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"EFFECTIVENESS OF MULTIMODAL COMA STIMULATION VERSUS RIGHT MEDIAN NERVE STIMULATION ON AROUSAL ACTIVITY AND MOTOR FUNCTION IN SUBJECTS WITH POST STROKE"

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ABSTRACT

Background and Objective: Arousal and motor impairments are frequent complications following stroke, often hindering rehabilitation efforts and leading to less favourable outcomes. Among adjunctive therapies, multimodal coma stimulation and electrical stimulation are commonly employed. In this study, the effects of right median nerve stimulation and multimodal coma stimulation on arousal levels and motor impairment in stroke patients were assessed and compared.

METHODS: A quasi-experimental design was used involving 56 stroke patients aged 45 to 70 years. Participants were randomly assigned to two groups through systematic random sampling, with two individuals excluded from

each group. Group A (n=28) received multimodal coma stimulation combined with conventional physiotherapy, while Group B (n=28) underwent right median nerve stimulation alongside conventional physiotherapy. Interventions were administered five times weekly over eight weeks. The effectiveness of treatments was measured using the Glasgow Coma Scale and. The Fugl-Meyer Test for Motor Function in the Upper Limbs

RESULTS: Independent t-tests examined the mean difference between the groups, while paired t-tests assessed changes within the groups before and after intervention Both groups demonstrated considerable gains in evaluated parameters over time. However, when comparing between groups, multimodal coma stimulation yielded greater improvements than right median nerve stimulation.

CONCLUSION: The present study concluded both multimodal coma stimulation and right median nerve stimulation along with Traditional physical therapy demonstrated notable progress in arousal activity and motor function in post stroke subjects, however multimodal coma stimulation along with traditional physiotherapy was more efficient in comparison to right median nerve stimulation along with traditional physiotherapy. As a result, post-stroke patients may benefit from multimodal coma stimulation in addition to traditional physiotherapy treatment.

KEY WORDS: Post stroke, Arousal activity, Motor dysfunction.

INTRODUCTION

"Stroke is clinically defined as a sudden, localized neurological deficit" caused by vascular damage, either haemorrhagic or ischemic, to the central nervous system.[1] Stroke affects approximately 84 out of every 100,000 people in India.[2]

Ischemic and haemorrhagic strokes are the two primary forms. Ischemic stroke further categorized into three main causes—thrombosis, hypoperfusion, and embolism. Haemorrhagic stroke has two subtypes: intracranial haemorrhage and subarachnoid hemorrhage.[3] "non-modifiable risk factors include family history of stroke, age, male sex, and race."[4]

Primary stroke symptoms commonly involve headache, vomiting, elevated blood pressure, motor impairment, and decreased consciousness.[5] The main post-stroke issues are unconsciousness and motor dysfunction. Consciousness depends on arousal and content, with the reticular formation—stretching from the caudal medulla to the midbrain—being critical for arousal.[6]

Physical rehabilitation utilizes various approaches to treat unconsciousness. Early mobilization, particularly upright positioning via tilt table verticalization, has been proven safe and effective in enhancing cognitive abilities, overall motor function, sensory-motor coordination, vestibular system plasticity, and orthostatic adaptability.[7]

Sensory stimulation is classified as multimodal, involving all five senses, or unimodal, targeting a single sense.[8] This study investigates multimodal coma stimulation, which includes stimulation of smell, hearing, taste, and touch. Olfactory stimulation through aromatherapy and auditory input can activate neurons in the brain. Touch promotes increased blood flow and cerebral circulation, while taste and visual stimuli enhance autonomic nervous system function. This intervention engages multiple senses simultaneously. The ascending reticular activating system (ARAS) helps prevent cell death and improve patient awareness.[9]

Patients undergoing sensory stimulation programs have demonstrated increased consciousness and shorter coma durations. When applied appropriately and with the correct intensity, stimulation can accelerate consciousness recovery, enhance sensory function, and reduce unconsciousness duration.[10]

The median nerve provides a peripheral channel to the central nervous system. Sensory input from the hand corresponds to the ARAS in the brainstem, which regulates alertness. ARAS neurons form synapses with the median nerve's spinorecticular components. Electrical stimulation of the median nerve causes dopamine release, which aids in coma recovery.11

"Stimulation of the median nerve improves pinch strength and supports rehabilitation, enhancing both motor and sensory recovery in post-stroke patients.[12] Over two decades ago, right median nerve electrical stimulation (RMNES) was introduced as a treatment to promote arousal in coma patients." Electrical stimulation of right median nerve has been shown to hasten awakening by activating spinorecticular pathways and possibly increasing cerebral blood flow.[13]

NEED OF THE STUDY

Stroke patients often experience symptoms such as headaches, vomiting, high blood pressure, paralysis, muscle weakness (paresis), lack of coordination (ataxia), abnormal eye movements, speech difficulties, walking problems, bowel and bladder dysfunction, sexual issues, and unconsciousness. The reticular activating system is disrupted by stroke because it affects the central nervous system. which plays a key role in arousal and motor function. To address these challenges, multimodal coma stimulation is used as a therapeutic method to improve arousal and motor abilities in post-stroke individuals, while right median nerve stimulation also shows effectiveness in enhancing these functions.

Although multiple studies have explored the effects of both multimodal coma stimulation and right median nerve stimulation individually, there is a lack of direct comparison between these two approaches.so, the need of the study aims to determine the efficacy of multimodal coma stimulation and right median nerve stimulation in increasing arousal activity and motor performance in post-stroke patients.

AIM OF THE STUDY

The study's goal was to evaluate and compare the effects of multimodal coma stimulation and right median nerve stimulation on arousal activity and motor impairment in poststroke patients.

OBJECTIVES OF THE STUDY

1. To identify the effects of multimodal coma stimulation on arousal activity, and motor functions in subjects with post stroke.
2. To identify the effects of right median nerve stimulation on arousal activity and motor functions in subjects with post stroke.
3. To compare the effect of multimodal coma stimulation and right median nerve stimulation on arousal activity and motor dysfunction and compare then in subjects with post stroke.

HYPOTHESIS

- **RESARCH HYOPHESIS (H1):** Effect of Multimodal coma stimulation is more significant than right median nerve stimulation on arousal activity and motor function in subjects with post stroke.

- **NULL HYPOTHESIS(H0):** The effects of right median nerve stimulation and multimodal coma stimulation on arousal activity and motor function in post-stroke patients are not significantly different.

MATERIALS AND METHODS

STUDY SETTING : Department of Physiotherapy, Tertiary care teaching hospital affiliated to Dr.N.T. R University

ETHICAL CLEARANCE AND INFORMED CONSENT: The study protocol was approved by the Ethical Committee of Swatantra Institute of Physiotherapy & Rehabilitation (Annexure-I), the investigator explained the purpose of the study and given the patient information sheet. The participants were requested to provide their consent to participate in the study (Annexure-II). All the participants signed the informed consent and the rights of the included participants have been secured.

STUDY TYPE : Quasi experimental study

SAMPLING METHOD : Systematic random sampling

STUDY POPULATION: Post stroke Subjects were recruited from General Medicine OPD of Tertiary care teaching hospital affiliated to Dr.NTR University

SAMPLE SIZE : 56 participants that met my inclusion and exclusion requirements and were willing to participate

. $H = Z^2PQ/L^2$, Where Z = 1.96, P = Prevalence of stroke 0.424[(2)], Q=100, P=100-0.424=99.576,

DURATION OF THE STUDY : the study was carried out over a two months period.

DURATION OF INTERVENTION: 3 Sessions per week, for 8 weeks.

STUDY SAMPLE: After screening 60 participants, 56 who satisfied the study's participation requirements were selected at random from the available population. After receiving informed consent, the individuals were categorically assigned to two groups using simple random technique. Random numbers and treatments were printed on sheets of papers; which were folded and the subjects were asked to pick one of them; the individuals were then assigned to the corresponding group based on the paper chosen; Group A received Multimodal Coma Stimulation and conventional physiotherapy for 8 weeks. Group B received Right Median nerve Stimulation and conventional physiotherapy for 8 weeks. The conventional physiotherapy included verticalized body position, early mobilization of patient into upright, passive movements, tilt table verticalization. Baseline age was set to 45-70 years.

Fugl Myer Assessment-upper extremity (FMA-UE) and Gloss Coma Scale (GCS) were used as outcome measures to gather data before and after the intervention.

CRITERIA FOR SAMPLE COLLECTION

INCLUSION CRITERIA:

• Individuals who have had a stroke

• The age range between middle-aged (45–54 years) and elderly (55–70 years)

• GCS scores between seven and thirteen

• Blood glucose levels between 100 and 200 mg/dL; • Temperatures in the range of 36.5 to 37.2°C.

EXCLUSION CRITERIA:

- Death within three days of intervention completion. Subjects with brain stem death.
- Subjects with fractures
- Any recent orthopaedic surgeries
- Sepsis
- Deep vein thrombosis

STUDY TOOLS AND OUTCOME MEASURES

1. **Gloss Coma Scale (GCS):** The gloss coma scale assesses consciousness abilities of individuals. In these 3 responses of eye-opening score from 4-1, verbal responses score from 5-1, and motor responses score from 6-1 the score in between 3 to 15 on their ability to meet their skills [14].

2. **FUGL MEYER ASSESSMENT Upper Extremity (FMA-UE):** The Fugl Meyer Assessment is used to determine the motor function; sensation balance; joint range of motion. In these 0 to 100 points for motor function divided into 66 points for upper extremity and sensation, passive joint motion, joint pain, <84 =hemiplegia 96-99 slight motor dyscoordination. [15]

TREATMENT PROTOCOL:

GROUP A: The multimodal coma stimulation group received conventional physiotherapy followed by sensory stimulation targeting multiple senses: To stimulate brain activity, use the senses of sight, sound, touch, smell, and taste. The tactile sense was stimulated using materials such as feathers, sandpaper, and pieces of fur, while visual stimulation involved objects like snow globes or blinking lanterns. The gustatory sense was activated through popsicles or swabs of spices applied to the tongue. Auditory stimulation was provided using popular music and nature sounds. Subjects underwent three 60-minute sessions per week. Conventional physiotherapy included early mobilization with patients positioned upright, as verticalization helps accelerate alertness. It also involved range of motion exercises, muscle strengthening to improve tone and strength, and balance and coordination training aimed at enhancing proprioception and stability.[16]

GROUP B: The right median nerve electrical stimulation group also received conventional physiotherapy along with RMNES therapy. A 7 cm by 5 cm rubber electrode was put to the skin to provide electrical stimulation after the right forearm was placed in a supine posture and the skin was cleansed with an alcohol swab to lower resistance. Adhesive tape was used to secure the inactive electrode to the right thenar muscles and the active electrode to the median nerve, which was placed 2 cm proximal to the volar side of the right distal forearm. Targeting the right median nerve, electrodes were positioned at the elbow and wrist. Throughout the test, the

stimulation settings were changed every two minutes and included frequencies of 1-4 Hz, 8-12 Hz, and 20-50 Hz with intensities ranging from 2 to 6 mA. In intermittent mode, each session lasted thirty minutes. Alongside this, conventional physiotherapy focused on improving motor function and arousal in post-stroke subjects, particularly upper limb movements including the hand, arm, shoulder, and wrist. Strength and coordination exercises were part of the therapy. Heart rate, blood pressure, and oxygen saturation were among the vital signs that were tracked and modified as necessary. Over the course of four to eight weeks, treatments were given twice a day for thirty minutes each time.[17]

Fig,1: Visual Stimulation

Fig,2: Auditory stimulation

Fig,3: Olfactory stimulation

Fig,4: Right Median Nerve Electrical Stimulation

Fig,5: Electrical Stimulation

FLOW CHART

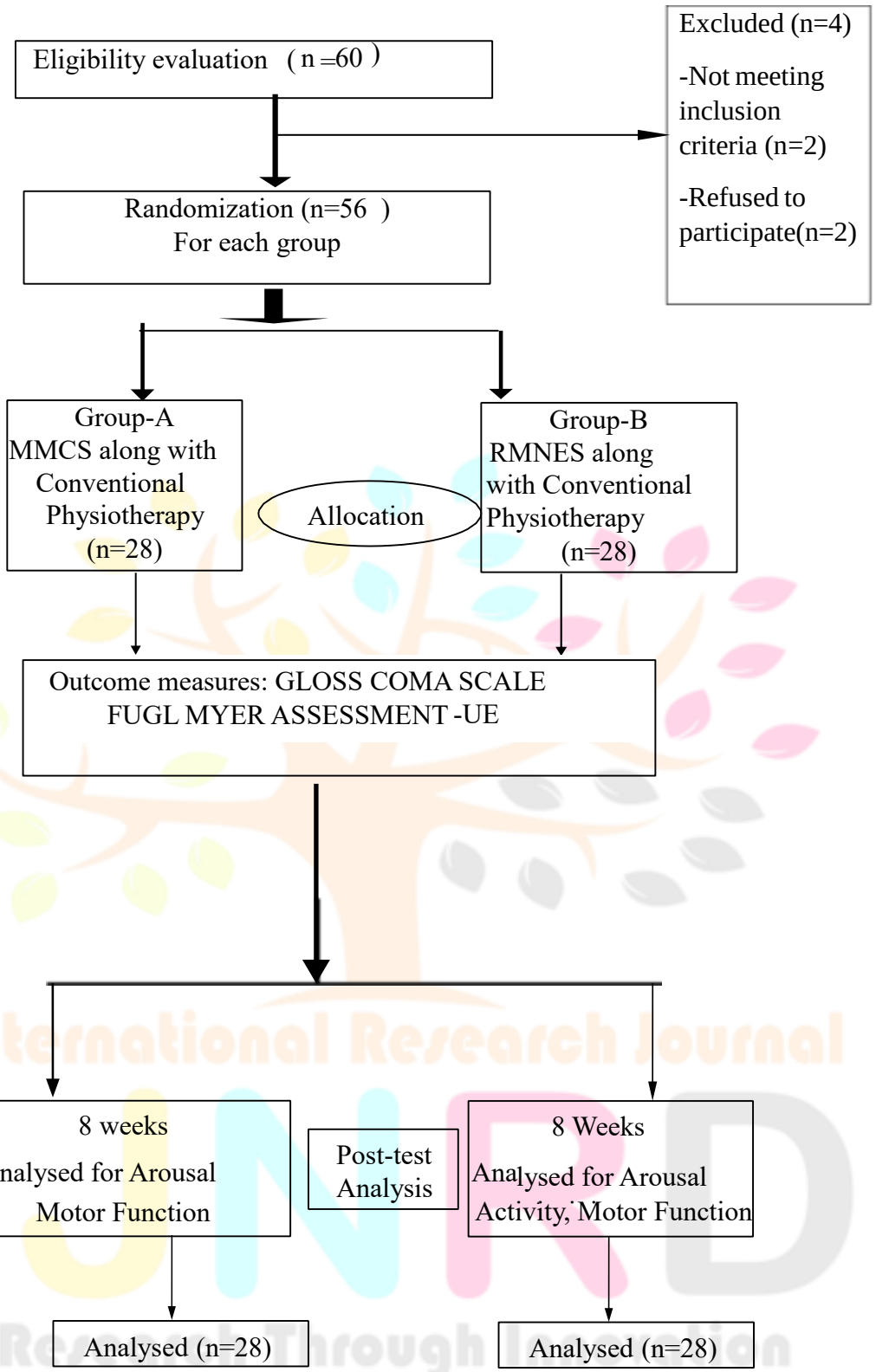
SAMPLING METHOD

ALLOCATION

BASELINE ASSESSMENT – OUTCOMES INTERVENTIONS

OUTCOMES AND DROPOUTS

QUANTICAL YSIS OME



STATISTICAL ANALYSIS

Statistical analysis was done by using SPSS software version and MS excel 2022. The demographic data like standard deviation and mean difference percentage were be calculated and presented.

WITHIN THE GROUPS: paired t-test was performed to assess the statistical difference within the groups.

BETWEEN THE GROUPS: Independent t-test was performed to assess the statistical differences between the groups.

To note the effects of the treatment both before and after it is administered in a group. Statistical tests were used to analyse the Gloss Coma Scale and Fugl Myer Assessment-Upper Extremity outcome measures. 95% confidence intervals were used to determine statistical significance, which was set at $P<0.05$.

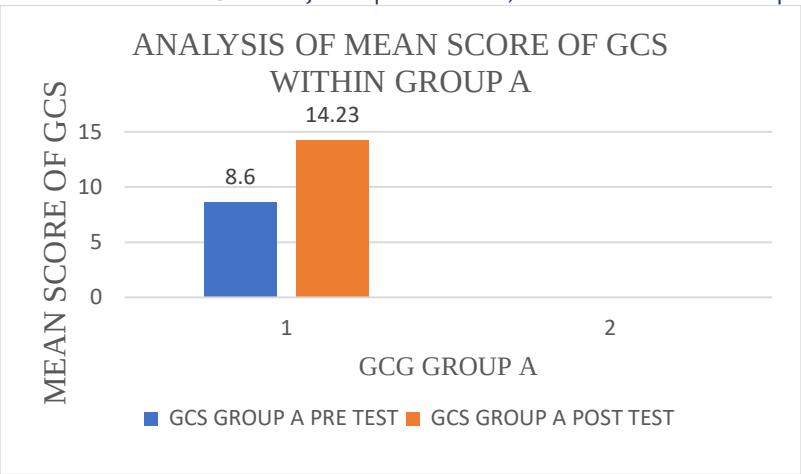
OBSERVATIONS AND RESULTS

DATA ANALYSIS:

ANALYSIS OF MEAN SCORES OF GLOSS COMA SCALE WITH IN GROUP A

Group A	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
PRE-TEST	8.6	1.328	-5.63	15.147	0.0001
POST-TEST	14.23	1.543			

TABLE-1



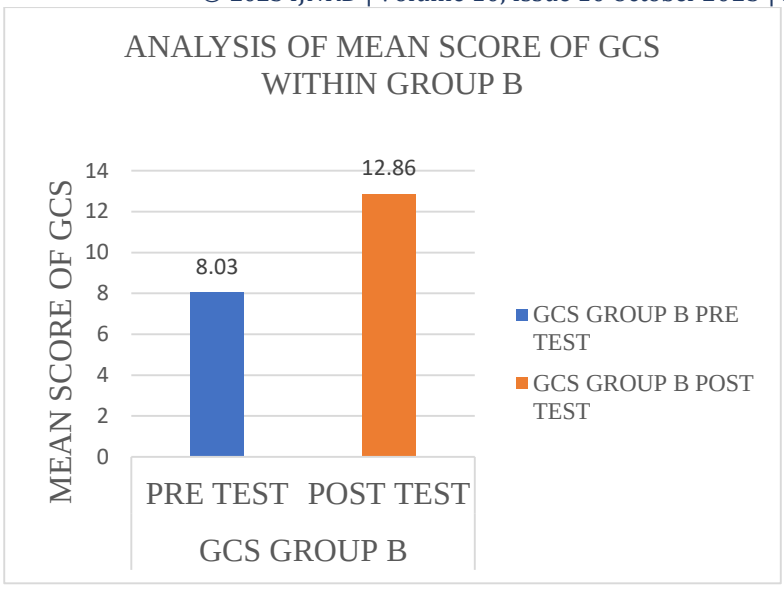
GRAPH -1:

RESULT: The above table and graph show that mean score of Gloss coma scale (GCS) changes from pre-test to post-test values within group A were found to be statistically highly significant ($p<0.005$).

ANALYSIS OF MEAN SCORES OF GLOSS COMA SCALE WITH IN GROUP B

Group B GCS	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
PRE-VALUE	8.03	3.95	-4.8300	6.0116	<0.0001
POST VALUE	12.86	1.94			

TABLE-2



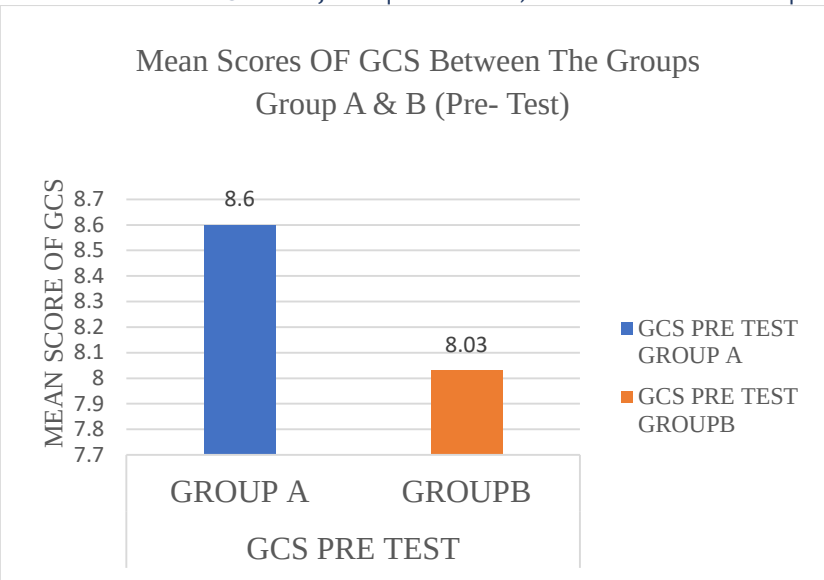
GRAPH- 2

RESULT: The above table and graph show that the mean scores of Gloss Coma scale changes from the pre-test to post-test values within group B were found to be statistically highly significant ($p<0.005$)

COMPARISON OF MEAN SCORES OF GCS BETWEEN THE GROUPS GROUP A & B (PRE- TEST)

GCS-PRE-TEST	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
GROUP A	8.6	1.32	0.5700	0.7496	0.4565
GROUP B	8.03	3.95			

TABLE-3



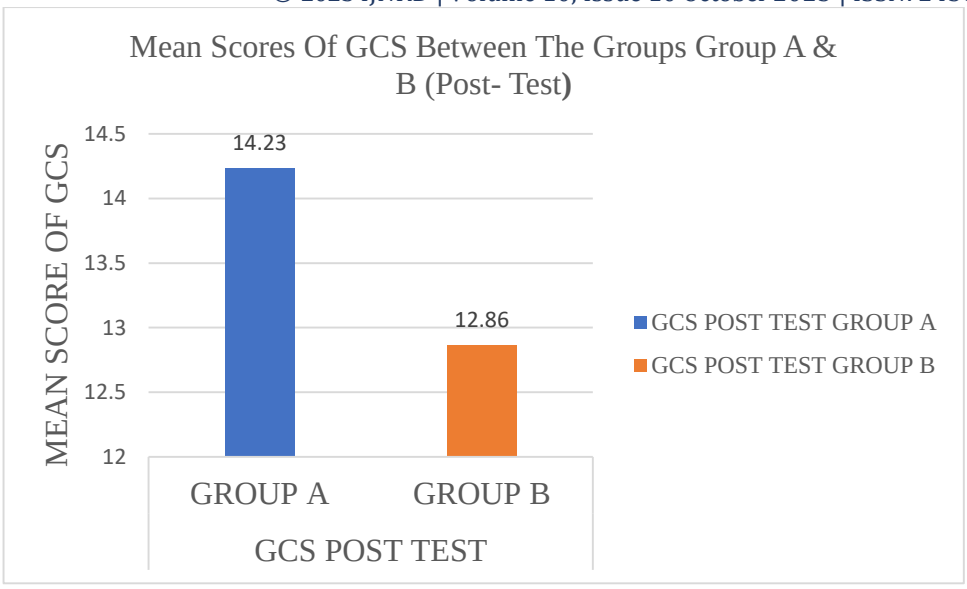
GRAPH- 3

RESULT: The above table and graph show the baseline measurement of Gloss Coma scale in between groups. Gloss Coma score in group A is 8.6 and group B is 8.03 which are found statistically insignificant

COMPARISON OF MEAN SCORES OF GCS BETWEEN THE GROUPS GROUP A & B (POST-TEST)

Gcs post values	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
GROUP A	14.23	1.54	1.3700	3.0295	0.0037
GROUP B	12.86	1.94			

TABLE-4



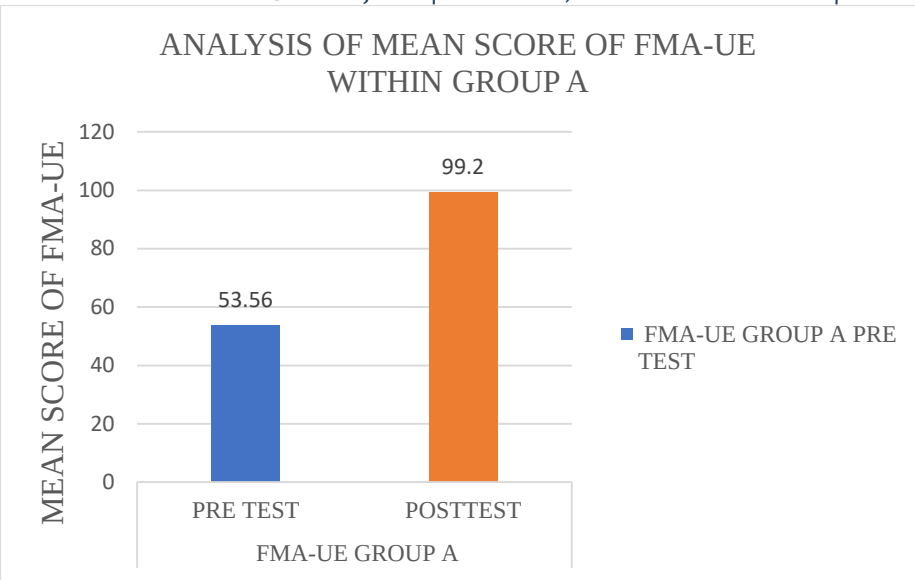
GRAPH- 4

RESULT: The above table and graph show the baseline measurement of Gloss Coma scale in between the groups. Gloss Coma score in group A 14.23is and group B is 12.86which were found statistically highly significant($p<0.005$).

ANALYSIS OF MEAN SCORES FUGL MYER ASSESSMENT -UE WITH IN GROUP A

Group A FMA-UE	**MEAN**	**STAND DEVIATION**	**MEDIAN VARIATION**	**t VALUE**	**P VALUE**
PRE-VALUE	53.56	16.39	-45.64	10.3218	<0.0001
POST VALUE	99.2	17.83			

TABLE-5



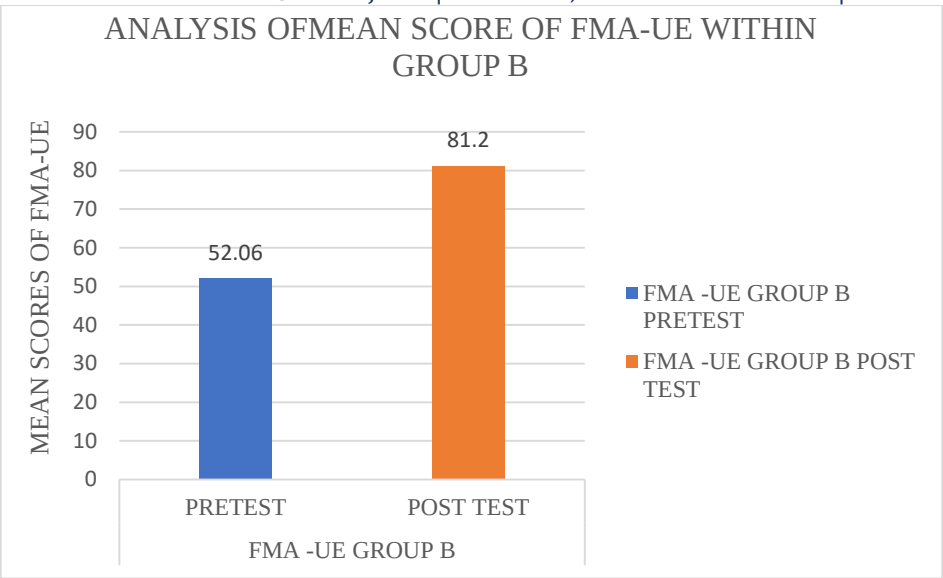
GRAPH- 5

RESULT: The above table and graph show that mean score Of Fugl Myer Assessment -UE changes from pre-test to post-test values within group A were found to be statistically highly significant ($p<0.005$)

ANALYSIS OF MEAN SCORES FUGL MYER ASSESSMENT -UE WITH IN GROUP B

Group B FMA-UE	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
PRE-VALUE	52.06	15.57	-29.1400	6.1562	<0.0001
POST VALUE	81.2	20.73			

TABLE-6



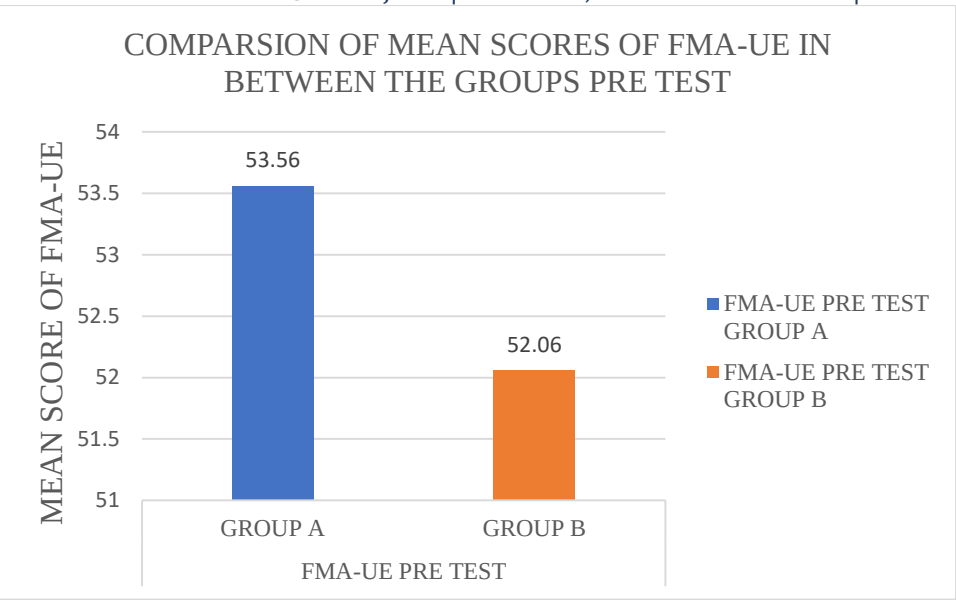
GRAPH-6

RESULT: The above table and graph show that the mean scores of Fugl Myer Assessment -UE changes from the pre-test to post-test values within group B were found to be statistically highly significant ($p<0.005$)

COMPARISON OF MEAN SCORES OF FMA-UE BETWEEN THE GROUPS GROUP A & B (PRE-TEST)

FMA-UE PRE VALUES	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
GROUP A	53.56	16.39	1.500	0.3634	0.7176
GROUP B	52.06	15.57			

TABLE-7



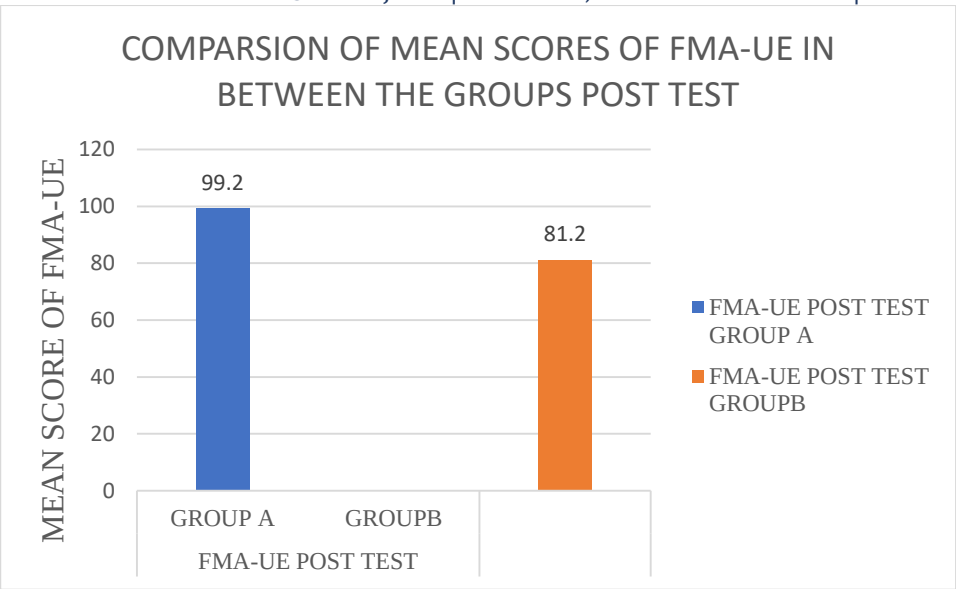
GRAPH :7

RESULT: The above table and graph show the baseline measurement of Fugl Myer Assessment -UE in between groups. Fugl Myer Assessment -UE score in group A 53.56 is and group B 52.06 is which are found statistically insignificant

COMPARISON OF MEAN SCORES OF FMA-UE BETWEEN THE GROUPS GROUP A & B (POST-TEST)

FMA-UE POST VALUES	MEAN	STAND DEVIATION	MEDIAN VARIATION	t VALUE	P VALUE
GROUP A	99.2	17.83	18.00	3.6087	0.005
GROUP B	81.2	20.7			

TABLE-8



GRAPH-8

RESULT: The above table and graph show the baseline measurement of Fugl Myer Assessment -UE in between groups. Fugl Myer Assessment -UE in group A 99.2 is and group B is 81.2 which were found statistically highly significant($p<0.005$).

RESULTS

Age, gender, and duration were comparable between the two groups, and participants started with similar baseline levels of arousal and motor dysfunction. Both the Fugl-Meyer Assessment of the Upper Extremity (FMA-UE) and the Glasgow Coma Scale (GCS) demonstrated extremely significant improvements in the Multimodal Coma Stimulation group, with p-values less than 0.0001. The GCS and FMA-UE scores of the Right Median Nerve Electrical Stimulation group similarly showed extremely significant changes, with p-values less than 0.0001.

There were statistically significant differences in the Glasgow Coma Scale ($p = 0.0037$) and Fugl-Meyer Assessment ($p = 0.006$) after therapy with multimodal coma stimulation and right median nerve electrical stimulation, respectively. Participants in the multimodal coma stimulation group had significantly improved arousal and motor function, with mean scores of 14.23 on the Glasgow Coma Scale and 99.2 on the FMA-UE. Overall, both interventions produced significant enhancements in these outcome measures and were similarly effective in improving arousal and motor dysfunction.

DISCUSSION

Post-stroke individuals often experience unconsciousness and motor impairments, along with other symptoms such as headaches, vomiting, elevated blood pressure, and reduced levels of consciousness.[18] Consciousness is composed of two essential elements: arousal (alertness) and content. The reticular formation, which spans from the lower medulla to the midbrain, plays a crucial role in maintaining arousal.[19]

While multiple studies have demonstrated the benefits of multimodal coma stimulation, there is little direct comparison with right median nerve electrical stimulation. Participants in this study were assessed for changes in arousal and motor function at baseline and post-intervention using the Glasgow Coma Scale and the Fugl-Meyer Assessment. A total of ten people fell out of Group A and B. These findings are consistent with previous studies by Faozi, Ekan, Fadlilah, and Siti, who looked at the influence of multimodal sensory stimulation on stroke patients with reduced consciousness. Their regimen consisted of five 25-minute sessions per day for five consecutive days. Patients who followed this protocol experienced significant improvements in their Glasgow Coma Scale scores.[20]

In Group A, which received multimodal coma stimulation alongside conventional physiotherapy, there was a statistically significant improvement in both the Glasgow Coma Scale and the Fugl-Meyer Assessment ($p < 0.001$). A study by Purbianto and Dwi Agustanti investigated the effects of sensory and tactile stimulation on GCS scores in stroke patients with consciousness disorders. Their sample included 32 participants with GCS scores below 13, assessed over five days. Before treatment, the intervention group had a mean score of 8.31, while the control group scored 11.06. After the intervention, scores rose to 8.94 in the treatment group and 11.12 in the control group. The p-value of 0.006 indicated a significant improvement due to the stimulation.[21]

Khadijeh Sargolzaei and Nahid Shaghaee Fallah reported that nearly half of stroke patients suffer from consciousness disorders, often accompanied by sensory deprivation. Their study demonstrated that using simple and accessible sensory stimuli during therapy can enhance sensory function and help prevent deprivation in these patients.[22]Caitlin Costanzo, Chelsea Shade, and colleagues conducted a three-week trial using a low-intensity multimodal sensory stimulation protocol combined with physical therapy for patients with acute CVA. The patient

showed increased alertness and was able to follow simple commands, indicating improved arousal due to the stimulation.[23]

Sheren Mohammed Diab, Zeinab Faried Bahgat investigated the effect of Multimodal Sensory Stimulation (MMSS) on consciousness and cognitive function in 100 acute stroke patients. The study found that MMSS significantly improved consciousness and cognitive performance in stroke patients. MMSS showed significant improvements in consciousness and cognitive function. Patients receiving MMSS had better outcomes compared to the control group.[24]

Group B, which received right median nerve electrical stimulation along with conventional physiotherapy, also showed statistically significant improvements in GCS and Fugl-Meyer scores. The sensory distribution of the hand is linked to the ascending reticular activating system (ARAS) in the brainstem, which is essential for maintaining wakefulness. Neurons in the ARAS are synoptically connected to the spinorecticular pathway of the median nerve. Electrical stimulation of this nerve boosts dopamine release, aiding in coma recovery and enhancing speech and awareness.[25]

Rui Li, Jingyi Lu, and colleagues studied peripheral electrical nerve stimulation and its effects on hand function during stroke rehabilitation. They developed ultrasound-guided median nerve electrical stimulation (UG-MNES) and tested its efficacy in stroke patients with upper limb deficits. Sixty-three patients, 2-3 months post-stroke, were randomly assigned to either the control or the UG-MNES groups. Both groups received conventional therapy, but the UG-MNES group also had 20-minute bouts of stimulation at 2 Hz with a pulse width of 0.2 Ms. The Fugl-Meyer Assessment of upper limb motor function was the major outcome, with the Functional Test for the Hemiplegic Upper Extremity and the Hand Function Rating Scale serving as secondary measures. After four weeks, the UG-MNES group exhibited much larger increases, with noticeable gains beginning with the first session. This therapy proven to be both safe and successful for improving motor function in stroke patients.[26]

Transdermal electrical stimulation, which turns electrical currents into nerve impulses, is capable of reaching the brainstem, thalamus, and cerebellum. Activating the hormonal system of the brain and ARAS neurons, which are responsible for wakefulness, can lead to increased consciousness.[27]

Jhenge Dao Yang, Chun-De Liao, and their team conducted a systematic review and meta-analysis of 48 randomized controlled trials to assess the effectiveness of electrical stimulation therapy in improving arm

function after stroke. Their findings showed that patients in the electrical stimulation group had better outcomes on the Action Research Arm Test compared to those in the placebo group, immediately following treatment.[28]

Neha Raichur, Raghavendra Singh Dharwadkar, compared two therapies, transcranial direct current stimulation (tDCS) and right median nerve stimulation (RMNS), to improve arousal in patients with altered consciousness due to brain injury. Both methods showed significant improvements in patient outcomes after two weeks, with no statistically significant difference between the two groups, suggesting they're equally effective. However, tDCS showed a greater improvement in effect size compared to RMNS.[29]

Darda, Palak P., Jethwani, and colleagues developed a The study protocol aims to investigate the combining effects of neuromuscular electrical stimulation (NMES) and proprioceptive neuromuscular facilitation (PNF) on upper limb recovery in hemiplegic stroke patients. The study intended to enrol 26 eligible people, splitting them into two groups: one receiving conventional therapy and the other receiving a combination of conventional therapy, PNF and NMES.The six-week intervention would be evaluated using multiple outcome measures, including the Glasgow Coma Scale, Mini-Mental State Examination, Modified Ashworth Scale, Modified Barthel Index, and Action Research Arm Test. The results are expected to offer valuable insights into the benefits of combining NMES and PNF for stroke rehabilitation.[30]

IMPLICATIONS OF THE STUDY

Following a stroke, patients commonly experience reduced arousal and motor dysfunction, which can lead to impaired consciousness, decreased mobility, loss of independence, and difficulties performing daily activities. Multimodal coma stimulation has been shown to be an effective approach for enhancing arousal and motor function in post-stroke patients. This method is proven to be safe and can be integrated into standard therapeutic practices.

Therefore, physiotherapy programs can adopt these protocols to support post-stroke patients with issues related to arousal and motor impairment.

LIMITATIONS OF THE CURRENT STUDY:

- Only a small sample was used in study so the results couldn’t be generalized.

- The intervention was given for a smaller duration which may have affected the efficacy of the treatment.
- There is a lack of follow-up of the subjects following the intervention duration.
- Only Monocentric was taken.

RECOMMENDATIONS FOR FURTHER RESEARCH

• To improve the reliability of results, future research should use a more rigorous randomization technique and a larger sample size.

• Using blinding or objective outcome measurements can reduce potential bias and improve the validity of results.

• Long-term follow-up assessments may improve the study's evaluation of intervention effectiveness over time.

CONCLUSION

In summary, this study shows that an eight-week treatment program leads to significant improvements in arousal and motor function in individuals recovering from stroke. Both multimodal coma stimulation and right median nerve stimulation, when combined with conventional physiotherapy, produced notable enhancements in these areas. However, multimodal coma stimulation paired with conventional physiotherapy proved to be more effective than right median nerve stimulation with conventional physiotherapy. Therefore, incorporating multimodal coma stimulation alongside conventional physiotherapy could be a valuable approach in the rehabilitation of post-stroke patients

SUMMARY

TITLE: EFFECTIVENESS OF MULTIMODAL COMA STIMULATION VERSUS RIGHT MEDIAN NERVE STIMULATION ON AROUSAL ACTIVITY AND MOTOR FUNCTION IN SUBJECTS WITH POST STROKE.

PURPOSE: The purpose of the study was to compare the Effect of Multimodal coma stimulation versus Right Median nerve stimulation on Arousal activity and Motor function in subjects with post stroke

METHODS: A quasi-experimental design was used involving 56 stroke patients aged 45 to 70 years. Participants were randomly assigned to two groups through systematic random sampling, with two individuals excluded from each group. Group A (n=28) received multimodal coma stimulation combined with conventional

physiotherapy, while Group B (n=28) underwent right median nerve stimulation alongside conventional physiotherapy. Interventions were administered five times weekly over eight weeks. The effectiveness of treatments was measured using the Glasgow Coma Scale and. The Fugl-Meyer Test for Motor Function in the Upper Limbs

RESULTS: Independent t-tests examined the mean difference between the groups, while paired t-tests assessed changes within the groups before and after intervention Both groups demonstrated considerable gains in evaluated parameters over time. However, when comparing between groups, multimodal coma stimulation yielded greater improvements than right median nerve stimulation.

CONCLUSION: The present study concluded both multimodal coma stimulation and right median nerve stimulation along with Traditional physical therapy demonstrated notable progress in arousal activity and motor function in post stroke subjects, however multimodal coma stimulation along with traditional physiotherapy was more efficient in comparison to right median nerve stimulation along with traditional physiotherapy. As a result, post-stroke patients may benefit from multimodal coma stimulation in addition to traditional physiotherapy treatment.

KEY WORDS: Post stroke, Arousal activity, Motor dysfunction.

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