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## Effectiveness of elastic resistance band exercises versus conventional exercises on cases of trapezitis: A comparative study

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### Abstract

**Aim:** To find out the Effectiveness of Elastic Resistance Band Exercises Versus Conventional Exercises on Cases of Trapezitis.

**Methodology:** All the subjects will be explained about the purpose and the procedures of the study & written informed consent will be obtained from all participants.

**Result:** Significant Results were obtained.

**Conclusion:** This study is believed to draw attention to the importance of exercises in Trapezitis and to contribute to formation of clinical guidelines in the future and further researches on similar protocols with varied parameters.

**Keywords:** Elastic resistance, band exercises, versus conventional exercises

### Introduction

Trapezitis is defined as inflammation of trapezius muscle. The upper trapezius muscle is designated as postural muscle and it is highly susceptible to overuse<sup>[1]</sup>. The pain is present even during rest and is aggravated by activity; it may be referred to other area from the site of primary inflammation. Passive range of motion may be painful and restricted due to pain and protective spasm in antagonist Groups of muscles<sup>[2]</sup>. Trapezitis is an inflammatory pain arising from the trapezius muscle causing a severe neck spasm. This muscle lies at the back of the neck and help in shrugging movement of the shoulders along with upward movement of the head<sup>[3]</sup>. Trapezitis is an inflammation of trapezius muscle which involve myofascial pain syndrome, that can be commonly encountered in clinical practise<sup>4</sup>. Trapezitis pain occurs for when person does neck extension, it is occurred due to faulty posture during walking, watching time, prolonged use of phone<sup>[3]</sup>.

Neck pain is very common in the region of the upper trapezius muscle. About two thirds of people experience neck pain at some points in their lives. In middle age prevalence is highest and women are more affected than men. Neck pain prevalence varies widely on different studies with a mean point prevalence of 13% (range 5.9%-38.7%) and mean lifetime prevalence of 50% (range 14.2% - 71.0%)<sup>[5]</sup>. Poor ergonomic work habit such as prolonged constrained work position with ley neck or spine flexion may imply a risk factor<sup>[6]</sup>. Maintaining poor posture for long periods of time can result in chronic muscular fatigue, discomfort or pain, even if the soft tissues are not structurally altered<sup>7</sup>, more significantly prolonged exposure to high static muscle and joint may lead to pathological effects and permanent disability.

Exercises has proved to be very important for neck pain. These exercises strengthen the muscle, help in increasing the range of motion, and improve mobility thus reducing the chance of recurrence of Trapezitis<sup>[8]</sup>. Neck isometric exercises cause contraction and relaxation of the neck muscles thus massaging all the toxins, which are responsible for causing inflammation. Also the muscle fibers are strengthened due to the same<sup>[9]</sup>. Neck muscle exercises if given thus will prove to be beneficial in improving stability of the neck muscle<sup>[10-11]</sup>.

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## Subjects and Methods

Purposeful selection for Trapezitis cases was done. 70 subjects which included both male and female, with age group between 20-50 years were selected for the study. Out of which only 60 subjects could meet the inclusion and exclusion criteria as listed. Out of 60 subjects, 50 subjects could effectively participate and completed the full study procedure.

These 50 subjects were randomly allocated into two Groups (Group A and B).

Summary for Procedure of both the Groups

Group A	Group B
1. Therapeutic ultrasound frequency- 3Mhz Mode- continuous Intensity- 0.1-1.5w/cm <sup>2</sup> Duration- 5mins Position- back rest 2. Elastic resistance band exercises -Shrugs -Lateral raise ---Back pull down -Upright row 1 set of 10 repetitions with hold of 10 sec in each repetition. Position – standing	1. Therapeutic ultrasound frequency- 3Mhz Mode- continuous Intensity- 0.1-1.5w/cm <sup>2</sup> Duration- 5mins Position- back rest 2. Conventional Exercises Passive stretching Hold- 5sec .Static neck exercises Hold- 10sec Rest- 5 sec .Strengthening exercises -shoulder shrug -scapular retraction 1 set of 10 repetitions Position- sitting

## Discussion

Current study was conducted to compare the effects of elastic resistance band exercises with conventional exercises on Trapezitis along with US therapy. The study was conducted on 50 subjects with the age Group of 20-50. According to the inclusion criteria and was randomly divided into two Groups i.e. Group-A and Group-B based on sampling method. Subjects of Group-A were treated with elastic resistance band exercises and Group-B with conventional exercises and both the Groups were given US therapy as a common mode of physiotherapy regime. Elastic resistance band exercises used in present study have shown improvement in subjects. Lars Andersen *et al.* (2010) investigate muscle activation in perceived loading during upper extremity resistance exercises with dumbbells versus elastic resistance bands proved that high-level of muscle activation were obtained during both the Interventions and stated that therapists can choose either type in clinical practice this supports the use of elastic bands in our study.

In current study Elastic resistance band exercises with US therapy shows reduction in pain and functional limitation at post-intervention stage as compared to pre-intervention stage which indicated the effectiveness of elastic resistance band exercises ( $p=0.000$ ). Conventional exercises used in present study have shown improvement in subjects as they neurologically inhibit pain or involuntary muscle contraction long enough to allow movement past the barrier with isometric neck contraction, there is a stimulation of muscle proprioceptors which may produce pain relief according to the pain gate theory where in the mechanoreceptor afferents carried by the large diameter axon inhibits nociceptor afferents at the dorsal horn of spinal cord. The conventional exercises along with US therapy had also reported relief in pain and functional limitation at post intervention stages as compared to pre-intervention stage ( $p= 0.000$ ). At baseline, Group A and Group B approximately similar in VAS score ( $p=0.125$ ) and NDI score ( $p=0.498$ ) whereas at post-intervention stage, the VAS score ( $p=0.103$ ) and NDI score ( $p=0.513$ ) for both the groups shows non-significant difference between them. After comparison, the result

indicates that elastic resistance band exercises found to be equally effective physiotherapeutic regime in improving VAS and NDI score in patients with Trapezitis as compared to conventional exercises.

Kannan P state an article on Myofascial trigger points using different treatment modalities used continuous mode of therapeutic ultrasound for 5 mins 0.1-1.5 watts/cm<sup>2</sup> supports the treatment parameters of ultrasound used in the present study. It concluded stating that continuous mode of ultrasound was effective in treating subjects having myofascial trigger points. But this article was contradicted by another article which was given by Abramson D. I. *et al* proved that pulsed ultrasound is effective to treat patient with trapezius myalgia as compared to the continuous mode of therapeutic ultrasound. In the present study we have used continuous mode of ultrasound for 5mins 0.1 -1.5 watts/cm<sup>2</sup> in treatment of Trapezitis and found that it was beneficial for the subjects who had Trapezitis. The improvements in the both Groups could also be due to the effect of passive stretching. The concept behind the stretching of Trapezius is that the affected muscle is set in the lengthened position in order to activate autogenic inhibition reflex and to improve the viscoelastic property of the muscle and surrounding tissue. Cunha *et al* found that conventional stretching and muscle chain stretching in association with manual therapy were equally effective in reducing pain and improving the range of motion and quality of life of female patients with chronic neck pain, both immediately after treatment and at a six-week follow-up. In the present study we have used VAS and Neck Disability Index as the outcome measures and have found clinical significance with the same and hence both the treatment interventions are effective in treatment of Trapezitis and none of the treatment intervention is superior to the other. Carvalho S *et al* done research to evaluate the effectiveness of positional release technique on Trapezitis had used the same outcome measures as used in our study and found statistically significant difference in pre and post intervention.

Based on the statistical analysis, both Group A and B showed a drastic improvement in VAS and NDI it has also shown significant improvement clinically in reduction of pain and

functional limitation. Consequently both the Groups showed ample improvement over baseline data. However subjects in Group-B( $5.92 \pm 27.83$ ) who received conventional exercises and US therapy showed better improvement than the subjects in Group-A( $4.52 \pm 24.64$ ) who received elastic resistance

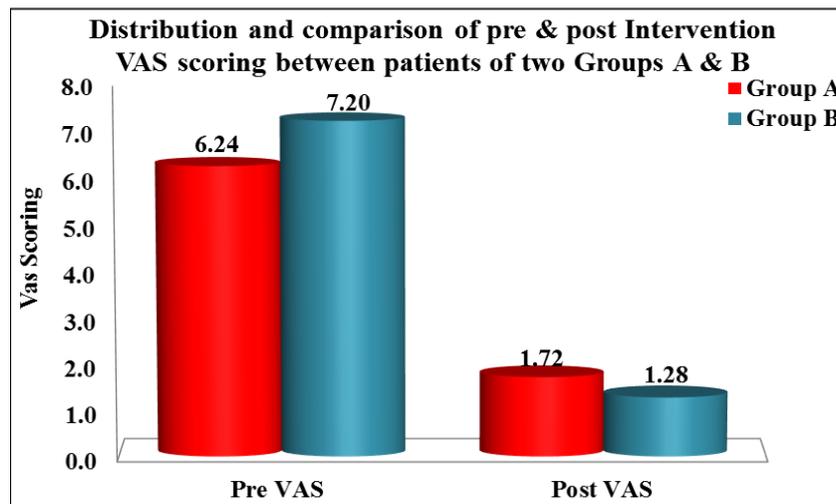
band exercises and US when both the Groups were compared at the end.

**Results**

**Table 1:** Measurement of changes in VAS score from (Baseline) Pre to Post Intervention in Group A and Group B

Group	Sampling Stage	Score on VAS	Mean Diff	t-statistic	p-value (LOS)
		Mean $\pm$ SD			
Group A	Pre-intervention	6.24 $\pm$ 1.99	4.52 points	17.90	p=0.000 <sup>#</sup>
	Post- intervention	1.72 $\pm$ 1.02			
Group B	Pre-intervention	7.20 $\pm$ 2.35	5.92 points	16.65	p=0.000 <sup>#</sup>
	Post- intervention	1.28 $\pm$ 0.84			

<sup>#</sup> The mean differences are highly significant at the 0.000 level of significance. The degrees of freedom are 24. [Mean Diff-Mean Difference; LOS-Level of Significance]

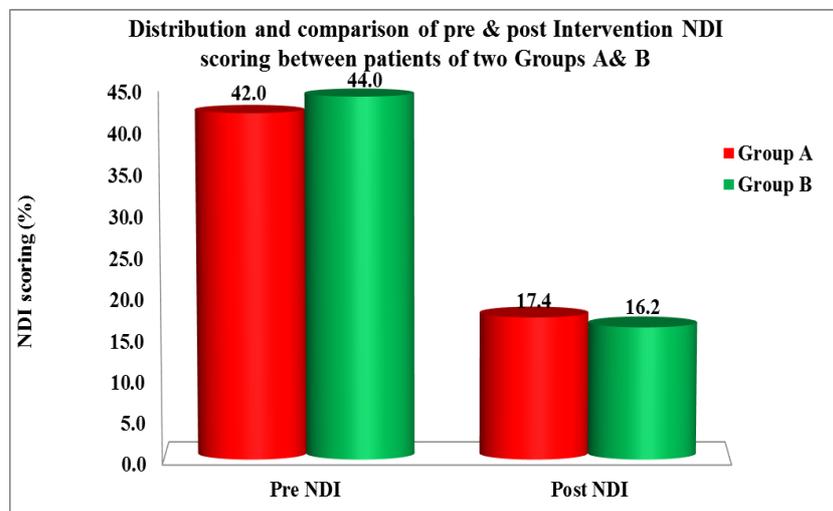


**Fig 1:** Bar diagram is showing the distribution and comparison of pre-and post-interventions scoring of pain, of patients with Trapezitis of Group A and Group B.

**Table 2:** Measurement of changes from (Baseline) Pre to Post Intervention scores noted on NDI in Group A and Group B.

Group	Sampling Stage	Score on NDI	Mean Diff	t-statistic	p-value (LOS)
		Mean $\pm$ SD			
Group A (%)	Pre-intervention	42.01 $\pm$ 10.44	24.64%	24.20	p=0.000 <sup>#</sup>
	Post- intervention	17.37 $\pm$ 6.41			
Group B (%)	Pre-intervention	43.99 $\pm$ 10.10	27.83%	22.36	p=0.000 <sup>#</sup>
	Post- intervention	16.16 $\pm$ 6.62			

<sup>#</sup> The mean differences are highly significant at the 0.000 level of significance. The degrees of freedom are 24. [Mean Diff-Mean Difference; LOS-Level of Significance]

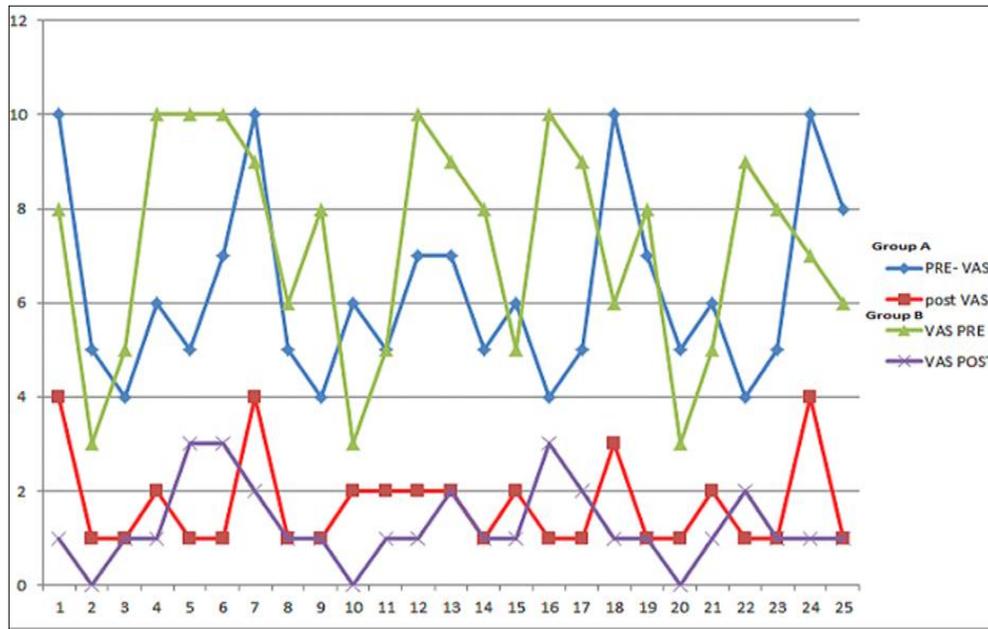


**Fig 2:** Bar diagram is showing the distribution and comparison of pre-and post-intervention scoring of NDI of patients with Trapezitis of Group A and Group B.

**Table 3:** Assessment of changes in VAS score between Group A and Group B at Pre and Post Interventions

Stage of Sampling	Group	Score on VAS	Mean Diff	t-statistic	p-value (LOS)
		Mean ± SD			
Pre Intervention	Group A	6.24±1.99	0.96 points	1.56	p=0.125 <sup>⊗</sup>
	Group B	7.20±2.35			
Post Intervention	Group A	1.72±1.02	0.44 points	1.66	p=0.103 <sup>⊗</sup>
	Group B	1.28±0.84			

⊗ The mean difference is not significant (insignificant) at the 0.05 level of significance. [Mean Diff-Mean Difference; LOS-Level of Significance]

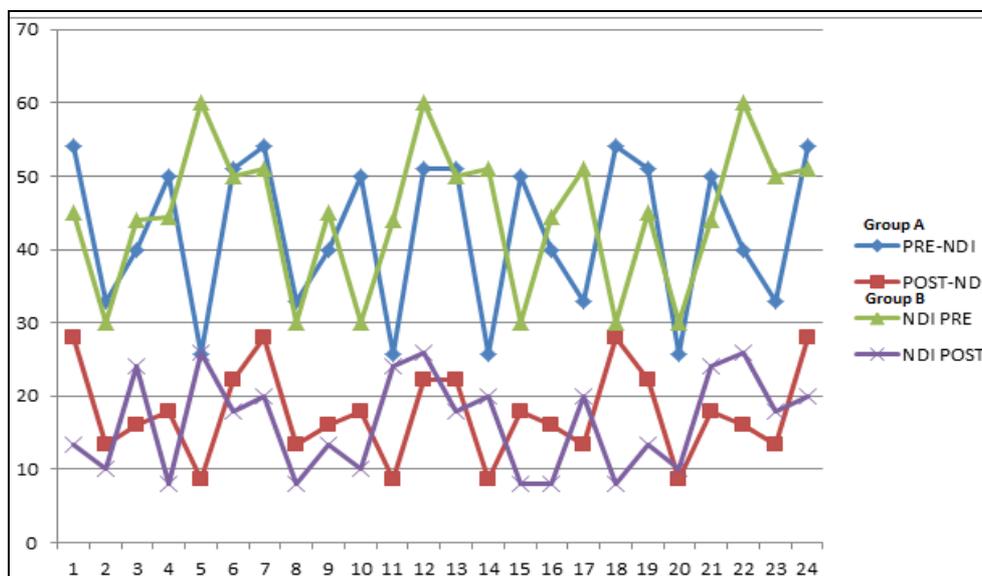


**Fig 3:** Line diagram is showing the distribution and comparison of pre-and post-intervention pain of patients with Trapezitis of Group A and Group B.

**Table 4:** Comparison of scores between Group A and Group B noted on NDI at Pre (baseline) and Post Interventions

Sampling Stage	Group	Score on NDI	Mean Diff	t-statistic	p-value (LOS)
		Mean ± SD			
Baseline (%)	Group A	42.01±10.44	1.60%	0.68	p=0.498 <sup>⊗</sup>
	Group B	43.99±10.10			
Post intervention (%)	Group A	17.37±6.41	1.21%	0.66	p=0.513 <sup>⊗</sup>
	Group B	16.16±6.62			

⊗ The mean difference is not significant (insignificant) at the 0.05 level of significance. [Mean Diff-Mean Difference; LOS-Level of Significance]



**Fig 4:** Line diagram is showing the distribution and comparison of pre-and post-intervention neck disability index of patient with Trapezitis of Group A and Group B.

## Conclusion

The present study concluded that both the treatment interventions that is elastic resistance band exercises and conventional exercises along with therapeutic ultrasound have proved to be effective in reducing pain and reducing neck disability in subjects with Trapezitis. This study is believed to draw attention to the importance of exercises in Trapezitis and to contribute to formation of clinical guidelines in the future and further researches on similar protocols with varied parameters as context.

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