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EFFECTIVENESS OF INTEGRATED NEUROMUSCULAR INHIBITORY TECHNIQUE (INIT) WITH SPECIFIC STRENGTH TRAINING EXERCISES IN SUBJECTS WITH UPPER TRAPEZIUS TRIGGER POINTS

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ABSTRACT

Background: Upper trapezius trigger points is a common cause for neck pain, decreased cervical range of motion and functional activities. The purpose of the study was to evaluate the effectiveness of integrated neuromuscular inhibitory technique (INIT) along with specific strength training exercises in reducing pain, improving ROM and functional activities in subjects with upper trapezius trigger point.

Methods: Thirty subjects were diagnosed with upper trapezius trigger points were included in the study. These patients were randomly allocated to intervention group (n=15), which underwent a 4-weeks training program of INIT along with specific strength training & control group (n=15) that received INIT alone. The outcome measures were taken before and after treatment. Outcomes were measured by visual analogue scale, cervical range of motion and neck disability index. Within the groups VAS, NDI, and cervical lateral flexion and rotation showed significant change in the mean value. The comparison of pre and post VAS in experimental group and control group showed a significant change in the experimental group. Paired sample t- test was used to analyze changes from before and after intervention programmed.

Results: There is a statistically significant ($p < 0.00$) improvement in both variables from baseline to 4th week in experimental group and control group but compared to control group, experimental group shows highly significant values in all parameters.

Conclusion: INIT along with specific strength training is proved to be effective in reducing pain, decreasing disability and improving range of motion in individuals with upper trapezius trigger points.

Keywords: Myofascial pain, trigger point, INIT (integrated neuromuscular inhibitory technique), MET.

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INTRODUCTION

Neck pain is a major contributor to disability worldwide with about 70% of the population experiencing an episode of neck pain at sometime during their lives.¹

One reason for the development of pain in the neck region is due to development of trigger points due to involvement of the trapezius muscle. People of any age can develop Myofascial trigger points. But greatest numbers were between the ages of 18-50 years. Myofascial trigger points occur in both sexes although it appears to be more common in females than males.^{2,3}

Clinically a trigger point (TP) is defined as a hyperirritable focus in a muscle or fascia that is tender to palpation and may upon compression result in the referred pain or tenderness in a characteristic "zone".⁴ Myofascial pain seen in medical practice with a point prevalence of 10% to 18% and lifetime prevalence of 30% to 50 % (cakit, 2009).^{5,3} Common causes for activation of trigger points include lack of exercise, prolonged poor posture, emotional distress, arm rests that are too high, sitting without a firm back support (sitting slumped), head-forward posture, any position in which the shoulders are held up for periods of time may perpetuate trigger points in this muscle.^{6,7} Owing to the heterogeneity of the existing clinical trials, examining manual and non-manual techniques on trigger point deactivation, non manual techniques have only immediate effects whereas manual approaches have both immediate and short term pain relief.

Integrated neuromuscular inhibition technique allows for the delivery of the technique in a single although randomized controlled trails (RCT) exists studying the efficacy of ischemic compression (IC) and strain counter strain (SCS) in neck pain, there is lack of evidence regarding the combined effects of integrated neuromuscular inhibitory technique along with strength training.^{6,5,9} which should be included as a rehabilitative phase after trigger release. For this reason additional research examining the effectiveness was warranted.

The aim of the study was to evaluate the effect of integrated neuromuscular inhibitory technique along with specific strength training in reducing pain, improving ROM and functional activities in individuals with upper trapezius trigger points. We hypothesized that the intervention would lead to significantly increased in both groups but compared to control group experimental group shows a highly significant values.

MATERIALS AND METHODS

- Thirty subjects aged between 18-35 years of age with upper trapezius trigger points who were referred to the department of physiotherapy at SVIMS. All participants with upper trapezius trigger points were diagnosed from outpatient departments of SVIMS and BIRRD hospitals Tirupathi, Andhra Pradesh, were included in the study. Informed consent was obtained from all the subjects.

Inclusion criteria:

palpable tender spot in upper trapezius muscle.⁸
Reproduction of subjects pain upon palpation.⁸
Jump sign characterized by patients vocalization or withdrawal, Limitation of neck movements due to pain.⁸ Pain of at least 3 on a visual analogue scale.⁶

Exclusion criteria

- Subjects with moderate to severe cervical, thoracic and shoulder degenerative pathology.⁶
Subjects having recent history of trauma to spine or neck shoulder region, history of surgery to spine and shoulder, Subjects with congenital and acquired spinal deformities, Previous history of Trigger point injections

Outcome measures

- visual analogue scale –primary outcome
- neck disability index
- cervical range of motion

Visual analogue scale recording

The visual analogue scale is a 10cm straight line with numbers 0 to 10 where 0 symbolized no pain and 10 symbolized the worst tolerable pain and participants were asked to mark a point on this line as per the severity of pain which indicates present pain perception level

Neck disability index score:

The NDI questionnaire is a 10 item questionnaire which included feedback of the subjects regarding their pain ability to concentrate and presence of headache. The scale consisted of discrete categories within which each item was weighted and response was summed up and its percentage was taken.

Goniometric assessment of cervical range of motion

The universal goniometer was used to measure the cervical range of motion of lateral flexion and rotation.

A total number of thirty subjects were randomly assigned to two groups. Group A comprised of 15 subjects and was treated with integrated neuromuscular inhibitory technique alone with

specific strength training while Group B INIT alone. All subjects were assessed to rule out pain in the neck due to upper trapezius trigger points were included in the study and an informed consent was obtained from the subjects. The subject's intensity of pain was documented on visual analogue scale (VAS). The subjects were then provided with a neck disability questionnaire (NDI). The questions on the scale were explained in detail and the subjects were then asked to choose the most appropriate alternative.

After pain scale and NDI questionnaire was administered, cervical range of motion was measured. The trigger point in the upper trapezius was identified and marked with the marker.

Integrated neuromuscular inhibitory technique sequences

Both experimental and control group received INIT initially powder was applied where trigger point was marked. Trigger point pressure release was applied by using pincer grip between thumb and index finger intermittently until the patient reported that the local or referred symptoms have reduced. The pressure was applied in an intermittent manner initially and then continuously for 90 seconds according to patient's tolerability. After this the patient's head was passively laterally flexed towards the affected side; the therapist then held the patient's forearm and moved the affected side shoulder passively to approximately 90° of abduction while monitoring the trigger point pain with the other hand.

The upper trapezius was stretched using muscle energy technique (MET). The patient was asked to take the stabilized shoulder towards the ear (a shrug movement), the degree of contraction should be mild and pain free. The contraction was

sustained for 10 seconds and upon complete relaxation effort, the therapist gently eased the head/neck into an increased degree of side bending and rotation and the shoulder was stretched caudally. The stretch was maintained for 10-30 seconds.

Duration of treatment:

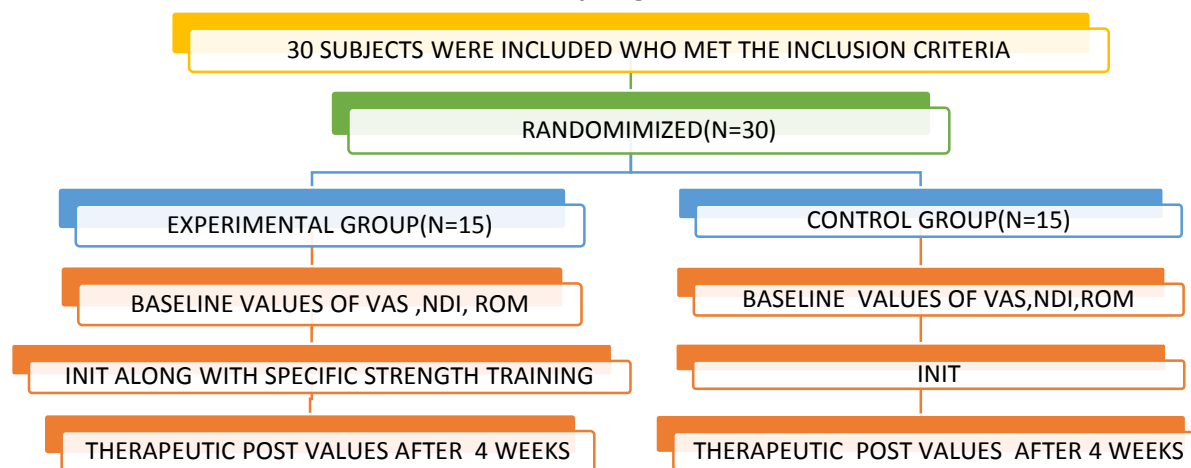
15 minutes of INIT with 1 session per day with alternate days in 4 weeks with total 14 sessions of treatment.

Group A received specific strength training along with INIT initially a warm up phase for Free exercises of neck are encouraged with the patient in sitting position of flexion, extension lateral flexion and rotation 5 times each as a warm up phase. Then stretch of the upper trapezius in subject lying on supine head supported against the therapist in slight flexion. Therapist stretches with the thenar of hand down towards muscle insertion and the other hand and body to bend the head and the cervical spine to the opposite side hold for 10 sec and relax perform 3 times for one session.

Subsequently, cervical isometrics sitting position by giving resistance on the forehead (cervical flexion, extension, rotation and side-bending) for 10 sec with 15-sec breaks between holds with 10-15 repetitions in a progressive manner. In addition, dumb-bell exercises for strengthening of the upper trapezius with the subject in standing position ask the subject to shrug the shoulder with initially 1 kg weight dumbbell 2 sets of 15 repetitions with weights varying from 1 to 2 kg. A 5-min rest is taken between sets.

Duration of treatment: 15 minutes of INIT and 15 min of strength training with 1 session per day with alternate days in 4 weeks with total 14 sessions of treatment.

Study algorithm



STATISTICAL ANALYSIS AND RESULTS: Statistical analysis has been carried out to analyze

the significant impact of the treatment issued to the subjects of both control and experimental groups

by using IBM SPSS Inc.20.0 version for this purpose the data was entered into Microsoft excels spread sheet, tabulated and subjected to statistical analysis. Statistical tools unpaired t-test has been

applied for parameters in between groups and paired sample t- test for parameters within group. Descriptive measures like mean, standard deviation have been reported along with p-value.

Table 1: COMPARISION BETWEEN EXPERIMENTAL GROUP AND CONTROL GROUP:

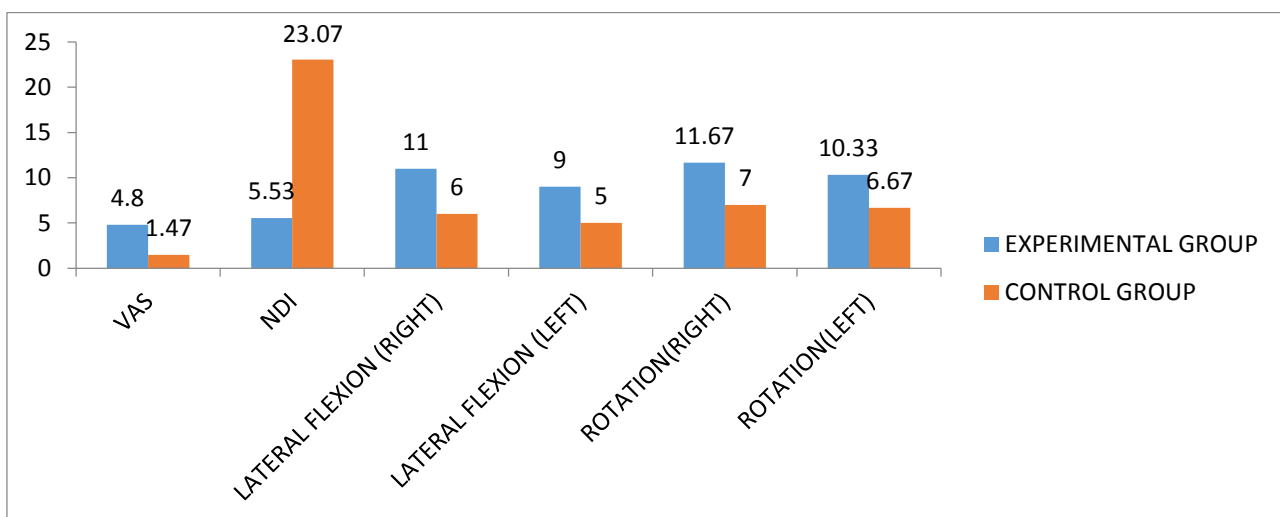
	GROPUS	N	Mean	Std. Deviation
VAS	EXPERIMENTAL GROUP	15	4.8	0.775
	CONTROL GROUP	15	1.47	0.99
NDI	EXPERIMENTAL GROUP	15	5.5	2.615
	CONTROL GROUP	15	23.07	10.666
LATERAL FLEXION(RIGHT)	EXPERIMENTAL GROUP	15	11	4.309
	CONTROL GROUP	15	6	3.873
LATERAL FLEXION(LEFT)	EXPERIMENTAL GROUP	15	9	3.381
	CONTROL GROUP	15	5	2.673
ROTATION(RIGHT)	EXPERIMENTAL GROUP	15	11.67	2.44
	CONTROL GROUP	15	7	4.14
ROTATION(LEFT)	EXPERIMENTAL GROUP	15	10.33	4.419
	CONTROL GROUP	15	6.67	3.086

RESULTS

The post mean difference values of vas of experimental and control group are 4.8 and 1.47, with (p<0.05), and for NDI pre and post mean difference for experimental group 5.5 and 23.07.on

performing the independent sample t-test, it was observed that a statistical significance (p<0.05) existing between control and experimental group with respect to ROM and it is noticed that the experimental group has found to be better with greater mean difference than the control group.

Fig-1: Representation of post mean between experimental group and control group:



DISCUSSION

The results of the present study shows that subjects in experimental group who received INIT along with strength training there was a significant reduction in pain by a mean change of VAS of 4.8mm to subjects in the control group of 1.47 mm .the pain reduction may be due to activation of mechanoreceptors by pain gate mechanism during trigger point pressure release which results in increased circulation ultimately resulted in pain reduction. INIT along with strength training also

reduced the participant's neck disability by a mean change of 23.07 compared to INIT alone. Lastly cervical side bending and rotation was significantly improved by a mean change of 11° for those receiving INIT alone is 6°.

Our study agree with the previously published trials indicating the effect of INIT .Study conducted by Amit v Nagrale et al (2010) the effect of INIT on upper trapezius trigger points in subjects with non -specific neck pain on 60 subjects in which 30

subjects were randomized to receive METs and 30 subjects received INIT subjects who received INIT reduced their pain levels by VAS of 1.18 mm compared to MET alone.⁸

Chaitow, 2001; Farina et al, 2004 integrated neuromuscular inhibitory technique (INIT) .The effectiveness of INIT was reported in two case series, which showed rapid results. Travell described that the ischemic compression decreases the sensitivity of pain nodules in the muscles and Simons proposed that the local pressure may equalize the length of the sarcomere in the involved muscle and decrease the pain, in addition, SCS has been proposed as a mechanism of facilitating unopposed arterial filling which allows for the reduction of tone in muscle and decrease pain.

In the present study addition of specific strength training approach proved to be effective in improving all the three outcomes, these results again agree with the previous research in this area as reports have indicated the benefit of such approach in reducing pain and significantly improving the functional status. Ylinen J Takala 2003 concluded in his study that strength and endurance training with 12 day institutional program followed by advice to exercise regularly at home were effectively methods for decreasing pain and disability in women with chronic neck pain. WILLIAM E. PRENTICE in their book on musculoskeletal rehabilitation proposed that strength training and endurance protocol should be included after treatment of trigger points in preventing the reoccurrence Strength training exercises should be given as a rehabilitative program after INIT to prevent the reoccurrence of the trigger points. Based on the statistical analysis the alternate hypothesis stating that the effectiveness of INIT along with strength training is more significant in subjects with upper trapezius trigger points .So alternate hypothesis can be accepted and null hypothesis is rejected.

Conclusion

The present study was done to find out the effectiveness of INIT alone and INIT along with strength training in upper trapezius trigger point patients. This study supports that trigger points in trapezius can cause neck pain with restriction in cervical ROM and increased disability. According

to the neck disability index, individually both experimental and control group were found to be effective in reducing pain and improving cervical ROM and reducing neck disability. However when both groups were compared, there was a significant improvement in experimental group with greater mean than the control group.

Recommendations

The future study is recommended with large sample size, more than four weeks duration for better results, recommended to do in other age groups.

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