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Gender-Based Evaluation of IASTM and Dry Needling Therapy on Spasticity and Pain in Neurological Patients: A 12-Month Experimental Study

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ABSTRACT

Background: Spasticity and pain frequently affect neurological patients, limiting function and quality of life. This study evaluated the gender-based effectiveness of combining Instrument-Assisted Soft Tissue Mobilization (IASTM) and dry needling therapy. Pre- and post-treatment assessments using the Modified Ashworth Scale (MAS) and Visual Analogue Scale (VAS) showed significant reductions in spasticity and pain, demonstrating the therapeutic potential of this combined intervention.

Methodology: A 12-month Gender based experimental study was carried on total of 60 neurological patients (≥40 years old) who had spasticity in neurological disorders had IASTM and dry needling therapy three times a week for 45 minutes each session for 2.5 months. VAS and MAS were used to measure pain and spasticity.

Results: The mean MAS and VAS scores significantly decreased after treatment in both genders. In males, MAS reduced from 1.66 to 1.07 and VAS from 6.48 to 3.33. In females, MAS decreased from 1.71 to 1.11 and VAS from 6.58 to 3.41, indicating treatment effectiveness.

Conclusion: The study supports IASTM and dry needling as effective therapies, warranting broader trials and long-term follow-up for validation

Keywords: *neurological condition, Modified Ashworth Scale, Instrument Assisted Soft Tissue Mobilization, Visual Analogue Scale*

1. INTRODUCTION

Neurological problems include a wide range of illnesses that can impact the brain, spinal cord, peripheral nerves, and neuromuscular junctions, and among other parts of the nervous system. These disorders may result from infections, autoimmune reactions, degenerative processes, severe injuries, vascular problems, or genetic abnormalities[1]. Depending on

the particular region and function of the nervous system, there are numerous neurological conditions, like multiple sclerosis (MS), stroke, Parkinson's disease (PD), and various additional neurological diagnoses. Spasticity is usually linked to reduced mobility, challenges in activities of daily living (ADL), and diminished quality of life (QOL)[2]. The widely acknowledged definition of spasticity is "a motor disorder characterized by a velocity-dependent increase in tonic stretch reflexes with exaggerated tendon jerks, resulting from hyperexcitability of the stretch reflex. Spasticity varies from being a clinical sign with no functional impact to being a gross increase in tone interfering with mobility, transfers and personal care. Untreated, it can cause shortening of muscles and tendons, leading to con-tractures. One of the most prevalent conditions among traumatic brain injury (TBI) sufferers is spasticity, affecting as many as 20% of individuals with moderate-to-severe TBI. An acute subdural hematoma, which may occur in up to 20% of individuals with TBI, can be linked to contralateral spastic hemiplegia, a lesion with physiopathology kin to that of vascular-origin brain lesions[5]. According to WHO, stroke was the second biggest cause of death globally with two-thirds of those deaths occurring in less developed nations[3]. Following spinal cord injury (SCI), chronic pain and stiffness are frequent clinical symptoms that negatively affect quality of life [7]. Alternative methods like Dry Needling (DN) have been employed recently to treat spasticity[9].

2. METHODOLOGY

An experimental interventional type of study was conducted in the Department of Neurology at Pacific College of Physiotherapy, Pacific Medical University, Udaipur, Rajasthan, with in a duration of 12 months. The present study has been approved from Institutional Ethical Committee (PMU/PMCH/IEC/2024/294). This study has enrolled a total of 60 patients of either gender with age group of ≥40 years and had neurological disorders with spasticity. Enrolled sixty patients with spasticity in neurological conditions categorised into male and female (experimental group) and have been followed by intervention treatment of IASTM therapy and dry needling treatment session of 45 minutes for three times a week. The present study measured the MAS score for spasticity during movement and used VAS for discomfort. Participants who were allergic to IASTM or dry needling, or who had any other sensitive diseases, were not allowed to participate in this study. Prior to enrolment, both verbal and written consent were obtained. Confidentiality of the patients was preserved.

3. RESULTS

Graph 1: Gender Wise Distribution of Participants

GROUPS	Frequency
Gender	Female: 20 (33%)
	Male: 40 (60%)

Graph 1: Age Wise Distribution of Participants

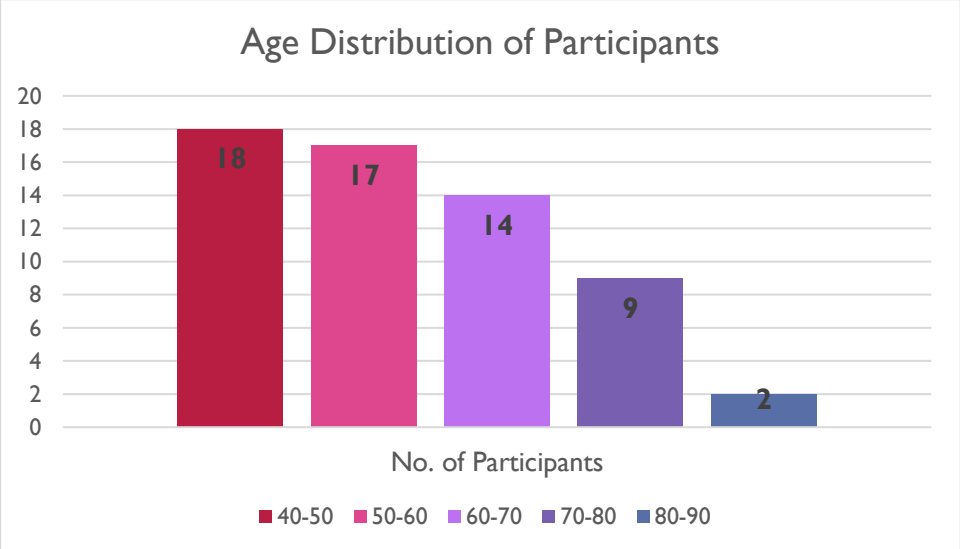

Table 2: Comparison of Pre and Post treatment score or Spasticity among Male and Female Based on MAS

Outcome Measures	Pre-Test (Mean ± SD)		Post - Test (Mean ± SD)		P Value
	Male	Female	Male	Female	
Spasticity	1.66 ± 0.12	1.71 ± 0.21	1.07 ± 0.22	1.11 ± 0.15	<0.001

Table 3: Comparison of Pre and Post treatment score among Male and Female for Pain Based On VAS

Outcome Measures	Pre - Test (Mean ± SD)		Post - Test (Mean ± SD)		P Value
	Male	Female	Male	Female	
Pain	6.48 ± 0.38	6.58 ± 0.72	3.33 ± 0.33	3.41 ± 0.34	<0.001

4. DISCUSSION

Spasticity characterized by increased muscle tone, spasms, hyperreflexia, clonus, and occasional contractures is a hallmark of **upper motor neuron syndromes**. It frequently arises in conditions such as stroke, TBI, SCI, MS varying in prevalence from roughly one-third to over 90%, depending on the condition.[10]

The present study enrolled a total of 60 patients with neurological conditions associated with spasticity. These patients were evaluated to assess the pre- and post-treatment effects of IASTM and DN therapy among male and female.

In patients with neurological conditions, Instrument-Assisted Soft Tissue Mobilization and Dry Needling therapy were evaluated for their effects on key clinical parameters such as pain and muscle tone. The findings of the present study align with existing literature, as several previous studies have reported favorable outcomes regarding the reduction of pain and improvement in muscle tone following these interventions. The mean age of the study population was 57.87 ± 11.8 years, comprising 67% males and 33% females (Table 1).

The subjects in the study were further categorized into five distinct age groups for detailed analysis: 40–50, 50–60, 60–70, 70–80, and 80–90 years. The distribution revealed that the majority of participants fell within the 40–50 age group, comprising 30% of the total sample. This was followed by 28% in the 50–60 age group, 23% in the 60–70 age group, 15% in the 70–80 age group, and the smallest proportion, 3%, in the 80–90 age group. These findings are presented in detail in (Table/Graph 1). the present study also evaluated muscle tone using the Modified Ashworth Scale (MAS) within a single experimental group, comparing pre- and post-treatment scores among male and female. The mean MAS score before treatment was in male 1.66 ± 0.12 and in female is 1.71 ± 0.21, which significantly decreased after intervention that is in male 1.07 ± 0.22 and in female 1.11 ± 0.15 respectively (Table 2). These findings indicate a notable reduction in spasticity, suggesting that the applied therapeutic approach was effective in decreasing muscle tone in patients with neurological conditions. The mean pre-treatment VAS score was in male 6.48 ± 0.38 and in female 6.58 ± 0.72. which significantly decreased after intervention to 3.33 ± 0.33 in male and 3.41 ± 0.34 in female respectively (Table 3). These findings suggest that the use of IASTM and dry needling therapy in patients with neurological conditions is effective in reducing pain intensity.

5. CONCLUSION

- The present study highlighted a Significant reduction in both MAS and VAS scores in male and female participants.
- This could add potential therapeutic impact on this intervention. These results support its inclusion as a beneficial component in neurorehabilitation programs for managing spasticity and pain.
- The positive outcomes of this study suggest promising future directions for integrating IASTM and dry needling into standard neurorehabilitation protocols.
- Further large-scale, multi-centered trials could help validate these findings across diverse populations and neurological conditions.

Long-term follow-up studies are recommended to assess the sustained effects of the therapy.

REFERENCES

[1] Kanase, Suraj & Salunkhe, Pragati & Durgawale, Ankita. (2024). Neurological Rehabilitation: Techniques and Outcomes in Physiotherapy.. African Journal of Biological Sciences. 6. 1562-1581.

[2] Mukherjee A, Chakravarty A. Spasticity mechanisms - for the clinician. Front Neurol. 2010 Dec 17;1:149.

[3] Kheder A, Nair KP. Spasticity: pathophysiology, evaluation and management. Pract Neurol. 2012 Oct;12(5):289-98. doi: 10.1136/practneurol-2011-000155. PMID: 22976059.

[4] Cruz-Montecinos C, Núñez-Cortés R, Bruna-Melo T, Tapia C, Becerra P, Pavez N, Pérez-Alenda S. Dry needling technique decreases spasticity and improves general functioning in incomplete spinal cord injury: A case report. J Spinal Cord Med. 2020 May;43(3):414-418.

[5] Young RJ, Destian S. Imaging of traumatic intracranial hemorrhage. Neuroimaging Clin. 2002;12(2):189–204.

[6] Shruti Deshpande,Jeba Chitra Effectiveness of Instrument Assisted Soft Tissue Mobilization Using M2 t Blade on Upper Limb Spasticity and Function in Post Stroke Patients: A Pre-Post Experimental Study.International Journal of Medical Science and Innovative.2018;4(3):310 – 316

[7] Carusotto, Anthony & Hakim, Renee & Oliveira, Rebecca & Piranio, Alyssa & Coughlan,

[8] Conor & MacDonald, Thomas. (2021). Effects of dry needling on muscle spasticity in adults with neurological disorders: a systematic review. Physical Therapy Reviews. 26. 1- 10.1080/10833196.2021.1933339.

[9] McKay WB, Sweatman WM, Field-Fote EC. The experience of spasticity after spinal cord injury: perceived characteristics and impact on daily life. Spinal Cord 2018;56(5):478–86.

[10] Cruz-Montecinos C, Núñez-Cortés R, Bruna-Melo T, Tapia C, Becerra P, Pavez N, Pérez-Alenda S. Dry needling technique decreases spasticity and improves general functioning in incomplete spinal cord injury: A case report. J Spinal Cord Med. 2020 May;43(3):414-418.