Original Article

Comparison of dry needling and Graston technique on active myofascial trigger points in upper trapezius

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Objective: To compare the effects of dry needling (DN) and Graston techniques (GR) in upper trapezius (UT) active myofascial trigger points (MTrP).

Methodology: This Randomized control trial was conducted at Rawal General and Dental Hospital, Rawalpindi from January to June 2019. A purposive non-probability sampling technique was used. We included 30 patients with MTrP in UT who were randomly allocated by sealed envelope method in two groups; Dry needling (DN) and Graston (GR). Group DN received dry needling whereas Group GR received Graston technique. Both groups received conventional treatment with home plan exercises. All were assessed at Pre-test and Post-test using Neck disability index (NDI), Myofacial diagnostic scale (MDS), Numeric pain rating scale (NPRS) and Cervical Range of movement (CROM). The data were analyzed using SPSS 23.

Results: Both groups showed significant improvement ($p < 0.05$) in all outcomes. Comparative analysis showed significant improvement in DN group ($p < 0.05$) in terms of MDS, NDI, NPRS and CROM with DN.

Conclusion: Upper trapezius trigger points are more responsive to dry needling therapy resulting in better clinical outcomes like decrease in pain, improved neck movements and minimum activity limitation.

Keywords: Myofascial trigger points, upper trapezius, neck pain, dry needling, Graston therapy.

INTRODUCTION

The MTrP is a tender spot in skeletal muscle that is associated with an oversensitive palpable nodule in a tense band.[1] The spot gives pain when compressed and can give escalation to specific radiating pain, tenderness, motor dysfunction, and autonomic occurrences.[2] The strenuous activity as well as poor static posture can develop MTrPs.[3] These Trigger points can develop from any acute injury or by cumulative micro-traumas.[4,5]

Treatment of active MTrPs has been done by two non-traditional methods as dry needling (DN) and Graston technique (GT).[6] The DN is comparatively a new method which involves inserting a fine needle into an MTrP without any medicine filled injection. Many studies found it effective for reducing somatic pain, dysfunction and activity restriction.[7-9] Graston technique is an instrument assisted treatment method (IASTM) used for diagnostic and therapeutic purpose.[10] Although both techniques are getting quite popular among physical therapists (PT) including Pakistan but there is paucity of national studies comparing two techniques. This experimental study aimed to compare the use of DN versus GTue for the treatment of upper trapezius MTrPs.

METHODOLOGY

This Randomized controlled trial was conducted in Physiotherapy department of Rawal General and Dental Hospital, Rawalpindi from January to June 2019. The sample size was calculated using www.openepitool.com the calculated sample size was 18 but it was extrapolated to 30 an order to handle dropouts. The study was approved by Institutional Review Board (Riphah/RCRS/REC/00498) and Informed written consent was taken from all participants. This trial was registered at www.clinicaltrials.gov (NCT033946995).

Participants were selected through sealed envelope random sampling. Pain was measured by numerical pan rating scale for this purpose, statistical analysis the average of the first and the second reading was taken. This scale has high reliability (0.95 – 0.96) and (0.86 – 0.96) validity.[12] Disability was measured by neck disability index (NDI) Items of the tool address both neck pain and functional status, which possesses fair test-retest reliability.[13] NDI has excellent retest reliability (ICC = 0.89) and validity (r = 0.69 – 0.70).[14] Trigger points are palpated by flat palpation method and measured by myofascial diagnostic scale, the cervical range of motion was measured by inclinometer The tool has content and constructs reliability MDS Chronbach's alpha (0.67 – 0.754) for trapezius muscle.[15]

The cervical range of motion has shown high validity and reliability of (0.93 – 0.98) and (ICC = 0.98)

respectively.[16] All measures were collected at baseline and after 2 weeks as past-test. The visits were twice a week for treatment. In dry needling group Patients were in setting position while physiotherapist firmly pincer grip upper trapezius to locate trigger point for dry needling. Hot pack was given to patent for 10 mines before session. It was performed by a fili form needle (25 – 40mm) by directing it upwards and posteriorly across muscle. Patients were in setting position while physiotherapist strike instrument in a longitudinal direction and in circular patterns. Strikes were performed parallel to muscle fibers.[17] The instruments were used in a multidirectional stroking design connected to the skin at a 30° – 60° points at the treatment site.[18] Hot pack is given to patent for 10 mines before session; stretching and strengthening exercises are given after the session.

Statistical Analysis: The data were analyzed using SPSS version 23.Mann Whitney U test Wilcoxon sign Rank Test were used between the groups among different variables pretest and posttest MDS. $p < 0.05$ was considered significant.

RESULTS

Total of 30 participants were analyzed (15 in each group). The mean age of group DN was 31.07 ± 6.1 and group GR 27.33 ± 6.1 years. Gender distribution was seen in both groups. In each variable, pre and post-test information related to MDS, NPRS, NDI and CROM were analyzed using Mann Whitney U test, which showed significant improvement in the cervical ranges, pain on MDS and NDI scale after applying DN and GT (Table 1).

Table 1: Mann Whitney U test between the groups among different variables pretest and posttest MDS.

Variable		(DN Group) MR	(GR Group) MR	P value
MDS	Pre Test	15.37	15.63	0.927
	Post Test	20.87	10.13	**0.000**
NDI	Pre Test	12.70	18.30	0.080
	Post test	17.17	13.83	0.270
NPRS	Pre test	17.47	13.53	0.186
	Post test	22.40	8.60	**0.000**
Cervical Flexion	Pre test	14.13	16.87	0.377
	Post test	20.40	10.60	**0.001**
Cervical Extension	Pre test	12.63	18.37	0.070
	Post test	19.00	12.00	**0.005**
Cervical Rotation (Right)	Pre test	13.77	17.23	0.263
	Post test	20.10	10.90	**0.003**
Cervical Rotation (Left)	Pre test	14.93	14.93	0.717
	Post test	20.17	10.83	**0.002**
Lateral flexion (Left)	Pre Test	15.60	20.60	0.949
	Post test	15.40	20.60	**0.001**
Lateral flexion (Right)	Pre test	14.20	16.80	0.395
	Post test	21.20	9.80	**0.000**

Table 2: Wilcoxon sign Rank Test.

Variable		(DN Group) MR	(GR Group) MR	P-value
MDS	Pre Test	8	8	0.001
	Post Test	0	0	**0.001**
NDI	Pre Test	8	8	0.001
	Post test	0	0	0.001
NPRS	Pre test	8	8	0.001
	Post test	0	0	**0.001**
Cervical Flexion	Pre test	8	7.50	0.001
	Post test	0	0	**0.001**
Cervical Extension	Pre test	7.5	6.50	0.001
	Post test	0	0	**0.002**
Cervical Rotation (Right)	Pre test	8	6.50	0.001
	Post test	0	0	**0.002**
Cervical Rotation (Left)	Pre test	8	6	0.001
	Post test	0	0	**0.002**
Lateral Flexion (Left)	Pre Test	8	7.50	0.001
	Post test	0	0	**0.001**
Lateral Flexion (Right)	Pre test	8	7	0.001
	Post test	0	0	**0.001**

MDS: Myofacial diagnostic scale. NDI: Neck disability index. NPRS: Numeric pain rating scale.

Within group analysis, Wilcoxon signed rank test was applied on MDS, NPRS, NDI and CROM and it indicated significant improvement in the cervical ranges, pain on MDS and NDI scale after applying DN and GT (Table 2).

DISCUSSION

A prospective, clinical trial study of 20 patents with upper trapezius MTrPs and 20 healthy volunteers showed that after DN, PPT increased in patents but decreased in healthy volunteers ($p < 0.01$).[19] Our study is also compliant with these results as patients reported significant decrease in pain after dry needling. Cummings and White found that DN of MTrPs was an effective treatment.[7]

Another study found that DN, compared with control, decreased pain immediately after the treatment and in 4 weeks (2 sessions per week) in patients with upper quarter myofascial pain syndrome.[20] Another study was fund that single session of DN was very effective in regard to pan score and cervical range of motion which is similar to the results of our research.[21]

Short come and long-term effects of sustained pressure and TrP dry needling in patients having neck myofascial pain found no significant differences between both groups.[22] But in our study, DN proved to be more effective. A RCT on comparison of the short-term outcomes between trigger point DN vs. trigger point manual therapy for the management of chronic mechanical neck pain (upper trapezius), found that both groups shows similar decrease in intensity of neck pain.[23] Our study showed statistically non-significant results between DN, as reported in another study.[24]

CONCLUSION

Dry needling and Graston instruments techniques both were found usefull in the treatment of active myofacial point's pain in the upper trapezius. However, dry needling showed better clinical outcomes than Graston technique in our study.

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Conception and design: Kiran Haq, Huma Riaz.
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Critical revision of article for important intellectual content: Kiran Haq.
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