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THE ADDITIONAL EFFECT OF PROPRIOCEPTION TRAINING ON PAIN AND NECK DISABILITY INDEX SCORE IN YOUNG ADULTS WITH CHRONIC TRAPEZIUS SPASM.

Physiotherapy

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ABSTRACT

Aim of study: To compare the additional effect of proprioception training vs conventional therapy on pain and neck disability index scores in young adults with chronic trapezius spasm. **Material and Method:** 20 subjects were assigned into two groups, Group 1 Conventional + Proprioception training and Group 2 Conventional therapy. Outcomes measures used were Numerical Pain Rating Scale and Neck Disability Index Scale. **Result:** There was a significant reduction in pain and improvement of NDI score in both groups 1 and 2. **Conclusion:** Both the interventions were effective in reducing pain and improving NDI Score. However, when both interventions were compared for pain and improvement in NDI score, both were equally effective.

KEYWORDS

trapezius spasm, proprioception training, NDI, NRS, conventional therapy

INTRODUCTION

Two out of every three people in the general population will have neck pain at some point in their lives, and the majority of these neck problems are caused by non-specific causes.[6] The upper trapezius muscle has been discovered to be the most affected in neck pain, and there is a strong link between neck/shoulder pain intensity and trapezius muscle tenderness.[7]

The trapezius muscle is an inverted triangle that begins at the base of the head and extends over the shoulders and into the mid back.[8] Trapezius spasm is frequently attributed to poor posture. Muscular spasms, discomfort, or pain can be caused by keeping poor posture for long periods of time, according to research. Spasms can be caused by watching television or working on a computer with an incorrect posture, or even by using a thick pillow.[2] It causes cervical spine range of motion restrictions, discomfort, and neck pain[3],[5] which in turn reduces the neck's functioning capacity.

Trapezius spasm is commonly treated in a variety of ways. Heat therapy, US, TENs stretching, SSF, Postural correction, mfr, and met are all included [8], [12].Heat therapy has a number of therapeutic effects, including pain alleviation, enhanced blood flow and metabolism, and enhanced connective tissue elasticity. [13] Stretching is commonly recommended for the treatment of trapezitis and other neck ailments since it helps to alleviate muscle spasm.[14]

Afferent information emerging from regions of the body that aids in postural control, joint stability, and awareness is known as proprioception.[9] Maintaining proprioceptive integration in the neuromuscular control of posture is thought to be critical for pain-free involvement in daily activities.[10] Patients with trapezitis who have severe trapezius spasm have been found to have poor proprioception. [11]

So, in addition to conventional therapy of hot packs, stretching, cervical ROM exercises; proprioception training will be used in this study to see if correcting defective proprioception impacts pain perception and the neck disability index score in patients with persistent trapezius spasm (>3 months). This will help the therapist in better clinical decision making.

METHODOLOGY

A comparative study with an experimental study design was conducted among 20 female [22] students at K. J. Somaiya College of Physiotherapy over a period of 6 months. Females aged 18 – 25 years with chronic trapezius spasm (duration more than 3 months), Numerical Pain Rating Scale score from 4 to 7 (including 4 and 7).

Subjects with history of cervical spine, shoulder injury, cervical degenerative conditions, referred pain due to cervical pathology, malignancy and fractures were excluded. Then the subjects were randomly divided into two groups using a computer generated randomized sampling method.

PROCEDURE

Study was started after taking permission from the Institutional Review Board to conduct study in the premises.The subjects were explained about the study procedure and a written consent was taken from them. They were then randomly divided into two groups – **Experimental group (**Group 1) and **Control group (**Group 2) using a computer generated randomized sampling method. Following the division into groups, Numeric Pain Rating Sale and their Neck disability index score was recorded at the start and at the end of the study.

1) Numerical Pain Rating Scale

The pain intensity will be measured using the Numeric Pain Rating Scale (NPRS). The participants will be presented an 11-pointer scale ranging from 0 (no pain) to 10 (worst pain imaginable). They will then be asked to place their pointer on the number that best describes their level of experienced pain.[20]

2) Neck Disability Index

This questionnaire provides information on how neck pain has impacted a person's capacity to function in daily life. There are a total of ten components. The total score for each component is 5: if the first statement is marked, the section score is 0, and if the last statement is marked, the section score is 5.[21]

After the assessment was done, the subjects of Group 1 were given conventional therapy and additional proprioception training and the subjects of Group 2 were given only conventional therapy.

Experimental group (Group 1) was treated with conventional therapy and additional proprioception training for 5 sessions per week for 2 weeks. Conventional therapy included Hot pack application for 10 minutes, Trapezius stretching- 30 seconds each for 3 sets, Cervical ROM exercises- 10 times for 2 sets.Proprioception Training[17]- Coordination training:Gaze stability (eyes still, head moves into flexion,extension and rotation)- 10 times for 2 sets.Muscle performance training- Head-lifts into flexion,extension,lateral flexion- 10 times for 2 sets.Balance- Tandem walk, walking with head movement (eyes still, head moves into flexion, extension and rotation)- 10 times for 2 sets. Control group (Group 2) was treated with conventional therapy for 5 sessions per week for 2 weeks. Conventional therapy:Hot pack application- 10 minutes, Trapezius stretching- 30 seconds each for 3 sets, Cervical ROM exercises- 10 times for 2 sets.

STATISTICALANALYSIS

The data was analysed using Graph Pad Instat software version 3.10.Within the groups- Paired t test was performed for data passing normality and Wilcoxon signed- rank test for data not passing normality. Between the groups- Unpaired t test was performed for data passing normality and Mann Whitney test for data not passing normality.

RESULT

A total of 20 female undergraduate students participated in this study with the mean age of 22.45 years.

Table 1. Comparison of outcome measures NPRS and NDI scores within the same group (Control Group A)

Outcome Measure		Pre Score	Post Score	P value	Interpretation
NPRS	Mean	5.95	3.8	0.0002	Significant
	S.D.	1.21	1.317		
NDI	Mean	20.21	12.96	0.0023	Significant
	S.D.	10.09	8.601		

Table 2. Comparison of outcome measures NPRS and NDI scores within the same group (Experimental Group B)

Outcome Measure		Pre Score	Post Score	P value	Interpretation
NPRS	Mean	5.3	3.6	0.0011	Significant
	S.D.	1.08	1.35		
NDI	Mean	20.9	14.9	0.0001	Significant
	S.D.	10.56	11.01		

Table 3. Comparison of outcome measures NPRS and NDI scores between group A and B

Outcome Measure		Pre Score	Post Score	P value	Interpretation
NPRS	Mean	1.7	2.15	0.3913	Not Significant
	S.D.	1.135	1.156		
NDI	Mean	6	7.3	0.4994	Not Significant
	S.D.	2.44	5.43		

DISCUSSION

The purpose of this study was to compare the additional effect of proprioception training vs conventional therapy on pain and neck disability index scores in young adults with chronic trapezius spasm. The study was conducted among 20 young female adults between the age group of 18-25 years of age (Mean 22±1), who had trapezius spasm for a period of more than 3 months (chronic). The subjects were randomly divided into two groups - 1) Experimental Group receiving conventional therapy and proprioception training, 2) Control Group who received only conventional therapy. NPRS for pain and NDI Score were used to evaluate pre-post effects of the intervention given.

In the Control group, it was observed that there was significant reduction in pain ($p< 0.0011$) and improvement in NDI Score ($p< 0.0001$) where participants were treated with only conventional therapy which included stretching, cervical ROM exercises and hot packs. Stretching relieves pain by promoting the inhibitory effects of the golgi tendon organs, which diminish motor neuronal discharges. This allows the musculotendinous unit to relax by resetting its resting length and modifying the pacinian corpuscle. These reflexes will enable musculotendinous unit tension to be reduced and thus pain to decrease.[24] A study done by Bedekar Nilima et al [24] concluded that trapezius stretching is effective in relieving the pain. The study conducted by Dr Diptee Waingankar et al in unilateral trapezitis patients has also demonstrated reduction in pain using Visual analog scale.[15] Heat therapy also increased blood flow to the specific area causing physiological and clinical changes leading to reduced muscular spasms, pain relief, increase in healing and washing of metabolites. [25].

It was observed that there was significant reduction in pain ($p< 0.0002$) and improvement in NDI Score ($p < 0.0023$) among Experimental Group participants treated with conventional therapy and proprioception training. This can be credited to the above mentioned mechanisms of hot packs and stretching which led to decrease in pain and improvement in neck function. Along with that, according to a study conducted by Michael A McCaskey, Corina Schuster-Amft et al, Reduced proprioception causes decreased afferent activity from receptors, which leads to faulty dynamic movement regulation and abnormal muscle activity. As a result, muscle activation becomes unbalanced, resulting in poor posture and pain.[1] Hence, in addition to the benefits of conventional therapy, proprioception correction helps in the reversal of this cycle and, as a result, indirectly contributes in the reduction of pain.

When inter group comparison was done it was found that both groups were equally effective in relieving pain ($p= 0.3913$, insignificant) and improving neck functions ($p=0.4994$ insignificant). This is because of the proven effects of hot packs and stretching in the reduction of pain and improvement of functional capacity of the neck.[15], [24], [25], [26].When compared to conventional therapy, the addition of proprioception training did not provide any greater benefit. A review conducted by McCaskey MA1, Schuster-Amft C, et al assessed the effects of proprioceptive exercises on pain and function in chronic neck- and low back pain rehabilitation. Even their findings revealed that the role of proprioception training in rehabilitation and improved function is inconsistent and the reasons are multifactorial from no standardised procedure of PrT to no objective outcomes to measure pain.[1] To fully comprehend the addition of proprioception training effects on pain and NDI score improvement, the study should should be conducted for a longer duration of time with bigger sample size.

CONCLUSIONS

The results of the study suggested that there was a significant reduction in pain and improvement in NDI score with both additional proprioceptive training with conventional therapy and only conventional therapy.However, when both the interventions were compared, the study concluded that additional proprioceptive training with conventional therapy and only conventional therapy is equally effective in reducing pain and improving NDI score in young adults with chronic trapezius spasm.

CLINICAL IMPLICATIONS

Both the interventions given are clinically beneficial in reducing pain and improving NDI score, and can be used in the management of patients with upper trapezius spasm.

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