



## Immediate Effect of Spray and Stretch Technique on Trapezitis: An Experimental Study

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### ABSTRACT

**Background:** Inflammation of upper trapezius muscle is known as trapezitis. It leads to myofascial trigger point and muscle spasm. It causes range of motion restriction of cervical spine, tenderness and neck pain. Many clinicians have widely used spray and stretch technique in treating myofascial trigger point, musculoskeletal dysfunction and increases range of motion of various joints in conditions like tendinopathy, epicondylitis, active and passive hip flexion and concluded to be effective treatment.

**Aim:** To analyse the immediate of spray and stretch technique on acute trapezitis.

**Method and Materials:** Primary data collection was done from various institutes in Belagavi using convenience sampling method, 30 subjects affected with trapezitis, between the age group of 18-30 years were included using inclusion criteria and subjects were assessed before and after the treatment with outcome measures that were cervical range of motion and pressure algometer.

**Results:** The results suggested that cervical range of motion and pressure algometer both were significant.

**Conclusion:** The present study provided evidence to prove that spray and stretch technique is effective in terms to increases range of motion and increase pain pressure threshold on acute trapezitis.

**Keyword:** Trapezitis, myofascial trigger point, Diclofenac spray, pain pressure threshold, upper trapezius stretch.

### Introduction

Trapezius muscle undergoes inflammation that causes trapezitis with severe neck pain. Trapezitis pain occurs for when person does neck extension, it is occurred due to faulty posture during working, watching time, prolonged use of phone. The trapezius muscle lies at neck and back area. This muscle helps in shrugging of shoulder and during neck movements<sup>1</sup>.

Prevalence is highest in females with middle age are affected more than males. The prevalence of neck pain is varying with mean point prevalence of 13% and neck pain occurs commonly in upper

trapezius muscle. Muscle spasm occurs immediately after injury, if the injury is not treated it leads to trigger point<sup>2</sup>.

Trapezitis condition is subdivided as acute, sub-acute and chronic based on period of time it occurs acute occurs for less than one month, sub-acute condition lasts for 1-3 month and chronic is present for 3 or more than 3 months<sup>3</sup>.

Trigger point is focal tenderness present in palpable taut band, which causes referred pain in skeletal muscle. The pain pressure threshold is elicited by using pressure algometer and trigger point sensitivity is measured<sup>2</sup>. It measures the

minimum applied force on muscle that induces discomfort or pain. Force of it is measured within the range from 0 to 10 kg with 0.1 kg resolution. A hold button is used for force reading. It is handheld device that has a force gauge fitted with rubber tip. Pressure algometer is highly reliable and valid.<sup>4</sup>. Trigger point increases metabolism and decreases blood circulation, it is caused due to repetitive microtrauma or acute trauma<sup>5</sup>.

To assess the decreased range of motion in trapezitis, cervical range of motion was evaluated. Cervical range of motion is joint moves from an anatomical position to extreme limit of its motion in a particular direction, in range of motion of joint. It is measured in degree<sup>2</sup>. Universal goniometer is highly reliable and valid when compared to any other mean to measure active cervical movement<sup>6</sup>.

Various manual therapies are used for treatment of trapezitis with trigger are stretching, ischemic compression, transverse friction massage, positional release technique<sup>7</sup>.

Spray and stretch technique is a non- invasive technique, first described by Hans Kraus. The technique decreases the pain sensation, relieves muscle spasm and referred pain<sup>8</sup>. Topical Diclofenac is used to treat pain and inflammation; it further penetrates inflamed tissue to exert anti-inflammatory activity<sup>9</sup>.

## Material and Material

### Institutional Review Board Approval

Ethical clearance was obtained from the Institute of Ethical Board and was conducted in conformity with ethical and human principles of research.

### Participants

30 participants were included in study from various institutes in Belagavi, for 3 month. The inclusion criteria were 1. Adults male and female between the age group of 18-30 years, 2. Subjects diagnosed with acute trapezitis, 3. Subjects with trigger point, 4. Participants willing to participate. The exclusion criteria were 1. Traumatic neck injury, 2.Cervical spinal cord compression,

3.cervical radiculopathy, 4.Spondylolisthesis of cervical spine.

### Procedure

Participants with trapezitis were screened for their eligibility depending on inclusion and exclusion criteria. Participants were requested to participate in study after screening was done. They were explained the procedure and written informed consent was given. Demographic data including age, gender, hand dominance, affected side and occupation was obtained. Then cervical range of motion and pressure algometer was assessed before and after the treatment. Spray and stretch technique was given to the participants.

### Results

The present study titled “THE IMMEDIATE EFFECT OF SPRAY AND STRETCH TECHNIQUE ON ACUTE TRAPEZITIS” included 30 participants, who received spray and stretch technique. They were examined based on outcome measures, cervical range of motion and pressure algometer.

### Statistical Analysis

Statistical analysis for the present study was done manually as well as using statistical package of social sciences (SPSS) version 21 so as to verify the results obtained .For this purpose data was entered into an excel spread sheet, tabulated and subjected to statistical analysis . Various statistical measures such as mean, standard deviation, and test of significance such as paired t –test were used. Nominal data from patient’s demographic data i.e. the age with respect to the duration of symptoms distribution were analyzed using t-test. Comparison of the pre intervention and post intervention outcome measures that is cervical range of motion and pressure algometer within the group was done by using Paired t-test, was utilized to measure the difference between two groups (Intergroup comparison). Probability values less than 0.05 were considered statistically

significant and probability values less than 0.001 were considered highly significant.

Total numbers of male participants were 5 while female participants were 25. The participants in study who those were less than 20 years of age were 7 and more than 21 years of age were 23 with mean of age 21.67. The means age of

participants was  $21.67 \pm 1.84$ . Table 1 shows statistically significant all range of motion of cervical spine with p value less than 0.05 ( $p = 0.0001$ ). Table 2 show right and left pressure algometer measurement is statistically significant with p value less than 0.05 ( $p = 0.0001$ ;  $p = 0.0005$ ).

**Table 1**

CROM	Test	Mean $\pm$ Std.Dv	Mean Diff. $\pm$ SD Diff.	% of change	Paired t	p-value
Flexion	Pretest	54.43 $\pm$ 7.51	-5.63 $\pm$ 5.27	-10.35	-5.8565	0.0001*
	Posttest	60.07 $\pm$ 9.18				
Extension	Pretest	48.20 $\pm$ 13.95	-13.63 $\pm$ 10.54	-28.28	-7.0833	0.0001*
	Posttest	61.83 $\pm$ 13.00				
Lt. Lateral Flexion	Pretest	54.90 $\pm$ 15.26	-10.30 $\pm$ 8.28	-18.76	-6.8133	0.0001*
	Posttest	65.20 $\pm$ 12.47				
Rt. Lateral Flexion	Pretest	50.83 $\pm$ 12.45	-11.23 $\pm$ 7.99	-22.10	-7.6964	0.0001*
	Posttest	62.07 $\pm$ 11.84				
Lt. Rotation	Pretest	61.43 $\pm$ 11.17	-9.67 $\pm$ 7.62	-15.74	-6.9508	0.0001*
	Posttest	71.10 $\pm$ 11.80				
Rt. Rotation	Pretest	61.80 $\pm$ 14.54	-11.97 $\pm$ 9.19	-19.36	-7.1296	0.0001*
	Posttest	73.77 $\pm$ 11.06				

\*p<0.05

**Table 2:**

	Test	Mean $\pm$ Std.Dv.	Mean Diff. $\pm$ SD Diff.	% of change	Paired t	p-value
Right	Pretest	2.26 $\pm$ 0.91	-0.21 $\pm$ 0.30	-9.44	-3.9216	0.0005*
	Posttest	2.47 $\pm$ 0.90				
Left	Pretest	2.19 $\pm$ 0.62	-0.20 $\pm$ 0.18	-9.10	-5.9601	0.0001*
	Posttest	2.39 $\pm$ 0.66				

\*p<0.05

**Discussion**

The present experimental study was aimed to analyze the immediate effect of spray and stretch technique on subjects with acute trapezitis. The outcome measures used in this study were cervical range of motion and pressure algometer. The results of study showed that treatment was effective in increasing pain pressure threshold and cervical range of motion.

Recent studies established that trapezitis is condition which is seen in adulthood that occurs because of neck spasm, that is painful and discomforting stiffness of neck muscles. Trapezitis can be of three stages according to the reference of time that is acute, sub-acute and chronic. Due to overuse of muscle, stress and faulty posture during work-time leads to

myofascial pain. The symptoms include muscle spasm, movements are limited, tenderness, stiffness and it constitutes large group of muscles disorder with trigger point<sup>3</sup>.

In the present study, the age group included was 18-30 years. The mean age of participants in the study was 21.67. Another, study was done by siniluck kanchanomai et.al, in which he included age group between 18- 25 years and concluded that the prevalence of musculoskeletal symptoms in neck among the undergraduate’s students was 48- 78% while the neck pain was increased among undergraduates in second year as compared to first year due to stress. Now further it can be co-related with study done by cote Pierre et.al, in which incidence and prevalence of neck pain in healthy population suggested that neck pain is

common in person with below 35 years of age. Thus in the present study, it concluded that trapezitis is common in age group of 18- 30 years which can be because of muscle imbalance and poor posture.

Another literatures, mentioned that females are more commonly affected with trapezitis than male. But still the gender distribution for incidence of trapezitis in male and female is controversial<sup>10</sup>. The present study conducted has 5 males and 25 females affected with acute trapezitis. It is statistically been proved that males and females are not equally affected with trapezitis. Some studies are present which also showed that male and females are equally affected with trapezitis. Reason behind females more commonly affected with trapezitis than male can be due to stress and literatures are present on females are more stressed<sup>11</sup>.

In this study, the outcome measure taken was cervical range of motion using universal goniometer. Studies have concluded that restriction of movement is one of the symptoms that occur due to trapezitis. Even some researchers have found that trapezitis causes trigger point that also causes referral pain to neck and head that further leads to decrease in the neck movements<sup>3</sup>. Study done on different measurement instruments for testing the validity and reliability for active cervical range of motion i.e., flexion, extension, rotation, and side bending, they found that goniometer is great to use for practical purpose. Study was conducted to show effect of positional release technique in subjects with sub-acute trapezitis including outcome measure as visual analogue scale, cervical range of motion and neck disability index and showed that there was increase in all range of motion of cervical spine<sup>11</sup>. In the present study, the range of motion of cervical spine was increased. It can be because of trigger point pain was decreased and due to muscle spasm was must have released.

Researchers suggest that pressure algometer can be used for clinical and research purpose. It measures pain threshold which is a unique method

that cannot be obtained from any other method. Pressure algometer was used in studies to measure the depth of trigger point during and after the treatment. Pressure algometer implies pressure tolerance testing for trigger point. Study was conducted for reliability and validity of pressure algometer using force- plate it concluded that the pressure algometer is highly reliable and valid for testing for pain threshold<sup>4</sup>.

Myofascial pain in upper trapezius occurs because of poor posture, acute trauma, muscle stress and psychological stress with complaints of neck pain, headache, muscle stiffness, restricted range of motion of cervical spine. Trapezitis is a musculoskeletal condition that causes a hyperirritable spot within the taut band of skeletal muscle, trapezitis is further precipitate by modern computerized world which consists prolonged cell phone speaking on phones with neck in flexion, prolonged driving, prolong use of laptop. There are various manual and mechanical therapies used for trapezitis and release of myofascial trigger point.

Studies have founded that transcutaneous electrical nerve stimulation with stretching and also using myofascial release technique which is effective in treating the patient with trapezitis<sup>12</sup>.

In the presented study, technique used to treat participants with trapezitis was spray and stretch technique. There are recent studies were it was founded that spray and stretch technique does not show significant increase in pain pressure threshold after the treatment<sup>13</sup>. Archives of physical medicine and rehabilitation<sup>3</sup> Studies have proved that in acute or chronic musculoskeletal condition topical diclofenac is well tolerated<sup>14</sup>. As the muscle spindle is sensitive to stretch reflex, there when the topical diclofenac is applied it decreases synthesis of proinflammatory prostaglandins by inhibiting the COX isoenzyme and reduces the inflammation this leads to anesthetic effect on nociceptive afferent fibers<sup>15</sup>. During this anesthetic effect the purposeful lengthening of muscle occurs after the muscle stretch is applied<sup>16</sup>. Thus, to prevent hardening of

blood arteries and increase blood flow it is important to stretch muscle<sup>17</sup>. When muscle is given stretch the thin filament are pulled away from thick filament and literatures have found that titin filament present in myofibrils increases the tension within the muscle. Studies have showed effect of stretching for 15-60 seconds with increase in flexibility of the muscle but further it was also been concluded that the muscle return to its pre-stretched position within 10-20 minutes<sup>16</sup>. Evidences are based that strongly show that topical and ibuprofen in the treatment of acute soft tissue injury<sup>18</sup>. In the present study we analysed that the immediate effect of spray and stretch technique was statistically significant associated with increased range of motion of cervical spine, increase in pain pressure threshold.

### Conclusion

The present study provided evidence to prove that spray and stretch technique is effective in terms to increases range of motion and increase pain pressure threshold on acute trapezitis.

### Future Scope of the Study

A prospective study with regular follow-up can be taken up to evaluate the long term effects of the specified study.

Study can be done taking large sample size with different age group.

Study can be conducted in a different geographical area.

Study can be compare with other technique.

**Conflicts of Interest:** None

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