

“Effectiveness Of Pharyngeal Electrical Stimulation Along With Shaker Exercise On Swallowing Function And Quality Of Life In Patient With Post Stroke Dysphagia”

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ABSTRACT

Background of the study: Stroke is the main cause of adult disability and the third most common cause of death in Europe. Acute stroke is complicated by or pharyngeal dysphagia in up to 50% of patients and although it often resolves over the following weeks, 40% of these patients can increase remain dysphagic a year later.

Aim: The aim of this study to find out the effectiveness of pharyngeal electrical stimulation along with shaker exercise on swallowing function and quality of life in patients with post stroke dysphagia.

Method: A total number of 20 subjects with dysphagia were screened for the study inclusion criteria and 12 subjects were selected for the study. 100ml water swallowing test was used to evaluate the subject's severity of swallowing and the associated disability among the samples.

Results: Comparison of the mean value of pre and post of pharyngeal stimulation along with shaker exercise. Eating assessment tool. Pre Test value is 3. Post Test value is 1.100 ML Water swallowing Test. Pre Test value is 85. Post Test value is 35.

Conclusion: This study concludes that pharyngeal electrical stimulation along with shaker exercise more effective on swallowing function and quality of life in patients with post stroke dysphagia

KEYWORDS ; Dysphagia., Pharyngeal Stimulation ., Stroke., Swallowing Dysfunction., Swallowing Test., Shaker Exercise.

I. INTRODUCTION

Stroke is the main cause of adult disability and the third most common cause of death in Europe. Acute stroke is complicated by or pharyngeal dysphagia in up to 50% of patients and although it often resolves over the following weeks, 40% of these patients can increase remain dysphagic a year later.

Dysphagia leads to aspiration and a 3-fold in pneumonia and malnutrition. Any neurologic or

muscular damage along the deglutitive axes can cause dysphagia. Thus, central causes of dysphagia in stroke patients include damage to the cortex or brain stem, and peripheral causes include damage to the nerves or muscles involved in swallowing. Although dysphagia may be treated by a number of techniques, there are no definitive patients who remain chronically dysphagic require enteral feeding through a naso-gastric tube (NG) or percutaneous endoscopically introduced, gastrostomy tube (PEG) and are more likely to require long-term institutional interventions

Human swallowing has bilateral representation in the cerebral cortex but commonly with a dominant hemisphere (which is unrelated to handedness) Dysphagia has been shown to often follow a stroke that affects the dominant cortex, or after a recurrent stroke. Importantly, swallowing is highly dependent on afferent feedback from bulbar cranial nerves innervating the upper aerodigestive tract and a number of reports have demonstrated that increased sensory input can drive long-term beneficial changes in the cortical control of swallowing and this is associated with functionally relevant reorganisation of the swallowing cortex.

In normal volunteers and patients with subacute stroke and dysphagia, pharyngeal electrical stimulation (PES) at 5 Hz and 75% of maximum tolerated intensity (typically ~10–20 mA) for 10 minutes produced the strongest effect on brain excitability measured with transcranial magnetic stimulation (TMS). Similar stimulation was able to completely reverse a virtual lesion induced in the pharyngeal motor cortex (by slow frequency repetitive TMS) in healthy subjects. A similar treatment paradigm was also most effective in dysphagic patients after stroke in a dose comparison study.

Shaker exercise is a therapeutic technique for the training of the front neck muscles which are related to swallowing. This exercise includes isotonic and isometric movements. The shaker

exercise is a treatment originally developed to improve swallowing difficulties due to restricted UES opening. The exercise aims to strengthen the suprahyoid muscles in neck, which during swallowing enhance the upward and forward movement of the hyoid bone and larynx, resulting improve opening of the UES.

The Masako maneuver improves the function of pharynx musculature by strengthening the base of the tongue muscles. It has been reported to improve swallowing by improving the coordination of the larynx, hyoid bone, and pharynx. This also reduces airway obstruction during pharyngeal swallowing. There are literatures which prove the effects of Shaker exercise and Masako maneuver on the other conditions like head and neck cancer, aspiration pneumonia, tracheostomy, ventilator dependency without neurologic/ structural disturbances. However, there is limited literature showing the effect of the Masako maneuver in post-stroke dysphagia.

AIM & OBJECTIVES

AIM:

- The aim of this study to find out the effectiveness of pharyngeal electrical stimulation along with shaker exercise on swallowing function and quality of life in patients with post stroke dysphagia.

OBJECTIVES:

- To access the effectiveness of pharyngeal electrical stimulation along with shaker exercise on swallowing function and quality of life in patients with post stroke dysphagia by using eating assessment tool.
- To access the effectiveness of pharyngeal electrical stimulation along with shaker exercise on swallowing function and quality of life in patients with post stroke dysphagia by using 100ml water swallowing test

DESIGN AND METHODOLOGY

MATERIALS:

- couch
- Pillow
- Towel
- Water
- Electric Stimulator
- Tray
- Cup
- Eating assessment scale-10

METHODOLOGY:

STUDY DESIGN:

The study was pre and post experimental.

SAMPLE TECHNIQUE:

Random sample technique

STUDY SETTING:

The study was conducted at outpatient department in Sir issac newton college of physiotherapy, Nagapattinam.

SAMPLING SIZE:

Total number of 12 Subjects are taken for study.

STUDY DURATION :

Study was conducted for a period of 12 weeks.

INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA:

- Patient diagnosed with stroke with less than 3 months of onset.
- Patient with Oropharyngeal dysphagia after stroke conformed by VFSS(videofluoroscopy).
- Age group between 20-70 years.
- Those with nasogastric tube. Liquid aspiration or penetration on VFSS((videofluoroscopy).
- Patient have sufficient, physical and mental ability to understand instruction and cooperate throughout the session, able to communicate properly, those without ant cognitive deficit

EXCLUSION CRITERIA

- Pharyngeal surgical procedures of the strap muscles -mylohyoid, geniohyoid, anterior gastric, thyrohyoid muscle.
- Patients who could not lift their head and flex the neck.
- Patients with previous history of stroke.
- Gastrostomy tube.
- Those who had undergone tracheostomy.
- Those with cervical herniated nucleus, cervical spine orthosis.
- Unstable medical conditions

STUDY PROCEDURE

A total number of 12 subjects who met inclusion and exclusion criteria were recruited. Prior to the treatment, pretest were conducted with eating assessment tool and 100ml water swallowing test. After a brief demonstration about pharyngeal electrical stimulation and shaker exercise with 12 subjects were treated with the same period of 12 weeks. The post test were conducted for subjects by eating assessment tool and 100 ml water swallowing test. Pre and post results were recorded and analysed.

TREATMENT PROCEDURE

PHARYNGEAL ELECTRICAL STIMULATION:

Treatment was started once dysphagia was confirmed by VFS and given daily for 3 days. At each session, the catheter was connected to the controlling base station, and electric current at 5 Hz was increased incrementally from 1 mA to detect threshold (patient first aware of stimulation) and then tolerated (patient does not want current increased further) intensity levels in all patients.

Those randomized to active PES were then administered this for 10 minutes at a treatment current (mA) of threshold plus 75% of the difference between threshold and tolerance levels; this paradigm was used successfully in earlier studies of PES and considered to be an effective level of stimulation without being too near the tolerance level.

PARAMETERS	
Types of current	Faradic current
Types of electrode	Pad electrode
Duration of stimulation	10 minutes
Modes	Pulse
Frequency	5Hz

SHAKER EXERCISE

Shaker exercise along in patient was perform isometric and isotonic movements. First, sustained three head lifts held for 60-seconds without movement in a supine position with a 60seconds of rest between lifts, then, patient performed 30 consecutive repetitions of head lift

without holding in the same supine position. For sustained repetitive head rising, patient was instructed to raise the head high enough to be able to observe their toes without raising their shoulders. Shaker exercise was performed for 3 times per day for 10 min, 5 days a week, for 4 weeks.

EXERCISE PROTOCOL	
Exercise name	Shaker exercise
Patients position	Supine
Repetitions	10×3

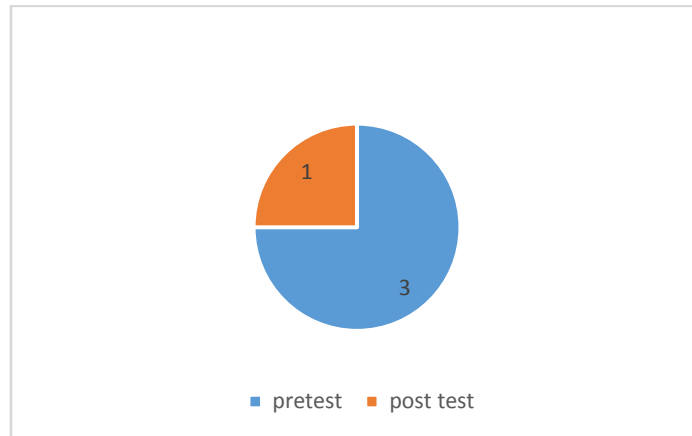
II. DATA ANALYSIS

A sample of 12 subjects were included for the study. Mean and mean difference calculated the

test was applied to the group pre and post treatment values.

TABLE 1: PRE AND POST TEST MEAN VALUE OF EATING ASSESSMENT TOOL

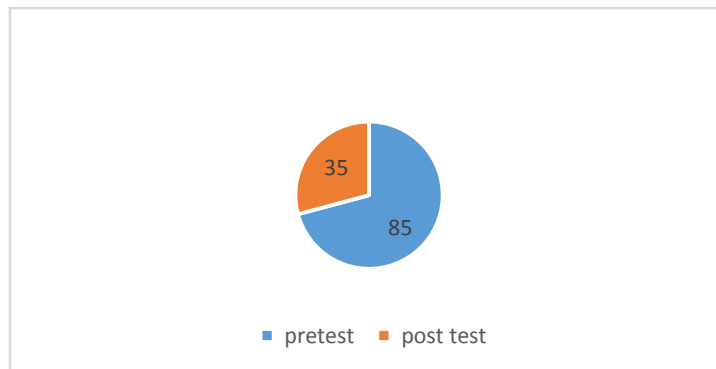
	N	MEAN	MEAN DIFFERENCE
PRE	12	3	
POST	12	1	2



GRAPH1:MEAN VALUE OF EATING ASSESSMENT TOOL

TABLE 2: PREANDPOSTTESTMEANVALUEOFEATINGASSESSMENT TOOL

	N	MEAN	MEAN DIFFERENCE
PRE	12	85	50
POST	12	35	



GRAPH 2: MEAN VALUE OF 100 ML WATER SWALLOWING

III. RESULT

Results shows that pharyngeal electrical stimulation along with shaker exercise was effective to improve swallowing function and quality of life. Pharyngeal stimulation along with shaker exercise shows significant different in pre and posttest value before and after application. Comparison of the mean value of pre and post of pharyngeal stimulation along with shaker exercise. Eating assessment tool. PreTest value is 3. Post Test value is 1. 100 ML Water swallowing Test. PreTest value is 85. Post Test value is 35.

Dysphagia is a common complication after stroke and is associated, independently, with a poor outcome. Although there are a number of interventions that show promise for treating dysphagia, none have definitive data . Three trials have now been reported assessing the safety and efficacy of dysphagia (defined as DSRS >3). Patients randomised to PES also had a trend to a reduced length of stay in hospital. When assessed in prespecified subgroups, PES appeared to be more effective in reducing radiological aspiration in patients with severe stroke, especially those with severe clinical dysphagia.

IV. DISCUSSION

An ongoing larger study (STEPS trial), which will be twice this size of this analysis, will extend information on PES for poststroke

dysphagia. Although other studies of PES have been performed.

The exercises improved swallowing function and quality of life in stroke patients with dysphagia. However, Shaker Exercise with conventional therapy showed more improvement in poststroke dysphagia. Shaker exercise is a therapeutic method for training the swallowing-related muscles in the front of the neck. It is a strap muscle exercise. This exercise is intended to improve the flexibility and strength of the strap muscle. This head lift exercise is primarily composed of isometric and isokinetic contraction movements. Because of these repetitive movements, the Shaker exercise is effective for activating muscles in front of the neck, improving the anterior and superior movement of the hyoid bone, and contributing to the opening of the upper esophageal sphincter and strengthening the muscles. It improves swallowing in patients with swallowing difficulty.

The shaker exercise directly targets the swallowing musculature, it may be more beneficial in improving swallowing function.

V. CONCLUSION

The study was concluded that pharyngeal electrical stimulation along with shaker exercise was significant improvement on swallowing function and quality of life performed In dysphagia patients.

Authors' Contribution

Gokulakrishnan janarthanan contributed to the study concept, design, analysis of the data, prepared the first draft of the paper and revised the manuscript.

Dr P. Lakshmikanth has helped in data acquisition.

Both authors read and approved the final manuscripts.

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