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# Comparison of Ultra Sound Therapy & Transcutaneous Electrical Nerve Stimulation in the Treatment of Upper Trapezitis

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**Abstract: Aim**: To compare the effectiveness of ultrasound and transcutaneous electricalnervestimulation in treatment ofupper trapezitis.**Objective**:Todeterminethe effectivenessofultrasoundtherapyinupper trapezitis. **Method**: Using convenient sampling method (as the patient comes the odd numberwill be allotted to Group-A and even number will be allotted to Group-B by theresearchsupervisor)thirtysampleswithupper trapezitiswillbeselectedbasedoninclusion and exclusion criteria. Informed consent will be obtained from all theparticipants. All participants will undergo trigger point assessment byultra-sonogram and their pain will be measured in Numerical pain rating scale(NPRS). Participants will be assigned into two groups 15 numbersin eachrandomly. OutcomeMeasures: AssessmentofTriggerPointusingUltra sonogram. NumericalPainRatingScale(NPRS)forquantifyingpain. **StatisticalAnalysis**:The collected data was tabulated and analyzed using descriptive and inferentialstatistics .To all parameters, mean and standard deviationwas used. Paired t-testwasusedtoanalyzesignificantchangesbetweenpre-testmeasurements.Unpairedt-testwasused to analyzesignificantchangesbetween two groups.**Result**:StatisticalAnalysisshowsthatinterventionofUltrasoundTherapyinmoresignificantthanTranscutaneousElectricalNerveStimulationintreatingbyreducingUpper trapezius trigger point andreducingpain, Conclusion: From the results , it has been conclude that ultrasound therapy [group A] are moreeffectivethanTranscutaneousElectricalNerveStimulation[groupB]indecreasingpain and trigger point

**Keywords:** Upper Trapezitis, Ultra sound Therapy, TENS, Trigger Point, Myofascial pain

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**Introduction**: Trapeziusisoneoftwolargesuperficialmusclesthatextendlongitudinally from the occipital bone to the lower thoracic vertebrae andlaterally to spine of scapula. Its functions are to move scapulae and support thearm .The trapezius has three functional regions: descending, ascending andmiddle .The muscle contribute to Scapulo humeral rhythm through attachmenton clavicle and scapula, and to head balance through muscular control ofcervicalspine Origin:Themuscleattachestothemedialthirdofthesuperiornuchalline,externaloccipitalprotuberance, nuchalligamentandspinoutsprocessesofC7-T12vertebrae.

Insertion:Themuscleinsertsonthelateralthird of clavicle, acromion and spine of scapula. Nerve supply: Spinal root ofaccessorynerveandcervical nerves C3&C4.BloodSupply:Transversecervicalartery. Thetrapezius commonly contains trigger points, and referred painfromtriggerpointsbringpatienttoofficemoreoftenthanforanyotherproblem.Symptoms:headache onthetemples/tension,painbehindtheeyes,stiffneck,limitedrange ofmotion,intoleranceto weightonyourshoulderNeck pain has been the most common chief complaint amongworking men and women. Working postures with the neck in extreme flexionincrease the load moment three to four times on the neck causing spasm of theneck muscles. Also working tasks that involve continuous arm movementsalwaysgenerateastaticloadcomponentonthesemuscles;theprincipalmuscle to carry this load is the trapezius. For people who work at desks andcomputers, or who spend many hours driving, the upper trapezius becomesverysore and painful. Abouttwothirdsofpeopleexperienceneckpainatsomepoint in their lives. Neck pain prevalence varies widely in different studies,with a mean point prevalence of 13 % (range 5.9% – 38.7 %) and meanlifetimeprevalenceof 50%(range14.2%– 71.0%).Trapezitis is an inflammation of trapezius muscle which involvesMyofascialpainsyndrome.Musclespasmoccursearly afterinflammation.This feels like tightness in the muscles and is sometimes painful. When basicinjury is not treated, spasm causes formation of muscle knots, called triggerpoints.The knotsform because the spasmkeepsthe muscle continuously“on”. As muscles are not designed for this continuous work, over a period themuscle gets overloaded and forms these knots. As a result, treatment of thespasm is necessary to reduce this problem. The Myofascial trigger point in thetrapezius is most commonly found at the midpoint of the upper border of themuscle.Triggerpoints(TrP’s)aretypicallylocatedbypalpation.Simons described criteria for identification of taut band - a tender spot on thetaut band, referred pain or altered sensation at least 2 cm beyond the spot,elicited by needle penetration or pressure held for 10 seconds; and restrictedROMinthejoint,themusclecrosses.Someauthorscontendthatwhenpressure is applied to

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TrP's, a "jump sign" is elicited or patient reacts withfacialgrimacingor verbal response. Two main types of trigger points are described: active and latent.Active trigger points are those that may be responsible for the presenting paincomplaint. They may also be associated with less readily definable symptomssuch as weakness, parenthesis, or temperature changes, and they reproducespontaneous pain. Latent trigger points present with muscle shortening andpain occurs only on the application of external pressure. These trigger pointsmay become activated by a variety of stimuli, including poor posture, overuse,ormuscleimbalance. Fascia is a tough connective tissue which spreads throughout thebodyinathree-dimensionalwebform,fromheadtotoe.Thefasciaisubiquitous, surrounding every muscle, bone, nerve, blood vessel and organ allthewaydown to the cellularlevel. Tightening of the facial system is a histologic and physiologicand bio mechanic protective mechanism that is a response to trauma. Thefascia loses its pliability, becomes restricted and is a source of tension to therest of body. The ground substance solidifies, the collagen becomes dense andfibrous and the elastin loses its resiliency. Over time this can lead to poormuscular biomechanics, altered structural alignment and decreased strength,endurance. Ultrasound was originally introduced into physiotherapy asan alternative diathermy technique. Its main use has been in the treatment ofsoft tissue injuries, It has been demonstrated both in the laboratory, and inclinical trials that ultrasound can stimulate tissue repair and wound healing ifcorrectlyapplied.Ultrasoundhasbeenshowntoenhancecollagensynthesisbyfibroblasts.
Ischemiccompression, s t r e t c h ofuppertrapeziusmuscle, transverse friction massage are manual techniques to help patients with TM.These manual therapy upper to have instant improvement on pain . Ischemiccompressionand dryneedlingcan both berecommended.

**Procedure**: 30 Sample were selected from Physiotherapyoutpatient department Saveetha medical college and hospital, accordingtotheinclusion andexclusion criteria. InclusionCriteria were subjects with Palpabletrigger Pointin uppertrapezius muscle and PositiveJump Sign and subjects with CervicalRadiculopathy andPainabove8 in NPRSwere excluded from this study.Using convenient sampling method (as the patient comes the odd numberwill be allotted to Group-A and even number will be allotted to Group-B by theresearch supervisor) thirty samples with upper trapezitis will be selected based oninclusion and exclusion criteria. Informed consent will be obtained from all theparticipants. All participants will undergo trigger point assessment byultra-sonogram and their pain will be measured in Numerical pain rating scale(NPRS). Participants will be assigned into two groups 15 numbersin eachrandomlyGroupA:(n=15): Ultrasoundtherapy:

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Patient will be made to sit in a well-supported chair &lean forward in a comfortable manner. His/her head & arms will be supportedwithpillow.Ultrasoundwillbegivenonthetrapezialtriggerpoints.5days/weekforoneweek**.** TreatmentProtocol:Frequency -3 MHZIntensity-1.0 $Wcm^2$Duration-10minutes**.** Aftergivingtreatmentwiththemodalitysubjectisassessedforthereductionofinflammation byusingultra sonogram attheend ofoneweek**.** GroupB:(n=15): TENS: Patient will be made to sit in a well-supported chair & lean forward in acomfortable manner. His/her head & arms will be supported with pillow. TENSwillbegiven onthetrapezial trigger points.5days/weekfor oneweek.TreatmentProtocol:Frequency:100-150HzPulse width: 100 and 500 msDuration: 10 minutes. Aftergivingtreatmentwiththemodalitysubjectisassessedforthereductionofinflammation byusing ultra sonogram atthe endof oneweek. **AssessmentofTriggerPointusingUltra sonogram**: Outcomemeasureswillbetakenbeforeinterventionandafteroneweekoftreatment and considered as pre and post values. Statistically analyzed, results willbeobtained. Ultra sonogram:Eachparticipant willunderg oUS examinationafter oneweek oftreatment. The upper trapezius will be visualized in longitudinal and transverse views withthe subject sitting upright in a comfortable position.

| TissueImagingScore | |
|---|---|
| Score | Criterion |
| 0 | Nofocallesiononechoorstiffnessimageincludesheterogeneity) |
| 1 | Evidenceof focallesiononbothechoandstiffnessImage |
| 2 | Multiplefocallesionsormarkedheterogeneityonbothechoand stiffnessimage |

**StatisticalAnalysis:**Thecollecteddatawastabulatedandanalyzedusingdescriptiveandinferential statistics. To all parameters mean and standard deviation wereused .Paired t-test was used to analyze significant change between pre-testand post –test measurements. Unpaired t-test was used analyze significantbetweentwogroups.

Table-1: Pretest–Posttest valuesofgroup–AofNPRS &TriggerpointAssessment

| GroupAs | Test | Mean | Standarddeviation(SD) | T value | Pvalue |
|---|---|---|---|---|---|

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| | | | | | |
|---|---|---|---|---|---|
| NPRS | Pretest | 6.00 | 0.85 | 12.2202 | Less than0.0001 |
| | Posttest | 2.60 | 0.85 | | |
| Trigger pointassessment | Pretest | 1.907 | 0.24 | 11.267 | Less than0.0001 |
| | Posttest | 1.107 | 0.13 | | |

The pre-test value of NPRS is 6.00 (SD is 0.85) and post-test mean value is 2.60(SD is 0.85) this shows that NPRS scores are gradually increased, with P value(<0.0001)extremelystatisticallysignificant.

The pre-test mean value of trigger point assessment is 1.907(SD is 0.24) and post-test mean value is 1.107 (SD is 0.13) this trigger pointare gradually decreased,with Pvalue (<0.0001)extremelystatisticallysignificant.

Table-2: Pretest –Posttest values of group –B of NPRS & Trigger pointassessment

| GroupB | Test | Mean | Standarddeviation(SD) | T value | Pvalue |
|---|---|---|---|---|---|
| NPRS | Pretest | 6.00 | 0.85 | 13.114 | Less than0.0001 |
| | Posttest | 3.0 | 0.47 | | |
| Trigger pointassessment | Pretest | 1.387 | 0.21 | 12.441 | Less than0.0001 |
| | Posttest | 0.860 | 0.11 | | |

The pre-test value of NPRS is 6.00 (SD is 0.85) and post-test mean value is 3.0(SD is 0.47 ) this

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shows that NPRS scores are gradually increased, with P value(<0.0001)extremelystatisticallysignificant.

The pre-test mean value of trigger point assessment is 1.387(SD is 0.21) and post-test mean value is 0.860 (SD is 0.11) this trigger pointare gradually decreased,with Pvalue (<0.0001)extremelystatisticallysignificant.

Table–3: Comparisonbetweenthepostestvaluesgroup Aand groupB.

| Group A | Test | Mean | Standarddeviation(SD) | Tvalue | P value |
|---|---|---|---|---|---|
| NPRS | Posttest Group-A | 2.6 | 0.86 | 2.3 | less than0.0001 |
| | Posttest Group-B | 3.0 | 0.21 | | |
| Trigger pointassessment | Post testGroup-A | 1.107 | 0.1335 | 5.232 | less than0.0001 |
| | Post testGroup-B | 0.860 | 0.21 | | |

**Result**: Statistical Analysis shows that intervention of Ultrasound Therapy in moresignificant than Transcutaneous Electrical Nerve Stimulationin treating byreducingUpper trapezius trigger point andreducingpain.

**Discussion**: Neck pain has been the most common chief complaint among working men andwomen. Working postures with the neck in extreme flexion increase the loadmoment three to four times on the neck causing spasm of the neck muscles. Alsoworking tasks that involve continuous arm movements always generate a staticload component on these muscles; the principal muscle to carry this load is thetrapezius.Trapezitisisaninflammationoftrapeziusmusclewhichinvolvesmyofascial pain syndrome. Muscle spasm occurs early after inflammation. Thisfeels like tightness in the muscles and is sometimes painful. When basic injury isnot treated, spasm causes formation of muscle

knots, called trigger points. Theknots form because thespasm keeps the musclecontinuously “on”. Asmusclesarenotdesignedforthiscontinuouswork,overaperiodthemusclegetsoverloaded and forms these knots. As a result, treatment of the spasm is necessarytoreducethis problemin the study, the subjects were chosen from 18 to 40 years. The dataobtained from the study was statistically analyzed using paired and unpaired t-test.The result of the study reveal that there was reduce in trigger point assessed byultra-sonogram an decrease in pain by NPRS in both Groups, A and B after therespective protocol.Thereduce of painandtrigger pointsingroupAwhichreceived Ultrasound therapy was more significant than group B which receivedTENS. Hence, the result of this study proves that, there will be beneficial effect ofUltrasoundtherapyin treatment of Upper trapezitis.The main significance of this study is outcome of the triggerpoint was measured by Diagnostic Ultra sonogram. And thedisadvantageiswelimitwithjustmeasuringthelengthofthetaughtband which was hypo echoic in ultrasound instead of measuring thearea of the taught band. This shall be considered as recommendationfutureresearches.

**Conclusion**:

Fromtheresults,ithasbeenconcludedthatUltrasoundtherapyismoreeffectiveindecreasingtrigger point and pain in upper trapezitis.

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