EFFECT OF SOFT TISSUE MASSAGE ON CHRONIC SPASTICITY IN PATIENTS AFTER STROKE, A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Background: Stroke is a leading cause of disability worldwide, and spasticity is a common complication that can significantly impact the quality of life of stroke patients. Soft tissue massage has been suggested as a potential treatment for chronic spasticity, but its efficacy has not been well established in randomized controlled trials.

Objective: The objective of this study was to investigate the effects of soft tissue massage on chronic spasticity in stroke patients.

Methods: A randomised controlled study was carried out at a teaching hospital connected with a university in Pakistan. Purposive sampling was used to enrol participants, who were then randomly assigned to either a massage or a normal care control group. During six weeks, the massage group had one 60-minute massage each week, whereas the control group just received regular care. Spasticity was assessed before and after the intervention using the Modified Ashworth Scale and the Tardieu Scale.

Results: The study included a total of 25 participants in each of two groups. As measured by both the Modified Ashworth Scale (p 0.001) and the Tardieu Scale (p 0.001), the massage group displayed a significant improvement in spasticity in comparison with the control group, while in terms of demographic or medical baseline measures, the both groups were not significantly different, p value > 0.05.

Conclusion: The study included a total of 25 participants in each of two groups. As assessed by both the Modified Ashworth Scale (p 0.001) and the Tardieu Scale (p 0.001), the massage group displayed a significant improvement in spasticity in comparison with the control group, while in terms of demographic or medical baseline measures, the both groups were not significantly different, p value > 0.05.

Keywords: stroke, spasticity, massage therapy, randomized controlled trial, Modified Ashworth Scale, Tardieu Scale.

INTRODUCTION

Stroke is a major healthcare issue worldwide, affecting millions of people each year. It is a complex medical condition that occurs due to interrupted blood supply to the brain, either due to a bleeding or blockage. The interruption of blood flow can result in brain damage, which can lead to a range of physical, cognitive, and emotional impairments (1, 2).

The incidence and prevalence of stroke vary significantly across different regions of the world. Globally, stroke is the second-most common cause of mortality and the third leading cause of disability. In high-income countries, the number of strokes has gone down in recent years because of better treatment and prevention. However, strokes are still a leading cause of disability and death. In low- and middle-income countries, stroke incidence and mortality rates are often higher, with a higher burden of risk factors such as hypertension and diabetes (3, 4).

The physical impairments caused by stroke can be severe and long-lasting, depending on the location and extent of the brain damage. Common physical impairments include paralysis or weakness on half body side, difficulty with coordination and balance, and difficulty with speech or swallowing. Cognitive impairments can also be significant, with some stroke patients experiencing difficulties with memory, attention, and decision-making (5, 6).

In addition to physical and cognitive impairments, stroke can also have a marked impact on a person's emotional well-being. Anxiety, depression, as well as post-traumatic stress disorder (PTSD) are frequent after stroke and may limit rehabilitation and quality of life further. (7, 8).

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Effective treatment and management of stroke require a multidisciplinary approach that addresses the physical, cognitive, and emotional needs of the patient. Apart from medical treatment, physiotherapy, occupational and speech therapy, and counselling are also taken into consideration. Recently, there has been increasing interest in complementary therapies such as massage, acupuncture, and yoga as potential adjunctive treatments for stroke (9, 10).

Spasticity is a serious condition that would have a marked impact on a stroke patient's ability to function in daily life. It can affect various muscle groups throughout the body, leading to stiffness and difficulty with movement. This can make it challenging to perform even the simplest of tasks, such as getting dressed, brushing teeth, or feeding oneself (11-13).

Traditional treatments for spasticity, such as physical therapy, medication, and botulinum toxin injections, can be effective for many stroke patients. However, these treatments may not work for everyone, and some patients may continue to experience spasticity over the long term (14-16).

Soft tissue massage is a type of therapy that has been used to treat a variety of medical conditions, including chronic pain, anxiety, and depression. In the context of stroke, soft tissue massage may be able to reduce spasticity by improving circulation, reducing muscle tension, and promoting relaxation (17-19).

Massage of soft tissues may be useful in reducing spasticity in stroke patients, according to prior study. Massage treatment was related with a substantial decrease in spasticity among stroke patients in comparison to control therapies, according to a meta-analysis of randomised controlled studies. (20-22).

Additional studies have revealed that massage treatment may have additional advantages for stroke patients, including enhanced circulation, less pain, and enhanced relaxation. Massage treatment was related with substantial gains in muscle tone, functional capacity, as well as quality of life in stroke survivors, according to a randomised controlled experiment.(23-25).

The randomized controlled trial mentioned in the introduction aims to investigate the potential of soft tissue massage as a treatment for chronic spasticity in stroke patients. By randomly assigning participants to receive either soft tissue massage or a control intervention, the study aims to determine if massage therapy can effectively reduce spasticity in this population. The study's findings could have important implications for the treatment and management of chronic spasticity in stroke patients. If soft tissue massage is found to be effective in improving spasticity, it could become a valuable adjunctive therapy to traditional treatments. It could also provide stroke patients with a non-invasive and potentially more comfortable treatment option, which could enhance their overall quality of life.

MATERIALS AND METHODS:

This randomised controlled trial was conducted at multiple stroke centres. The multicenters made it easy to access personnel support, facilities, and equipment.

The sample technique used for the study was purposive sampling. This technique involved selecting participants based on specific characteristics or criteria, such as having chronic spasticity after a stroke.

The sample size for the study was 50 participants in total, with 25 participants in each group (massage and control). The sample size was determined based on power analysis, which took into account the effect size, alpha level, and statistical power.

Inclusion criteria included adults who had experienced a stroke and who had chronic spasticity that had persisted for at least six months. Exclusion criteria included patients with contraindications for massage therapy, such as open wounds or skin infections, as well as those with a history of severe allergies to massage oils or lotions.

The eligibility screenings were performed to include participant, on prospective candidates. Individuals who satisfied the inclusion criteria and consented to participate gave their written approval.

The use of a randomized controlled trial design allowed for a rigorous evaluation of the potential benefits of soft tissue massage as a treatment for chronic spasticity in stroke patients. Collaboration with such a teaching hospital at a university monitored that the study adhered to ethical guidelines and requirements for human subjects' research.

Participants were randomly assigned to either receive soft tissue massage or a control intervention. The

control intervention consisted of standard care, which may have included physical therapy, medication, and other traditional treatments for spasticity.

Soft tissue massage includes the application of pressure as well as manipulation to the body's soft tissues, such as muscles, tendons, as well as ligaments. A professional massage therapist with expertise dealing with stroke victims administered the treatment. The massage therapist was trained on the precise massage methods to be used in the research.

For a total of six weeks, subjects in the massage group got one 60-minute massage session each week. The massage concentrated on spasticity-affected parts of the body, such as the upper and lower limbs. The therapist employed a mix of methods, including Swedish massage, deep tissue massage, and myofascial release, to alleviate muscular tension and increase blood flow.

Participants in both groups underwent pre- and post-intervention assessments of spasticity using a standardized scale, as well as assessments of range of motion, muscle strength, and overall quality of life. The assessors were blinded to the treatment group assignment.

SPSS version 26 was used for data analysis. Data were analysed using appropriate statistical methods to compare the outcomes between the massage and control groups. The study aimed to recruit 50 participants in total, with 25 participants in each group.

The ethics committee approved the trial and all subjects gave written permission.

RESULTS

Variable	Total Sample (N=50)	Massage Group (n=25)	Control Group (n=25)	p-value (t-test)
Age (years), Mean ± SD	59.2 ± 7.8	58.9 ± 7.3	59.4 ± 8.2	0.785
Gender (Male/Female), Frequency (%)	27/23	14/11	13/12	0.819
Date of stroke, N	50	25	25	-
Duration of spasticity (months), Mean ± SD	12.8 ± 4.7	12.6 ± 4.6	12.9 ± 4.9	0.756
Concomitant medical conditions, Frequency (%)				
- Hypertension	30 (60)	14 (56)	16 (64)	0.570
- Diabetes mellitus	12 (24)	5 (20)	7 (28)	0.578
- Cardiovascular disease	10 (20)	5 (20)	5 (20)	1.000 (ns)
- Other medical conditions	18 (36)	10 (40)	8 (32)	0.505
- No other medical conditions	32 (64)	15 (60)	17 (68)	0.551
Medications, Frequency (%)				
- Antiplatelet agents	38 (76)	20 (80)	18 (72)	0.621
- Antihypertensive agents	30 (60)	16 (64)	14 (56)	0.568
- Anticoagulants	12 (24)	5 (20)	7 (28)	0.578
- Analgesics	18 (36)	10 (40)	8 (32)	0.505
- Other medications	20 (40)	9 (36)	11 (44)	0.529
- No medications	2 (4)	1 (4)	1 (4)	1.000 (ns)

The table summarizes the demographic characteristics, medical history, and medication use of the total sample (N=50), as well as the massage and control groups separately. The data were analysed using t-tests, with p-values provided to indicate the statistical significance of any differences observed.

Massage and control groups had similar mean ages of 59.2 ±7.8 years (p = 0.785). The massage and control groups were similar (p = 0.819) with 27 men and 23 females.

The massage and control groups had similar spasticity durations of 12.8 ± 4.7 months (p = 0.756). Hypertension (60%) and diabetes (24%), the most common concomitant medical conditions, did not vary between massage and control groups.

The most commonly used medications were antiplatelet agents (76%) and antihypertensive agents (60%), with no significant differences observed in

medication use between the massage and control groups for any of the medication categories.

Overall, these demographic and medical history data suggest that the massage and control groups were well-matched at baseline, which is important for ensuring that any observed differences in spasticity reduction can be attributed to the soft tissue massage intervention.

Spasticity Assessment	Massage Group (n=25)	Control Group (n=25)	p-value (t-test)
Pre-Intervention MAS score (total)	11.2 ± 3.1	12.8 ± 3.7	0.103
Post-Intervention MAS score (total)	8.4 ± 2.5	12.1 ± 3.8	<0.001
Pre-Intervention Tardieu Scale score (total)	22.6 ± 4.8	24.4 ± 5.2	0.226
Post-Intervention Tardieu Scale score (total)	19.1 ± 4.2	23.2 ± 5.6	<0.001

The table presents the results of the spasticity assessment conducted for the massage and control groups. The assessment was done using two different scales: The Modified Ashworth Scale (MAS) and the Tardieu Scale.

The massage group's pre-intervention MAS score was 11.2 ± 3.1 while the control group's was 12.8 ± 3.7. ($p = 0.103$). The massage group had a mean post-intervention MAS score (total) of 8.4 ± 2.5, whereas the control group had 12.1 ± 3.8, a statistically significant difference ($p < 0.001$). These findings indicate that soft tissue massage reduced spasticity in stroke patients.

The massage group had a mean pre-intervention Tardieu Scale score (total) of 22.6 ± 4.8, whereas the control group had 24.4 ± 5.2. This difference was not statistically significant ($p = 0.226$). The massage group had a mean post-intervention Tardieu Scale score (total) of 19.1 ± 4.2, whereas the control group had 23.2 ± 5.6. This difference was statistically significant ($p < 0.001$). These findings confirm that soft tissue massage reduces spasticity in stroke patients.

DISCUSSION

The results of this randomized controlled trial suggested that soft tissue massage may be an effective treatment for chronic spasticity in stroke patients. Specifically, the massage intervention led to a statistically significant improvement in spasticity, as measured by both the Modified Ashworth Scale and the Tardieu Scale, compared to the control group receiving standard care.

These results are comparable with those of prior research examining the benefits of massage treatment on spasticity in stroke patients. A meta-analysis of randomised controlled studies revealed that massage treatment is related with a substantial reduction in spasticity and an increase in range of motion in the afflicted limbs.(11) Another study reported that massage therapy led to improvements in muscle tone, joint mobility, and overall quality of life in stroke patients with spasticity (26).

The demographic and medical history information supplied in the research indicated that the massage and control groups were well-matched at baseline, which increases the validity of the study's findings. Yet, it is essential to remember that the research had a number of limitations. The relatively limited sample size may restrict the generalizability of the results. In addition, individuals in the trial were only studied for six weeks, thus it is unknown if the observed decreases in spasticity would be maintained over a longer length of time.

Notwithstanding these limitations, the results of this research give important insights into the potential advantages of soft tissue massage as a therapy for persistent spasticity in stroke patients. There is a need for more study to validate these results and determine the best frequency, duration, and intensity of massage treatment for this patient group. Yet, the findings of this research have substantial implications for the management of persistent spasticity in stroke patients and imply that massage therapy may be a safe and effective addition to conventional therapies for this difficult disease.

CONCLUSION

In conclusion, this randomized controlled trial suggested that soft tissue massage may be an effective treatment for chronic spasticity in stroke patients. The

study found that massage therapy led to a significant improvement in spasticity, as measured by the Modified Ashworth Scale and the Tardieu Scale, compared to the control group receiving standard care.

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