



## Effectiveness of Sensory Stimulation on Sensory Function Among Patients with Stroke

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### Article History:

Received on: 18 Sep 2020  
Revised on: Oct 2020  
Accepted on: 09 Nov 2020  
Keywords:

Sensory Stimulation,  
Sensory Function,  
Stroke

### ABSTRACT

Stroke or brain attack is the effect of lack of blood circulation to the brain. Deficient blood delivery to brain results in lack of oxygen and nutrients. Brain cells are very sensitive to hypoxia. They stop working within 3-5 minutes if they are not getting oxygen and nutrients. This cell death results in stroke. Stroke is a medical emergency. Immediate treatment can reduce injury to the brain and possible complications. About half of stroke patients experience the ill effects of the problem of awareness with such antagonistic impacts as tangible hardship. The arrangement of a consideration program comprising of straightforward and safe incitements can forestall tangible hardship and improve the patient's sensory capacity. Hence the study aimed to assess the effectiveness of sensory stimulation on the sensory function among patients with stroke. Pre experimental design-One group pre and post design was adopted for the study with 30 samples which matched the inclusion criteria were selected by non-probability convenience sampling technique. Demographic variables data were collected by using a multiple-choice questionnaire followed by assessing the sensory function by using the SMART scale. The findings of the study Out of 30 samples in the experimental group, 26 (86.7%) had moderate level of sensory dysfunction and 4 (13.3%) had mild level of sensory dysfunction. After giving the intervention of sensory stimulation post test shows 24 (80%) had mild level of sensory dysfunction and 6(20%) had normal sensory function. Sensory stimulation is effective and the patient with sensory function among stroke. This study indicates that sensory stimulation which containing certain stimulation was an effective, inexpensive, simple measure for improving sensory dysfunction among patients with stroke.

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ISSN: 0975-7538

DOI: <https://doi.org/10.26452/ijrps.v11iSPL4.3746>

Production and Hosted by

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### INTRODUCTION

The brain is a part of nervous system and a very important vital organ is protected in the skull as it is very delicate in nature (Dimyan and Cohen, 2011). Nerves cells, fibers, and neurons which are part of nervous system linked with brain cells and maintain body functions like sensations, movements, thoughts, etc (von Bornstädt et al., 2015). Damage and infection of any part of nervous system may lead to temporary or permanent disability, psychiatric disorders or even death. (Frostig et al., 2013).

Stroke or brain attack is the effect of lack of blood circulation to the brain (Iadecola, 2004). Deficient

blood delivery to brain results in lack of oxygen and nutrients. Brain cells are very sensitive to hypoxia (Chen-Bee *et al.*, 2007). They stop working within 3-5 minutes if they are not getting oxygen and nutrients. This cell death results in stroke (Baker *et al.*, 2013). Stroke is a medical emergency (Heiss, 1976). Immediate treatment can reduce injury to the brain and possible complications (Latchaw *et al.*, 2003). There may be stroke due to lack of blood supply from blockage of cerebral arteries or may be due to cerebral haemorrhage (Lassen, 1985).

A Stroke, formally known as a Cerebrovascular accident (CVA) is a medical emergency occur when blood flow to the brain stops or interrupted or severely reduced leads to deprivation of oxygen and nutrients to brain cells in which cells begin to die (Shiokawa *et al.*, 1986). Cerebrovascular accident is the third biggest killer in India after heart attack and cancer. Cerebrovascular accident is a major public health concern in both developed and developing countries. It is the main source of serious, long haul disability (Shen *et al.*, 2005).

Stroke is the third driving reason for death in the United States. In excess of 140,000 individuals bite the dust every year from cerebrovascular mishap in the United States. Every year, around 795,000 individuals endure a stroke. Around 600,000 of these are first assaults, and 185,000 are intermittent assaults. Almost three -quarters of all cerebrovascular mishap happen in individuals over the period of 65.15 The danger of having a cerebrovascular mishap dramatically increases every decade after the age of 55. (U.S. Centers for Disease Control and Prevention). As per American Stroke affiliation, cerebrovascular mishap represents 1 of each 19 deaths in the United States (Lay *et al.*, 2011).

In Tamil Nadu, the prevalence of cerebrovascular accident patient was 257/197,596 (100,000 = 130 per lakh), 1 out of 769 population affected by cerebrovascular accident. Males are more affected than females and hypertension was predominant cause of cerebrovascular accident (Bandla *et al.*, 2016). The result from this study helps us to assess the rehabilitative need and to estimate the burden on cerebrovascular accident in rural area. Hence, the study aimed to assess the effectiveness of sensory stimulation on the sensory function among patients with stroke.

## MATERIALS AND METHODS

A total of 30 samples which met the inclusion criteria were selected by using Non-probability convenience sampling technique for the study. After selecting the sample, the investigator introduced

himself and explained the purpose of the study to the patients. Informed consent was obtained after assuring confidence. Each patient were assessed on the bedside. The patient was placed in a comfortable position. The demographic variables were collected by using multiple-choice questionnaires. A sensory stimulation consisting of auditory, visual, olfactory, gustatory and tactile stimulation for 14 consecutive days. Each Stimulation 5-10 min, the sensory function was measured the first day before 30 and after 14th-day intervention using the Sensory Modality Assessment and Rehabilitation Technique (SMART) scale. Auditory stimulation was perform through the record voices of family members, playing music recordings, their preferred music (recently set up in a MP3 Player) was played utilizing earphones for 10 min. Visual stimulation was performed through chunks of multi-colours. The material was performed through the subsequent to washing the hands with cold or heated water and drying them with a towel; the limbs were rubbed with olive oil. Olfactory stimulation was be completed utilizing natural fragrant aromas, lavender oil and gustatory stimulation the mouth was first washed with cold water, and the gums are kneaded with a swab; consequently, a swab dunked in lemon juice was put on the sides of the tongue. Every one of the patients in the intervention group gets these five stimulation once a day for 14 days. The stimulation was performed sequentially with 10-minute rest spans. Every stimulation technique could take 5-10 min; subsequently, the all-out term of tactile stimulation program, including the rest, are around 90 min daily for each patient. The data were tabulated and analyzed by descriptive and inferential statistics.

## RESULTS AND DISCUSSION

The study revealed that most of them 14(46.7%) were in the age group of 61 – 65 years, 21(70%) were male, 25(83.3%) were married, 22(73.3%) belonged to nuclear family, 16(53.3%) had no formal education, 12(40%) were agriculturist, 22(73.3%) had ischemic type of stroke, 14(46.7%) had stroke on right mid cerebral arterial, 30(100%) were staying in hospital for 0 – 2 days and 20(66.7%) were recorded 10 – 12 on Glasgow coma scale.

Table 1 shows that 26(86.7%) had moderate sensory dysfunction and 4(13.3%) had mild sensory dysfunction. Whereas in the post-test after the administration of sensory stimulation, 24(80%) had mild sensory dysfunction and 6(20%) had normal sensory function (Figure 1).

Table 2 shows that the pretest mean score of sensory

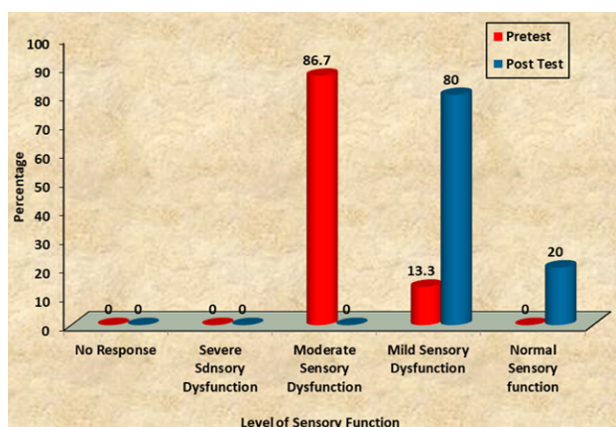
**Table 1: Frequency and percentage distribution of pretest and post-test level of sensory function among patients with stroke**

Sensory Function	No Response		Severe		Moderate		Mild		Normal	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pretest	0	0	0	0	26	86.7	4	13.3	0	0
Post Test	0	0	0	0	0	0	24	80.0	6	20.0

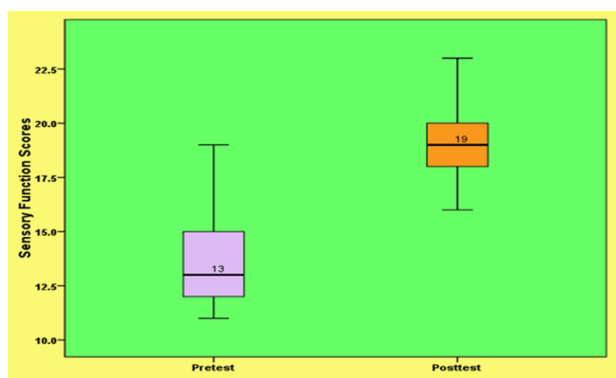
**Table 2: Comparison of pretest and post-test level of sensory function among patients with stroke**

Sensory Function	Mean	S.D	Mean Difference Score	Paired 't' Test
Pretest	13.47	2.08	5.36	t = 26.035
Post Test	18.83	1.68		P = 0.0001 S***

\*\*\*p<0.001, S –Significant



**Figure 1: Percentage distribution of pretest and post-test level of sensory function among patients with stroke**



**Figure 2: Comparison of pretest and post-test level of sensory function among patients with stroke**

function was  $13.47 \pm 2.08$  and the post-test mean score was  $18.83 \pm 1.68$ . The calculated paired 't' test value of  $t=26.035$  was found to be statistically highly significant at  $p<0.001$  level (Figure 2).

The above finding clearly infers that the sensory

stimulation on sensory function administered to patients with stroke was found to be effective in improving the level of sensory function in the post-test.

**CONCLUSIONS**

Impaired neurovascular reactions, deficient cerebral anastomoses just as a later time purpose of stimulation offend this neuroprotective instrument and may even decline stroke result. The investigation discoveries finished up the tactile stimulation improve the tangible capacity. Tangible stimulation is compelling and the patient with tactile capacity among stroke. In any case, stroke patients are now dependent upon broad tangible stimulation during standard consideration, which underlines the desperation and significance of clinical pilot preliminaries.

**Funding Support**

The authors declare that they have no funding support for this study.

**Conflict of Interest**

The authors declare that they have no conflict of interest for this study.

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