DOI Number: 10.5958/0973-5674.2020.00002.7

Comparison between Surged Faradic Current and Transcutaneous Electrical Nerve Stimulation (TENS) on Myofascial Trigger Points in Trapezius

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Abstract

Aim: To find out the effect of surged faradic current and transcutaneous electrical nerve stimulation (TENS) on myofascial trigger points in trapezius

Materials and Method: The study was conducted in clinically diagnosed subjects with myofascial trigger points present in trapezius with age group 18-25 years. Total 34 subjects were include in the study .They were randomly devided into the two groups each consisting of 17 subjects .Group A include the subjects who received Transcutaneous electrical stimulation and phonoporeis and Group B include the subjects who received surged faradic current and phonophoresis .Pre treatment outcome measures were visual analogue scale, Cervical range of motion and palpation of myofascial trigger points present in the trapezius. The specific protocol was given to the patients for 2 weeks for 4 days .At the end of the 2 weeks, past treatment outcome measures were performed for range of motion and pain. Paired T-test was used to analyse within the group statistical analysis and unpaired t test used for between the group statistical analysis and sees the result.

Result: Paired t-test was used to analyze the comparison between surged faradic current and transcutaneous electrical nerve stimulation on mayofacial trigger points in trapezius. There result was extremely significant for group A and group B.

Between the group comparison the unpaired t-test was used to analyze group A and group B post treatment values and there was significant difference between outcome variables in VAS, ROM and Palpation .

Conclusion: From this conducted study it concluded that, patient who treated with surged faradic current and phonophoresis had significant improvement clinically and statistically and improved in Range of Motion (ROM), Visual analogue scale and showed reduction in myofascial trigger points with palpation. So, this study accepts the alternate hypothesis

Keywords: *myofascial trigger points, transcutaneous electrical nerve stimulation, surged faradic current.*

Introduction

A myofascial trigger points is a site of increased irritability in a tissue that demonstrate a hypersensitive reaction to the mechanical stimulation such as pressure or traction and triggers an additional physiological reaction.[1]

MTPs can be painful on compression and can produce characteristics effects, Such as alteration of muscle activation, increased muscle tension, restricted ROM, muscle weakness, fatigability and autonomic phenomena.[2]

MTPs are classified into two, 1) Active myofascial trigger points 2)Latent trigger points.[3]

An active myofascial trigger point which is already symptomatic at rest and/or during psychological strain (spontaneous activity) and feel tender and sensory,

motor function and or autonomic phenomena in its related transfer zones.[1]

A latent trigger points is not symptomatic at rest or during physiological strain but still demonstrates localized tenderness and causing regional motor ,sensory functions autonomic phenomenon in its related transfer zone.[1]

Another common observation is that among all the neck muscles the trapezius is most likely to have trigger points. Any overuse injury such as using a computer, hand held electronic devices, repetitive strain from lifting, poor posture, muscle tensing due to stress, traumas and injuries, prolonged bed rest and sitting causes shortening of muscles creating spasm and trigger points in the trapezius muscle.[4] Although myofascial trigger points are common, but they are frequently ignored and inadequately treated. Some of the modalities commonly used in the physiotherapeutic management of 5 trigger points include ultrasound, laser. Electrical nerve stimulation is also used to treat trigger points. Some of them include TENS, interferential current, strong surged faradic current.[5,6]

Surged faradic current is used for the improving strength and vascularity of muscle. About 90 contraction will be given in each session to avoid muscle fatigue.[7]

Phonophoresis is a therapeutic method that may be helpful for the treatment of Myofascial trigger points (MTP). Phonophoresis using hydrocortisone 1 %(Pulse mode, 1.2W/cm^2, 1 MHz, for 5 min) will be used.[8]

Transcutaneous electrical nerve stimulation has been used to treat a variety of painful acute and chronic conditions .There are four types of TENS devices used in the clinical practice,1) High frequency 2) Low frequency 3)Burst frequency 4)Hyper stimulation. For the treatment of myofascial trigger points (MTP) present in trapezius frequency ranging from 40-150 Hz with μsec pulse width.[9]Duration of transcutaneous electrical nerve stimulation is 20 min.[10]

Materials and Methodology

- An ethical clearance was taken prior to conduction of study from institutional ethical committee of KIMSDU Karad. An experimental study was conducted at Physiotherapy department of Krishna college of physiotherapy. Total 34 subjects having myofascial trigger points were selected as per inclusion and exclusion criteria of the study. Inclusion criteria was 1. Male and female having active myofascial trigger points on trapezius, 2. Age group 18-30 years. Exclusion criteria were 1. Cervical fracture 2. Scapular fracture. Total 34 subjects were include in the study. They were randomly devided into the two groups each consisting of 17 subjects. Group A include the subjects who received Transcutaneous electrical stimulation and phonoporeis and Group B include the subjects who received surged faradic current and phonophoresis .All the participant had myofascial trigger points on trapezius. Written informed consent was taken from the subjects and whole study was explained to them. Pre and post assessment for visual analogue scale (VAS), cervical range of motion and Palpation of myofascial trigger points (MTP) present in the trapezius was used to assess the subjects. The interpretation of the study was done on the basis of comparison between pre test and post test assessment.

- **MATERIAL USED:** VAS Scale, Universal Goniometer.

- **RESULTS/FINDINGS:**

OUTCOME MEASURES:

VISUAL ANLOUGE SCALE

- **WITH IN THE GROUP**

➢ **GROUP A**

1.) **Visual Analogue Scale(VAS)**

VAS(At Rest)	**Pre interventional**	**Post interventional**	**VAS(On Activity)**	**Pre interventional**	**Post interventional**
Mean ±SD	5.05±0.658	4.23±0.664	**Mean ±SD**	6.82±0.727	5.11±0.857
N	17	17	**N**	17	17
DOF	16	16	**DOF**	16	16
T Value	8.641	8.641	**T Value**	10.253	10.253
P value	<0.0001(Extremely significant)	<0.0001(Extremely significant)	**P value**	<0.0001(ES)	<0.0001(ES)

Table no.1 Mean of Pre and Post VAS at rest and on activity.

2) Range of motion (ROM)

- **Cervical flexion** , **Cervical Extension**, **Cervical side flexion** and **Cervical Rotation**:

	Cervical flexion		**Cervical Extension**		**Cervical side flexion**		**Cervical Rotation**	
	Pre interventional	**Post inter-ventional**	**Pre interventional**	**Post interve-ntional**	**Pre interven-tional**	**Post interven-tional**	**Pre interve-ntional**	**Post interve-ntional**
Mean ±SD	50.88 ± 4.608	60.70± 3.601	50.76 ± 4.323	60.52 ± 3.939	38.94 ± 4.085	44.52± 2.918	52.00 ± 5.000	59.82±4.531
N	17	17	17	17	17	17	17	17
DOF	16	16	16	16	16	16	16	16
T	12.196		9.967		10.170		8.286	
P	<0.0001(Extremely significant)		<0.0001(Extremely significant)		<0.0001(Extremely significant)		<0.0001(Extremely significant)	

Table no.2 Mean of Pre and Post ROM Cervical flexion ,Cervical Extension , Cervical side flexion and **Cervical Rotation**.

3) **8Palpation**

There was 17 subjects in group A having Mayofascial trigger points present pre interventionally and post interventionally it was 7 this shows reduction in mayofascial trigger points on trapezius. **.**

- **GROUP B**

1) **Visual Analogue Scale(VAS)**

2) **VAS(At Rest)**	**Pre interventional**	**Post interventional**	**VAS(On Activity)**	**Pre interventional**	**Post interventional**
Mean ±SD	4.4±0.93911	2.764±0.970	**Mean ±SD**	6.35±0.996	3.70±1.047
N	17	17	**N**	17	17
DOF	16	16	**DOF**	16	16
T Value	8.641	8.641	**T Value**	13.887	13.887
P value	<0.0001(ES)	<0.0001(ES)	**P value**	<0.0001(ES)	<0.0001(ES)

Table no.3 Mean of Pre and Post VAS at rest and on activity.

2) Range of motion

- **Cervical flexion** , **Cervical Extension**, **Cervical side flexion** and **Cervical Rotation**:

	Cervical flexion		**Cervical Extension**		**Cervical side flexion**		**Cervical Rotation**	
	Pre interventional	**Post interventional**	**Pre interventional**	**Post interventional**	**Pre interventional**	**Post interventional**	**Pre intervention al**	**Post interventional**
Mean ±SD	49.76 ± 3.437	63.82± 2.811	50.64 ± 4.623	64.64 ± 2.206	39.00 ± 3.674	49.00± 3.062	54.05 ± 4.069	62.47±3.923
N	17	17	17	17	17	17	17	17
DOF	16	16	16	16	16	16	16	16
T	13.688		9.967		11.603		8.286	
P	<0.0001(Extremely significant)		<0.0001(Extremely significant)		<0.0001(Extremely significant)		<0.0001(Extremely significant)	

Table no.4 Mean of Pre and Post ROM Cervical flexion ,Cervical Extension , Cervical side flexion and Cervical Rotation.

3) Palpation

There was 17 subjects in group A having Mayofascial trigger points present pre interventionally and post interventionally it was 2 this shows reduction in mayofascial trigger points on trapezius.

BETWEEN THE GROUP

1)VAS (At rest) and VAS(On activity)

Parameter	**Group A**	**Group B**	**P value**	**T value**
VAS(At rest)	4.23±0.664	2.76±0.971	<0.0001(ES)	5.157
VAS(On activity)	5.11±0.857	3.70±1.047	0.0001(CES)	4.302

Table no.5 . Mean of post values of group A and group B for visual analogue scale (VAS) at rest and on activity.

ES-Extremely Significant CES-Considered Extremely Significant

3) **RANGE OF MOTION**

➢ **Cervical flexion and cervical extension**

Parameter	**Group A**	**Group B**	**P value**	**T value**
Cervical Flexion	60.70±3.601	63.80±20811	0.0083(CVS)	2.813
Cervical Extension	60.52±3.979	64.64±2.206	0.007(CVS)	3.761
Cervical side flexion	44.52±2.918	49.00±3.062	0.001(CES)	4.358
Cervical rotation	59.82±4.531	64.47±2.778	0.0011(CVS)	3.602

Table no.6 . Mean of post values of group A and group B cervical flexion,cervical extension,cervical side flexion and cervical rotation range of motion (ROM) .

CVS-Considered Very Significant

4) **Palpation**

In palpation out of 17 subjects in group A 10 subjects were found with reduction of myofascial trigger points and in group B 15 subjects were found with reduction of myofascial trigger points.

Discussion

The purpose of the study to find out Comparison between surged faradic current and transcutaneous electrical nerve stimulation (TENS) on myofascial trigger points in trapezius .

The objectives of this study were to determine the effect of surged faradic current on myofascial trigger points in trapezius, to determine the effect of transcutaneous electrical nerve stimulation (TENS)on myofascial trigger points in trapezius and to determine the comparison between surged faradic current and transcutaneous electrical nerve stimulation myofascial trigger points in trapezius.

The study was conducted on clinically diagnosed subjects with myofascial trigger points present on trapezius with age group 18-25 years. Total 34 subjects were include in the study .They were randomly devided into the two groups each included 17 subjects .Group A include the subjects who received Transcutaneous electrical stimulation and phonoporeis and Group B include the subjects who received surged faradic current and phonophoresis .All the participant had myofascial trigger points present on trapezius. Pre treatment outcome measures were visual analogue scale, Cervical range of motion and palpation of myofascial trigger points .The specific protocol was given to the patients for 2 weeks for 4 days .At the end of the 2 weeks, past treatment outcome measures were performed for range of motion and pain. Paired T-test was used for within the group statistical analysis and unpaired t test used for between the group statistical analysis and sees the result.

The average mean age of participants in Group A was 21.64 ± 1.869 and group B was 20.82 ±1.741, which showed their is no significant difference in age of subjects in both groups(t= 1.330, p=o.1931) which was down by unpaired t-test.

➢ Within the group statistical analysis

In group A pre interventional Mean and SD of VAS at rest was 5.05±0.658 and post interventional Mean and SD of VAS at rest was 4.23±0.664. The P value was <0.0001 which is statistically extremely significant (t=8.641) this shows improvement in visual analogue scale (VAS) at rest.

The pre interventional Mean and SD of VAS on activity was 6.82±0.727 and post interventional Mean and SD of VAS on activity was 5.11±0.857. The P value was <0.0001 which is statistically extremely significant (t=10.253) this shows improvement in visual analogue scale (VAS) on activity

The pre interventional Mean and SD of cervical flexion ROM was 50.88 ± 4.608 and post interventional

Mean and SD of cervical flexion ROM was 60.70± 3.601. The P value was <0.0001 which is statistically extremely significant (t=12.196) this shows improvement in cervical flexion ROM. .

The pre interventional Mean and SD of cervical Extension ROM was 50.76 ± 4.323 and post interventional Mean and SD of cervical Extension ROM was 60.52 ± 3.939. The P value was <0.0001 which is statistically extremely significant (t=9.967) this shows improvement in cervical Extension ROM .

The pre interventional mean and SD of cervical side flexion ROM was 39.00 ± 3.674 and post interventional mean and SD of cervical side flexion ROM was 49.00± 3.062. The P value was <0.0001 which is statistically extremely significant (t=8.505) this shows improvement cervical side flexion ROM.

The pre interventional Mean and SD of cervical rotation ROM was 54.05 ± 4.069 and post interventional Mean and SD of cervical rotation ROM was 62.47±3.923. The P value was <0.0001 which is statistically extremely significant (t=28.150) this shows improvement in cervical rotation ROM .

There was 17 subjects in group A having MTPs present pre interventionally and post interventionally it was 7 this shows reduction in MTPs on trapezius.

In group B the pre interventional Mean and SD of VAS at rest was 4.4±0.93911 and post interventional Mean and SD of VAS at rest was 2.764±0.970. The P value was <0.0001 which is statistically **extremely significant** (t=8.641) this shows improvement in VAS at rest.

The pre interventional Mean and SD of VAS on activity was 6.35±0.996 and post interventional Mean and SD of VAS on activity was 3.70±1.047. The P value was <0.0001 which is statistically **extremely significant** (t=13.887) this shows improvement in VAS on activity.

The pre interventional Mean and SD of cervical flexion ROM was 49.76 ± 3.437 and post interventional Mean and SD of cervical flexion ROM was 63.82± 2.811 . The P value was <0.0001 which is statistically extremely significant (t=13.688) this shows improvement in cervical flexion ROM.

The pre interventional Mean and SD of cervical Extension ROM was 50.64 ± 4.623 and post interventional Mean and SD of cervical Extension ROM was 64.64 ± 2.206. The P value was <0.0001 which is statistically extremely significant (t=11.603) this shows improvement in cervical Extension ROM**.** The pre interventional Mean and SD of cervical side flexion ROM was 39.00 ± 3.674 and post interventional Mean and SD of cervical side flexion ROM was 49.00± 3.062. The P value was <0.0001 which is statistically extremely significant (t=8.505) this shows improvement cervical side flexion range of motion.

The pre interventional Mean and SD of cervical rotation range of motion was 54.05 ± 4.069 and post interventional Mean and SD of cervical rotation range of motion was 62.47±3.923. The P value was <0.0001 which is statistically extremely significant (t=28.150) this shows improvement in cervical rotation range of motion.

There was 17 subjects in group A having MTPs present pre interventionally and post interventionally it was 2 this shows reduction in MTPs on trapezius.

Paired t-test was used to analyze the comparison between surged faradic current and transcutaneous electrical nerve stimulation(TENS) on mayofacial trigger points in trapezius. There result was extremely significant for group A and group B.

For Between the group comparison the unpaired t-test was used to analyze group A and group B post treatment values and there was significant difference between outcome variables in VAS at rest(P=5.157),VAS on activity(P=4.302), range of motion and Palpation .Following are the p values which leads to analyse improvement in cervical flexion(P=0.0083),cervical extension(P=0.007),cervical side flexion(P=0.001) and cervical rotation(P=0.0011).In palpation out of 17 subjects in group A 10 subjects were found with reduction of myofascial trigger points and in group B 15 subjects were found with reduction of myofascial trigger points

The result from the statistical analysis of present study support the alternative hypothesis which stated that there will be benifical effect to the subject treated with surged faradic current than the transcutnaneous electrical nerve stimulation (TENS).

Hence above result showed that group B subjects treated with surged faradic current on myofascial trigger points in trapezius.

Conclusion

From the above conducted study it concluded that, patient who treated with surged faradic current and phonophoresis had significant improvement clinically and statistically and improved in Range of Motion (ROM), Visual analogue scale (VAS) and showed reduction in myofascial trigger points (MTP) with palpation. So, this study accepts the alternate hypothesis.

Conflict of Interest: The authors declare that there are no conflict of interest concerning that content of present study.

Source of Funding: Self-Funded

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