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Efficacy of Theragun and Surge Faradic Stimulation in Subjects with Trapezitis: A Randomized Controlled Trial

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Abstract: ***Background**: Trapezitis is the spasm in the neck and more common nowadays. SSF is the well known treatment for the treatment of spasm. Theragun is a device works on percussion therapy law for spasm of muscles. To find out whether there is any significant difference between the effectiveness of surged faradic current versus theragun in subjects with trapezitis. CTRI number is CTRI/2021/03/032141, after taking Ethical Consideration from the ethical committee of Nootan College of Physiotherapy Study carried out at Nootan College of Physiotherapy with forty five patients and written consent was taken from the participants. They were selected on the basis of inclusion and exclusion criteria. The study was done with SPSS v.26. According to the analysis comparison between SSF and Theragun with control group as done and gave significant result in Group A treated with theragun. Treatment in the study concluded the effectiveness of Theragun for the patients with trapezitis.*

Keywords: Trapezitis, Theragun, SSF, VAS

1. Introduction

Now-a-days as the technology has advanced the use of electronic devices has been increased. People spend most of their time on the gadgets and thus harming their neck as the neck is being hung on in flexed position. The work of people on desktops has been increased. Thus poor posture, spending most of time in same position and strain on the neck due to work has lead to increase in the neck pain in people. Most commonly the neck pain caused in the people is due to trapezitis. Trapezitis is the inflammation in the trapezius muscle which further leads to pain and spasm in the neck.[1]

The upper trapezius muscle is designated as postural muscle and it is highly susceptible to overuse. 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 .Trapezius muscle lies at the back of the neck and help in shrugging movement of the shoulders along with upward movement of the head.[2]

Trapezitis leads to pain at the back of neck, muscle spasm, shoulder pain, tingling or numbness in one or both arm and also decrease in the range of motion of the shoulder and neck. About two thirds of people experience neck pain at some points in their lives.[2]In middle age Prevalence is highest and women are more affected than men. Neck pain prevalence varies widely in 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 %).Various physiotherapy protocols have been advocated in the past like rest, heat, U.S., MWD, TENS, spray and stretch, and post-isometric relaxation in treatment of trapezius spasm.[3]

SSF or the Strong surged faradic current is a form of electrical muscle stimulation that is `short duration interrupted current with pulse duration of 0.1 to 1 ms and a frequency of 30-100 Hz. (analysis) Therapeutic faradic stimulation is another modality that can be used in management of trapezius spasm. It has various surges and it brings about tetanic like contractions in muscles followed by relaxation. The stimulation produces similar effects to that of voluntary contractions. Surging of faradic stimulation produces various beneficial effects not only on neuromuscular but also on the musculoskeletal properties. It leads to elevated blood flow to the muscles as well as rapid removal of waste metabolites from the body therefore enhancing the chemical and physiological properties of the muscle. It helps to enhance the contractile property of the muscle. It also prevents adhesion in the muscle by preventing the organization of lymph within the muscle tissue. Various studies have been conducted to study the effect of faradic stimulation in patients with muscle spasm there is paucity of evidence showing therapeutic effects of 50% and 100% strong surge faradism on trapezius muscle spasm.[4]

2. Review of Literature

1) Anand B Heggannavar et al. - 2018; conducted a study on ‘Compare the effect of 50% Ramp up and 100% ramp up Faradic stimulation in patients with non specific Trapezius spasm” on 36 subjects to compare the effect of 50% and 100% ramp-up faradic stimulation in patient with nonspecific trapezius spasm and they concluded that 50% ramp up faradic stimulation is better than 100% ramp up faradic stimulation in patient with nonspecific trapezius spasm according to the statistical analysis obtained.

2) Akanskhsa A Nalawade , Poonam H Patil - 2020 ; conducted study on "Comparison between SSF and TENS on myofascial trigger points in Trapezius" on 34 subjects to find out the effects of SSF and TENS on trapezius and conducted that patient who treated with SSF and phonophoresis had significant improvement clinically and statistically and improve ROM, VAS and reductions in Trapezius palpation.
3) Kshama S Shetty, A Joseph Oliver Raj - 2017 ; conducted a study on "Effect at SSF on myofascial trigger point of upper Trapezius muscle as compared with Manual Pressure Release" on 40 subjects study for intended to compare the effectiveness of SSF and Manual Pressure Release in Trapezius in upper trapezius muscle and concluded that SSF and Manual Pressure Release have got beneficial effect in reducing the pain intensity and increasing the ROM in patients with trapezius muscle in upper trapezius.
4) Dr. Roshni Patel, Dr. Atit Patel - 2020 ; conducted a study on "Effect of theragun on the improvement of back flexibility" on a subject for improvement of back flexibilty and conducted that the theragun is effective for improvement in the back flexibilty may also improve horse riding performance.
5) Hanniel Han Rong Lim et al. - 2020 conducted a study on "Cross-cultural adaptation, reliability, validity and responsiveness of the simplified version on Neck Disability Index" on 70 subjects with neck pain. The study concluded that NDI is a reliable, valid and responsive instrument to measure functional limitations in patients with neck pain.
6) Lukasz Pulik ,Nicola Dyrek,Aleksandra Piwowarczyk, Kaja Jaśkiewicz, Sylwia Sarzyńska & Paweł Łęgosz – 2020; published an article on "The update on scales and questionnaires used to assess cervical spine disorders". This review article is an up-to-date overview that provides an insight outcome measures, i.e. NMQ (Nordic Musculoskeletal Questionnaire) and VAS (Visual Analog Scale) and the tools specific for cervical pains: NDI (Neck Disability Index), NOOS (Neck Outcome Score), NPAD (Neck Pain and Disability Scale), and NPQ (Northwick Park Neck Pain Questionnaire) and concluded that all the above are valid for outcome measures.
7) Polly E. Bijur ,Wendy Silver ,E. John Gallagher MD – 2008 ; conducted a study on "Reliability of the Visual Analog Scale for Measurement of Acute Pain" which aims to access the reliability of VAS for measuring pain and they concluded reliability of the VAS.
8) Stephanic Guzman ,Dammar A.blanchet ,lena cook,Susan Herrera,,Meghan mccauley ,William pritchard-2014; conducted study on "The effects of a single percussive therapy application on active lower body ROM " on 24 subjects for study to examine the immediate effect of single percussive therapy via theragun treatment on active (unassisted)lower body ROM and conducted that A single 5-min percussive therapy treatment via thergun demonstrated efficacy in acutely increasing ROM of hip and knee joints when compared to passive rest.

3. Methodology

Research design was Randomized Controlled Trial. Sampling design was Simple Random Sampling including study population of people with trapezitis. (Pain from last 1 week)

Sample size: 45 subjects Group A-15 subjects: Theragun, Group B-15 subjects: Surged Faradic Current, Group C-15 subjects: Control Group. Study setting was carried out at Nootan College of Physiotherapy. Study duration was of 6 months (September-2020 to March-2021) Intervention duration was of 2 weeks (3 sessions/week).

Inclusion criteria was having age group of 20 -40 years with gender both male and female complaining of pain from last one week and palpable tender spots in the upper trapezius.

Excluding History of refereed pain due to cervical pathology, Fracture or healing fracture over neck and upper back region, Dermatitis over the upper back, Clotting disorder, Wound over neck, Shoulder pathology, Degenerative cervical spine

4. Procedure

Ethical approval was granted from the institutional ethical committee and the patients gave an informed written consent signed. All the 45 patients demographic data, physical examination were recorded. Each group consists of 15 participants of trapezitis. The theragun and surged faradic currect modality was first explained and demonstrated to the patients. Group A was treated with theragun and Group B was treated with Surged faradic current for trapezitis. Group C was controlled group and hence was not treated. The patient's position was sitting for both the treatment. The treatment was given to all the patients of Group A and B for 2 weeks alternately. The intervention is mentioned in the figues below. All the pre and post data is taken and statistical analysis is also mentioned.

TOOLS: Chair, Plinth, Theragun, Therapeutic, Electrical stimulation, Consent form, Mask, Sanitizer and Gloves

5. Intervention

Table 5.1: Group A = Theragun Protocol

Session	*Level of Frequency*	*Time*
SESSION 1	Level 1-2	5 Min
SESSION 2	Level 1-2	5 Min
SESSION 3	Level 3-4	5 Min
SESSION 4	Level 3-4	5 Min
SESSION 5	Level 5-6	5 Min
SESSION 6	Level 5-6	5 Min

Table 5.2: Group B: Surged Faradic Current.Protocol

Session	*Surge Frequency*	*No. of Contractions*
SESSION 1	50Hz	20 contractions
SESSION 2	50Hz	20 contractions
SESSION 3	50Hz	15 contractions
SESSION 4	50Hz	15 contractions
SESSION 5	50Hz	12 contractions
SESSION 6	50Hz	12 contractions

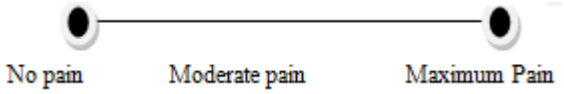
Figure 5.2: Theragun on Trapezius muscle

Figure 5.3: SF on Trapezius muscle

6. Outcome Measures

1) VAS scale (Visual analog scale For pain)

The visual analogue scale (VAS), has increased dramatically in the last decade. Consideration of the VAS in terms of its physical structure and the patient's behaviour when confronted with the scale, casts doubt on its validity. It is nonlinear and prone to bias which limits its use as a serial measure of pain severity.

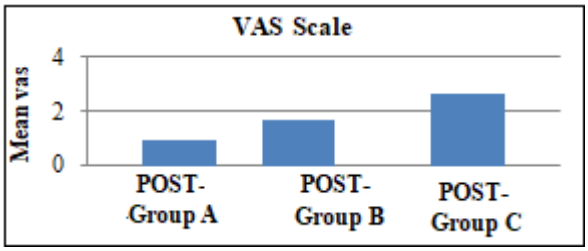


2) Range of Motion

A tool and process for measuring cervical spine active range of motion (AROM) that are clinically useful and reliable, when used on both healthy and symptomatic individuals Cervical spine AROM data are used by physical therapists to assist in identifying movement impairment, monitor patient progress, and evaluate the effectiveness of intervention.

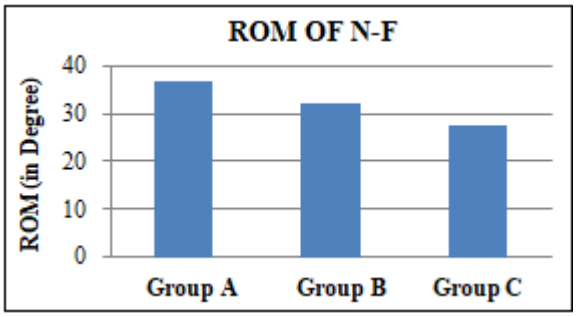
7. Result

Total 45subjects participated in this study, data analysis of all the 45subjects had been carried out. All the test and data showed significant difference in the pre and post outcomes. The p value was justified as <0.01 for all the post treatment data. This study revealed that, the Group A who received theragun showed more significant effect then the Group B who received Surged faradic current. The rest were controlled group and hence they did not received the treatment and did not had an appropriate improvement.



Graph 7.3: Group A, B, C Post VAS

N=45	*Group a (mean± sd)*	*Group b (mean ±sd)*	*Group c (mean± sd)*	*F value*	*P value*
PRE-VAS	2.60 .507	2.53 .516	2.73 .458	.636	.534
POST- VAS	1.00 .000	1.67 .617	2.67 .488	51.15	.000



Graph 7.5: Group A, B, C Post ROM

N=45	*Group a (mean± sd)*	*Group b (mean± sd)*	*Group c (mean± sd)*	*F value*	*P value*
PRE-ROM	26.2000 2.62406	26.4000 3.06594	27.4667 1.80739	*1.06*	*.353*
POST- ROM	36.6000 3.01899	31.9333 5.81214	27.4667 1.80739	*20.33*	*.000*

8. Discussion

The study was carried out to see the effectiveness of theragun and surged faradic current on the patients with trapezitis. A total 45 participants were selected for the study according to the selection criteria. The participants were of age group between 20-40 years. These participants were divided by randomization into 3 groups of 15 participants each. The pre and post data were recorded at the day 1 and after the end of the intervention period.

We reviewed a few articles stating the effect of theragun and SSF, in reducing pain and improving ROM.

There was a study done by, Kshama S Shetty, A Joseph Oliver Raj - 2017 et al, they conducted a study on "Effect at SSF on myofascial trigger point of upper Trapezius muscle as compared with Manual Pressure Release" on 40 subjects study for intended to compare the effectiveness of SSF and Manual Pressure Release in Trapezius in upper trapezius muscle and concluded that SSF and Manual Pressure Release have got beneficial effect in reducing the pain intensity and increasing the ROM in patients with trapezius muscle in upper trapezius.

Another study done by, Dr. Roshni Patel, Dr. Atit Patel - 2020 et al, they conducted a study on "Effect of theragun on the improvement of back flexibility" on a subject for improvement of back flexibilty and conducted that the theragun is effective for improvement in the back flexibilty may also improve horse riding performance.

Overall, the reviews concluded that both SSF and theragun has a significant effect in reducing pain and improving flrxibilty of the joints and muscles.

The current study focuses on the effect of SSF and theragun on trapezitis patient to improve their ROM and reduce pain. The Theragun showed more significant effect then SSF, with the significant value of $p < 0.01$ for the post treatment data.

Hence, the hypothesis $H_{1[2]}$ is accepted. The study concludes significant markdown in the pain and improvement in the ROM of the side flexion of neck. As the group A and B had significant effect then group c and group A showed more significant results in increasing ROM than group B.

9. Conclusion

- The study concludes that theragun had more significant effect in the patients with trapezitis.
- The surged faradic current was also effective in the patients.
- But comparatively theragun was more significant then surged faradic current.
- Hence, the group A had most Improvement in the ROM of the side flexion of neck than group B. And group C showed no improvement.

10. Limitation

- The sample size was small.
- The study setting was limited.
- The study duration was less.
- The regular follow-up was not possible.

Conflict of interest: None

References

[1] Senthilkumar S, Kumar A, Sangeetha S. A Study on Effectiveness of Post Isometric relaxation Technique in Trapezitis among workers. Research Journal of Pharmacy and Technology. 2019;12(10):4836-40.
[2] Khare D, Pathak R. Effectiveness of elastic resistance band exercises versus conventional exercises on cases of trapezitis: A comparative study. International Journal of Orthopaedics. 2018;4(1):174-8.
[3] Chaudhary ES, Shah N, Vyas N, Khuman R, Chavda D, Nambi G. Comparative study of myofascial release and cold pack in upper trapezius spasm. International Journal of Health Sciences and Research (IJHSR). 2013 Dec;3(12):20-7.
[4] Heggannavar AB, Kulkarni PK, Naik KK, Oza AN. Compare the Effect of 50% Ramp-Up And 100% Ramp-Up Faradic Stimulation in Patients with Non-Specific Trapezius Spasm-A Randomised Clinical Trial.
[5] Sport Medicine Clinic - Downtown Toronto [Internet]. Sportmedicineclinic.com. 2020 [cited 15 December 2020].
[6] Patel R, Patel A. Effect of Theragun on the improvement of back flexibility: A case study.
[7] Heggannavar AB, Kulkarni PK, Naik KK, Oza AN. Compare the Effect of 50% Ramp-Up And 100% Ramp-Up Faradic Stimulation in Patients with Non-Specific Trapezius Spasm-A Randomised Clinical Trial.
[8] Larsson R, Öberg PÅ, Larsson SE. Changes of trapezius muscle blood flow and electromyography in chronic neck pain due to trapezius myalgia. Pain. 1999 Jan 1;79(1):45-50.
[9] Shetty KS, Raj AJ. Effect of Surged Faradic Current on Myofascial Trigger Point of Upper Trapezius Muscle as Compared with Manual Pressure Release.
[10] Nalawade AA, Patil PH. Comparison between Surged Faradic Current and Transcutaneous Electrical Nerve Stimulation (TENS) on Myofascial Trigger Points in Trapezius. Indian Journal of Physiotherapy & Occupational Therapy. 2020 Jan 1;13(1).
[11] Mane P, Pawar A, Warude T. Effect of Myofascial Release and Deep Transverse Friction Massage as an Adjunct to Conventional Physiotherapy in Case Unilateral Upper Trapezitis-Comparative Study
[12] Satardekar M, Bhoir D. ANALYSIS AND ENHANCEMENT IN THE PERFORMANCE OF ELECTRICAL MUSCLE STIMULATOR. International Journal of Engineering Sciences & Research Technology. 2017;:7.