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ORIGINAL ARTICLE

Combined Effect of Dry Needling and Strain Counter Strain Technique in Myofascial Trigger Points of Upper Trapezius

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ABSTRACT

Aim: To evaluate the combined effect of dry needling and strain counter strain technique in myofascial trigger points of upper.
Method: This randomized control trial study was conducted at Male and Female physiotherapy ward, Outdoor, Mayo Hospital, Lahore. 28 patients who had complain of taut band, tenderness and referred pain and fulfill the inclusion criteria were enrolled in this research via non-probability consecutive sampling which randomized later and allocated to two equal groups. Group A (n=14) was experimental group treated by Dry needling and strain counter strain with baseline treatment. Group B (n=14) was a control group treated by Strain counter strain with baseline treatment. Baseline Physiotherapy Protocol that was given to every patient: Hot pack for 10 minutes, Trapezius muscle stretching, cervical muscle strengthening exercises (2 sets of 5 repetition each). Written consent was procured by every patient. Questioner that was used for data collection was Neck disability index (NDI) and other tools were Goniometer and Visual analogue scale (VAS).
Results: Descriptive statistics showed that participants having mean age of 27 in group A and 35 in group B. Participants who received dry needling and SCS showed marked improvement as compare to group B. Statistically significant improvement found in all variables that were measured following the intervention ($P<0.05$). The pre-treatment mean score for NDI in group A was 3.50±0.519, while in group B was 3.64±0.497. After 8 weeks of treatment, the mean score in group A was 1.79±0.579, and in group B was 2.64±0.497 with the p value <0.0001 is less than 0.05 showed that Combined treatment effect of dry needling and Strain counter strain and control group treatment with strain counter strain only both are statistically significant in improving pain in Trigger points of the upper trapezius.
Conclusion: It was concluded from the study that the combined technique of Dry needling and strain counter strain and only strain counter strain technique with baseline treatment both are effective in reducing pain and better active range of motion outcome as $p=0.000$ that $p<0.005$ showed both techniques are statistically significant but the mean value of Study group A is more than control group B, so Combined technique study group A is more effective than Strain counter strain technique with baseline treatment of control group B.
Keywords: Dry needling, Strain counter strain, Visual analogue scale, Neck disability index.

INTRODUCTION

Myofascial trigger point (MTrPs) is actually a highly irritable point present in the skeletal muscle rigid band that is highly painful when it is compressed and can be linked with motor dysfunctioning, as a referral pain and autonomic phenomena as well[1]. Sensory changes that occur by myofascial trigger point are hyperalgesia, dysesthesia while sweating, increase in skin temperature, redness of skin are its autonomic features. whenever on pressing the trigger point there is increase in the pain and produce the effects at the reference zone or at target area[2]. By Travell and Simons definition of myofascial pain syndrome in which there is taut band in skeletal muscle that are palpable and discrete nodules that cause spontaneous pain on compression, these spontaneous painful nodules are active myofascial trigger points(a-MTrP)[3,4].

Most common cause of muscular joint pain in patients who present to physical therapist for the treatment is Myofascial Trigger Points (MTrPs) the most sensitive muscle is upper trapezius among the 8 distinct muscles that are pectoralis major, levator scapulae upper trapezius, teres major, paraspinals supraspinatus, infraspinatus[5,6].

Trigger points can be identified by subjective and objective findings include the firm palpation taut band within the muscle, localized twitch response, limited stretched ranges of motion, have weakness with no muscle atrophy and no neurological signs appearance[7], while in subjective signs patient do complain of stiffness, fatigues, pain in a distribution pattern, and tenderness at trigger point[8]. Referred pain is induce in pattern when pressure is sustained on trigger point. While radiographic and laboratory findings for trigger point always negative[9].

There is also a confirmatory criteria of localized twitch reaction on splinter palpation of stressed band, while for diagnosis of latent myofacial trigger point spot tenderness and taut band is enough for it[10]. Dry needling is an invasive procedure in which under the skin and muscle needle is inserted for the intramuscular stimulation (IMS)[11]. There are many benefits of dry needling in immediate improvement in regional, or referred, restore the rages of motion and improve muscle activation pattern. Strain counter strain is an osteopathic approach in which there is a specific positioning of the patient made passively by physical therapist or osteopath for 90 seconds for the reduction of trigger point sensitivity. strain counter strain for the upper trapezius is side flexion ipsilaterally with opposite side rotation, external rotation, and ipsilateral shoulder abduction, and this state of body is sustained up to ninety seconds[12,13].

In the present knowledge and prospect found in some databases, there is hardly any study found that show the combined consequence of strain counter strain and dry needling in the myofascial trigger point of upper trapezius. Furthermore, prior or introductory data is not present to find out the effect of dry needling (DN) with strain counter strain (SCS) on pain intensity and functional disorder in patients of myofascial trigger points in upper trapezius

The purpose of this study is to find out the combined effect of dry needling and Strain counter strain technique in myofascial trigger points of upper trapezius.

This research would add another evidence in highlighting the combined effect technique of dry needling and strain counter strain in myofascial trigger points of upper trapezius.

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MATERIALS & METHODS

Current study was selected by randomized controlled trial. After getting approval from ethical committee of School of Physiotherapy, Mayo Hospital, **28 patients** who had complain of taut band, tenderness and referred pain and fulfill the inclusion criteria were included. There was random manual data collection of patients to both groups; an intervention group and control group. Sample size was calculated 28(14 in each group) by EPI Tool as Mean 1=30.0 and Mean 2=34.1, variance was 5 with confidence interval of 0.95.

Inclusive criteria for the study was patients have rigid band, local tenderness, referred pain, localized twitch response (LTR) and jump sign(14, 15).The presence of active symptomatic MTPs in the upper trapezius bilateral pain involving the upper trapezius.

Exclusive criteria for the study were participants have Traumatic injuries history like fracture whiplash injury and contusion, needle phobia patients. systemic diseases, cervical spine surgery patients, orofacial pain and temporomandibular disorders, neuronal disorders like trigeminal neuralgia, migraine or tension type primary headache.

Treatment interventions: Performa was collected and participants were received an informed consent. Pretreatment reading of pain was recorded on visual analogue scale while the functional status recorded by neck disability index (NDI). Patients were treated in the span of 8 weeks (2 treatment sessions /0-2week then 1 treatment session/2-4 week and base line treatment session/4-8 week). Readings collected after 4week and After that post treatment values was recorded and analyzed for possible changes by same scales VAS and NDI.

Interventional Group A was treated by an osteopathic approach strain counter strain which there is a specific positioning of the patient made passively by physical therapist for 90 seconds for the reduction of trigger point sensitivity. strain counter strain for upper trapezius is side flexion ipsilaterally with opposite side rotation, ipsilateral shoulder abduction and external rotation, and this position is sustained upto 90 seconds[12] and its combined technique was Dry needling according to Baldry needle inserted into the tissue to the depth of 5-10mm upto 30 seconds where MTrP present it immediately decreased the sensitivity and if there was any residual pain reinsert it for 2-3 minutes, In normal responder needle remain inserted for 60 sec otherwise in slow responder needle left for 2-3 minutes[16].

Control Group B was treated by only Strain counter strain technique with the same protocol as given to group A and with baseline treatment (hot pack 10 mints, stretching, neck isometric (2 sets of 5 reputations)

Assessment of the participants was done at baseline (pretreatment), mid-treatment and post-treatment following eight weeks of intervention. The assessor was taken on board who was not directly involved in treatment provision and was also kept blind to the allocation of each patient to their respective group. The assessor was a competent, qualified, practicing and an experienced physical therapist as well as an efficient administrator of NDI. Although special training was not necessary to administer the NDI and VAS tools, researches recommend that the administrator must be familiar with assessment of myofacial trigger points of upper trapezius. The patients were re-evaluated by the same assessor at post-treatment.

Outcome Measurements: Neck Disability index (NDI): Outcome measure, used in this study, has been considered as one of the most efficient tool for approaching an initial assessment. We have used NDI to determine functional disability and to find how severe a given case of myofacial trigger points of upper trapezius. This scoring system might helped in concentration, movement, sleeping pattern and pain. Neck Disability scale has been the best standard tool measure to assess the level of functional status among patients with myofacial trigger points of upper trapezius. As this assessment tool is best to find the efficacy of intervention with the passage of time.

Statistical analysis: Data analysis was executed by using SPSS 16. Demographics data such as age, gender, marital status, occupation history was recorded by the pre designed Performa, using standard deviation and mean to interpret the descriptive statistics. All quantitative variables were presented in the form of mean ±SD along with its range (max-min). For normal distribution of data, Shapiro-wilk test has been used. After assuming normality, independent sample t test was used to assess mean difference between groups repeated measure ANOVA was used to find the difference within the group. T-test was applied to compare the mean differences of quantitative variables. P-value <0.05 was taken as significant.

RESULTS

Participants were included by proper evaluation at the time of enrollment for eligibility and baseline assessment; 28 patients, fulfilling the inclusion criteria, were allocated randomly into two equal groups. Hence, 28 participants' data were statistically analyzed. Table 1 shows that out of 14(100%) subjects, 9 were male and 5 were female in group A. In Group B out of 14(100%) subjects, 6 were male and 8 were female. mean age in group A= 31.00±2.00 and in group B = 29.50± 1.00. Patient cases are distributed according to occupation status has showed out of 28(100%) subjects in both groups; 9 belong to sedentary workers and 8 belong to labor,4 are house wives and 8 belong to any other occupation.

Baseline or Pre-treatment Mean Difference: Pre-treatment mean difference indicated that indicated that both groups, interventional and control group, showed no significant difference in any of the concerned outcome variables (P>0.05).

Pre-treatment, mid-assessment & post-intervention VAS comparison in group A and B: Pre-treatment VAS value at week 0 mean difference was 2.93±0.267. After 4 week treatment mean score was 1.93±0.267and 8 week post treatment mean score was 1.07±0.267 Pre-treatment,4 week mid-assessment and 8 week post-intervention comparison in group B: Pre-treatment VAS mean score was 3.00±0.00, After 4 week treatment mean score was 2.29±0.46 and after post treatment mean score was 1.86±0.363.

Pre-treatment, mid-assessment & post-intervention NDI comparison in group A and B: Pre(week 0), mid(week 4) and post(week 8) treatment comparison of NDI has shown that pre treatment(week 0) NDI value in Study group A was 3.50±0.519 and mid (week 4) treatment mean score was 2.43±0.514 and post treatment(week 8) mean score was1.79 ±0.579.In Control group B Pre(week 0) , mid(week 4) and post(week 8)treatment comparison of NDI has showed that pre-treatment(week 0) NDI value was 3.64±0.497 and mid(week 4)treatment mean score was 3.00±0.555 and post treatment(week 8) NDI value was 2.64±0.497with the p value <0.0001 that is less than 0.05.

Table 1: Socio-demoghraphic characteristics of participants

Age of patient(years)		
Treatment Group	Mean	30.79
	Std. Deviation	5.338
	Minimum	22
	Maximum	40
Control Group	Mean	32.21
	Std. Deviation	5.071
	Minimum	20
	Maximum	39
Gender		
Female Male		46.4% 53.6%
Occupation	Sedentary worker Labour House wife Any other	32.14% 25% 14.28% 28.57%

Table 2: VAS Pre and Post-treatment comparison in group A and B

Treatment week	Group	N	Mean	Std. Deviation
VAS week 0	A	14	2.93	.267
	B	14	3.00	0.00
VAS week 4	A	14	1.93	.267
	B	14	2.29	0.469
VAS week 8	A	14	1.07	.267
	B	14	1.86	0.363

Table 3: NDI Pre and post-treatment comparison in group A and B

Treatment week	Group	Number	Mean	Std. Deviation
NDI week 0	A	14	3.50	.519
	B	14	3.64	0.497
NDI week 4	A	14	2.43	.514
	B	14	3.00	0.555
NDI week 8	A	14	1.79	.579
	B	14	2.64	0.497

Table 4: CRLF Pre and post-treatment treatment in group A and B

Right Lateral Flexion	Group	Number	Mean	Std. Deviation
week 0	A	14	21.50	3.632
	B	14	22.36	3.342
week 4	A	14	29.71	3.604
	B	14	26.26	3.483
week 8	A	14	35.93	3.812
	B	14	30.79	3.239

Table 5: CLLF pre and post-treatment in group A and B

Left Lateral Flexion	Group	Number	Mean	Std. Deviation
week 0	A	14	22.21	3.215
	B	14	22.36	3.104
week 4	A	14	28.43	2.901
	B	14	25.93	2.999
week 8	A	14	35.71	2.840
	B	14	27.57	3.005

Table 6: Pre and post treatment repeated measure Anova

Treatment week	Study Group A (n=14)	Control Group B (n=14)
	Mean ± SD	Mean± SD
Pain(Visual Analogue Scale)		
Week 0	2.93±0.267	3.00±0.000
Week 4	1.93±0.267	2.29±0.469
Week 8	1.07±0.267	1.86±3.63
P Value	<0.001	<0.001
Function(Neck Disability Index)		
Week 0	3.50±0.519	3.64±0.497
Week 4	2.43±0.514	3.00±0.555
Week 8	1.79 ±0.579.	2.64±0.497
P Value	<0.001	0.02 (<0.05)
Right side flexion		
Week 0	21.50±3.632	21.50±3.632
Week 4	29.71±3.604	26.86±3.483
Week 8	35.93±3.812.	30.79±3.239
P Value	<0.001	<0.001
Left side flexion		
Week 0	22.21±3.215	22.36±3.104
Week 4	28.43±2.901	25.93±2.999
Week 8	35.71±2.914.	27.57±.3.005
P Value	<0.001	<0.001

Table 7: Comparison Between group A and B in VAS, NDI, CLF ROM BY Independent t-test

Baseline	Study Group A (n=14)	Control Group B (n=14)	P value
	Mean ± SD	Mean ± SD	
Visual Analogue Scale	2.93±0.267	3.00±0.000	0.336
Neck Disability Index	3.50±0.519	3.64±0.497	0.464
Cervical Right Lateral Flexion	21.50±3.632	22.36±3.342	0.522
Cervical left Lateral Flexion	22.21±3.215	22.36±3.104	0.906
Mid Treatment Value			
Visual Analogue Scale	1.93±0.267	2.29±0.469	0.022
Neck Disability Index	2.43±0.514	3.00±0.555	0.009
Cervical Right Lateral Flexion	29.71±3.604	26.86±3.483	0.043
Cervical left Lateral Flexion	28.43±2.901	25.93±2.999	0.034
Post Treatment Value			
Visual Analogue Scale	1.07±0.267	1.86±0.363	<0.001
Neck Disability Index	1.79±0.579	2.64±0.497	<0.001
Cervical Right Lateral Flexion	35.93±3.812	30.79±3.239	0.001
Cervical left Lateral Flexion	35.71±2.840	27.57±3.005	<0.001

DISCUSSION

The aim of this study was to find the combined effect of Dry needling and strain counter strain technique along conventional physical therapy in reducing pain and improve functional status, and cervical ranges of motion in patients of myofacial trigger points of upper trapezius. Within group analysis revealed that there was a significant reduction in patient reported pain scores when pre treatment, mid treatment and post intervention scores were compared in Study group A and Control Group B.

This randomized controlled trial study included two groups having 14 patients in each group. One group was treated with Dry needling with strain counter strain along the conventional physiotherapy treatment and other group was treated with strain counter strain along conventional rehabilitation program.

Combined effect of dry needling and strain counter strain technique was found clinically superior than control group strain counter strain technique with baseline treatment in reducing pain and improving functional status as mean paired difference of pretreatment, mid treatment & post treatment scores of pain on VAS & NDI were greater for Study group A than Control group B[17].

This research pointed out that, Combined technique of Dry needling and strain counter strain and only strain counter strain technique with baseline treatment both are effective in reducing pain and better active range of motion outcome as p=0.000 that p<0.005 showed both techniques are statistically significant but the mean value of Study group A is more than control group B, so Combined technique study group A is more effective than Strain counter strain technique with baseline treatment of control group B[18].

CONCLUSION

Post assessment of patients on NDI, VAS scale indicated that the combined effect of dry needling along SCS regimen has produced effective and better outcomes than the solely outcomes of SCS along baseline treatment. On the basis of data analysis, my study concluded that combined effect of dry needling and SCS along conventional physical therapy is more effective in myofascial trigger points of upper trapezius.

Authorship and contribution Declaration: Each author of this article fulfilled following Criteria of Authorship:

1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version for publication.
4. All authors agree to be responsible for all aspects of their research work

Conflict of interest: Nil
Limitations: In this research, there was limitation of sample size, sample size was not sufficient to generalize the results. Follow up should be of more duration to get better results.
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