	5.0	0	0	3	15.0	4	20.0	
Nil	0	0	4	20.0	5	25.0	3	15.0	
Cardiovascular Disease									-

Demographic Variables	Level 4		Level 5		Level 6		Level 7		Chi-Square value & p-value
	No.	%	No.	%	No.	%	No.	%	
Yes	-	-	-	-	-	-	-	-	
No	1	5.0	4	20.0	8	40.0	7	35.0	
Renal disease									χ^2=10.476 d.f=3 p = 0.015 S*
Yes	1	5.0	0	0	0	0	1	5.0	
No	0	0	4	20.0	8	40.0	6	30.0	
Treatment									χ^2=10.476 d.f=3 p = 0.015 S*
Dialysis	1	5.0	0	0	0	0	1	5.0	
Nil	0	0	4	20.0	8	40.0	6	30.0	
Personal history									χ^2=3.286 d.f=3 p = 0.350N.S
Smoking	1	5.0	3	15.0	4	20.0	2	10.0	
Drinking	-	-	-	-	-	-	-	-	
Drug abuse	-	-	-	-	-	-	-	-	
Others	-	-	-	-	-	-	-	-	
Nil	0	0	1	5.0	4	20.0	5	25.0	

*p<0.05, S – Significant, N.S – Not Significant

The table 7 shows that the demographic variables age (χ^2=13.084, p=0.042), marital status (χ^2=14.696, p=0.023), Religion (χ^2=14.107, p=0.028), duration of symptoms (χ^2=14.879, p=0.021), renal disease (χ^2=10.476, p=0.015) and treatment(χ^2=10.476, p=0.015) had showed statistically significant association with post test level of oral food intake among CVA patients at p<0.05 level. The other demographic variablesdid not show statistically significant association with post test level of swallowing ability and oral intake of food among CVA patients with dysphagia.

Table 8: Association on swallowing ability and oral intake of food among CVA patients with their selected clinical Variables.

n = 20

Clinical Variables	Level 3		Level 4		Level 5		Level 6		Chi-Square value & p-value
	No.	%	No.	%	No.	%	No.	%	
Temperature									χ^2=28.804 d.f=15 p = 0.017 S*
36.20	0	0	0	0	0	0	2	10.0	
37.00	0	0	1	5.0	1	5.0	2	10.0	
37.20	0	0	0	0	3	15.0	2	10.0	
37.40	0	0	2	10.0	2	10.0	1	5.0	
37.60	1	5.0	0	0	0	0	0	0	
37.80	0	0	1	5.0	2	10.0	0	0	
Pulse									χ^2=33.204 d.f=18 p = 0.016 S*
76.0	1	5.0	0	0	0	0	0	0	
77.0	0	0	0	0	1	5.0	0	0	
78.0	0	0	1	5.0	1	5.0	5	10.0	
80.0	0	0	2	10.0	2	10.0	1	5.0	
82.0	0	0	1	5.0	2	10.0	0	0	

Clinical Variables	Level 3		Level 4		Level 5		Level 6		Chi-Square value & p-value
	No.	%	No.	%	No.	%	No.	%	
84.0	0	0	0	0	0	0	1	5.0	
86.0	0	0	0	0	2	10.0	0	0	
Respiration									
16.0	0	0	2	10.0	1	5.0	1	5.0	χ^2=10.608 d.f=12 p = 0.563 N.S
18.0	0	0	1	5.0	3	15.0	3	15.0	
20.0	1	5.0	0	0	3	15.0	2	10.0	
22.0	0	0	1	5.0	0	0	0	0	
24.0	0	0	0	0	1	5.0	1	5.0	
Systolic BP									
110.0	0	0	1	5.0	1	5.0	2	10.0	χ^2=11.798 d.f=9 p = 0.225 N.S
120.0	0	0	0	0	3	15.0	0	0	
130.0	1	5.0	0	0	3	15.0	3	15.0	
140.0	0	0	3	15.0	1	5.0	2	10.0	
Diastolic BP									
70.0	0	0	1	5.0	1	5.0	2	10.0	χ^2=5.792 d.f=6 p = 0.447 N.S
80.0	0	0	1	5.0	6	30.0	3	15.0	
90.0	1	5.0	2	10.0	1	5.0	2	10.0	

*p<0.05, S – Significant, N.S – Not Significant

The above table 8 shows that the clinical variables temperature **(χ^2=28.804, p=0.017)**, and pulse **(χ^2=33.204, p=0.016)** had showed statistically significant association with post test level of oral food intake among CVA patients at p<0.05 level. The other clinical variables did not show statistically significant association with post test level of swallowing ability and oral intake of food among CVA patients with dysphagia.

8. RECOMMENDATIONS:

- For better generalization of the study findings the study can be conducted with largersample size.
- The study can be correlate between the Chin Tuck Against Resistance (CTAR)exercise and other alternative methods.
- The study can be replicated at various settings in rural and urban areas.
- The study can be done any other patient with dysphagia.
- Similar study can be used for children with speech disorder.
- The study can be used different level of dysphagia
- Comparative study can be done in young and adult patients with dysphagia.

9. CONCLUSION:

The study result proved that the effectiveness of Chin Tuck Against Resistance (CTAR) exercise to improving swallowing ability and oral intake of food among Cerebrovascular Accidentpatients with dysphagia in selected Hospitals, Puducherry. So, this method of Chin Tuck Against Resistance (CTAR) exercise to improve swallowing ability and oral intake of food can be exercisedand promoted by CVA Patient with dysphagia in their swallowing ability and oral intake of food.

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