IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

EFFICACY OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION ON ROTATOR CUFF RELATED CONDITIONS

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ABSTRACT

Rotator cuff disease is a common cause of shoulder pain and disability. This literature review assessed the efficacy of transcutaneous electrical nerve stimulation (TENS) for treating rotator cuff related conditions. Three randomized controlled trials published between 2016-2020 were included. Results showed TENS therapy combined with standard treatment has a greater impact on reducing pain and disability than standard treatment alone. One trial found patients recieving TENS had significantly lower pain scores and 25% less opioid use after rotator cuff repair surgery compared to placebo TENS. However, the quality of evidence overall is poor. practitioners should communicate the uncertainity of treatment effects and consider other approaches. Further high quality trials are needed to determine if TENS improve outcomes for patients with rotator cuff disease. This review cocludes TENS may provide short-term pain relief and should be used alongside exercise and manual therapy, but long-term impacts are unknown.

key words:Transcutaneous electrical nerve stimulation, Rotator cuff muscles, Rotator cuff related conditions.

I. INTRODUCTION

Rotator cuff disease is a broad term that refers to rotator cuff disorders, and it is the most common cause of shoulder pain[1]. Rotator cuff pathology is the leading cause of shoulder disability seen by orthopaedic surgeons [6]. People with rotator cuff related conditions frequently report that their pain is worse at night and is exacerbated by movement in specific directions, such as overhead activities[3]. Athletes are particularly susceptible to o veruse tears ,especially in the context of repetitive microtrauma ,as seen in tennis players. Rotator cuff disease is most likely multifactorial,with both intrinsic and extrinsic factors contributing[7]. Electrotherapy modalities ,which aim to reduce pain and improve function by incresing energy in the body, may be used to treat rotator cuff disease. Therapeutic ultrasound, low level laser therapy, TENS, and pulsed electromagnetic field therapy are a few examples. These modalities are typically provided as part of a physical therapy intervention[3].

Among various musculoskeletal problems, shoulder pain is the leading cause of disability and distress. After back and neck pain, shoulder pain ranked third among musculoskeletal illnesses. Different studies report a prevalence range of 6.9 - 2.6% ,a lifespan prevalance range of 6.7 to 66.7%,and a incidence range of 0.9 -2.5%. The prevalence was highest between the ages of 40 and 50[2].

Rotator cuff is made up for four muscles, the supraspinatus, infraspinatus, subscapularis, and teres minor. along with the deltoid muscle, the supraspinatus contributes to shoulder abduction.The infraspinatus and teres minor muscles rotates the humerus externally, while the subscapularis muscle rotates the humerus internally[7]. The rotator cuff muscles stabilize the shoulder joints and counterbalance the force of other shoulder muscles, most notably the deltoid[7].

Transcutaneous electrical nerve stimulation therapy is one such electrical energy-based treatment method .It is a common modality used by physiotherapists to manage muscle and bone pain[1]. It is a nonpharmacological intervention that activates a complex neuronal network to reduce pain by activating the CNS descending inhibitory system to reduce hyperalgesia[9]. A pulse generator generates electrical stimuli during TENS therapy. Using electrodes, the stimulus is then delivered through the intact skin. TENS employ a variety of techniques. The most common types of TENS therapy are conventional TENS therapy, acupuncture -like TENS therapy, and intense TENS therapy[1]. Clinical effectiveness of TENS is controversial and easy to apply with relatively few contraindication[5]. The author of this review made no conclusions about the effectiveness of TENS for shoulder pain. However, specifically assess the therapeutic effects of TENS for rotator cuff related conditions.As a result, a synthesis of the currently available evidence on the efficacy of TENS in the rehabilitation of individuals with rotator cuff related conditions is required. The goal of this review was to assess the available evidence regarding the effect of TENS for the treatment of rotator cuff related conditions. The purpose of a literature review is to understanding the effect of TENS on rotator cuff related conditions from the existing research and to present the knowledge in the form of a written report. The need of the study is there is no relevant studies regarding this subject. It can be very helpful in further studies. It focus on whether the TENS therapy is effective for rotator cuff related conditions or not.

II. METHODOLOGY

Researching the effect of TENS therapy on rotator cuff related conditions, data has been collected from google scholar and pubmed. The inclusion criteria in this study were as follows: Randomized controlled trial, systematic review published between 2016 to 2020, studies included patients with TENS as a treatment protocol, articles published in english, articles are freely available. The primary exclusion criteria included studies were excluded other than english, articles published before 2016, article without full text accessibility, animal studies.

SL.NO	AUTHOR NAME,YEAR,TITLE OF JOURNAL	METHODOLOGY	RESULT	CONCLUSION
1.	Mrs.Pushpa rani Dr.Vsantha Kalyani, Effect of TENS therapy on pain and functional disability level among patients with rotator cuff disease ;A Randomized controlled Trial [13 february 2020]	There were 38 people in experimental group and 38 people in control group.The rotator cuff patient was chosen using a consecutive non probability sampling technique.TENS therapy stimulation was delivered in the conventional mode,which is high frequency 100 HZ current.For 20 minuits at a pulse duration of 120 and low intensity (30-40 mA).This therapy was administered once a day for 5 days in a row.The intervention was carried out on the subjects by the primary researcher.Primary investigator demonstrated shoulder ROM excercises.The patient performed the excercises twice a day,in the morning and evening at their homes.The outcomes were evaluated using a standardized SPADI sacale.	The results show that both groups were homogenous in terms of pain duration, previuous treatment history,site of involvement,dominant arm and comorbidity.The effect of TENS therapy on pain level among subjects ,there is a significant reduction in pain score of patients in the experimental groups from pre test to post test.When compared to the control group,patients with rotator cuff disease in th intervention group had a significant reduction in disability score	Significant impact on pain and functional disability level among patients with rotator cuff disease in the control group,but TENS therapy combined with standard treatment has a greater impact on pain and functional disability level among patients with rotator cuff disease than the control group.It should be used as an adjunctive therapy alongside standard treatment in patient with rotator cuff disease to improve outcomes.
2.	Siddhart A.Mahure Andrew S .Rokitu TENS for post operative pain relief after	The senior authors identified all patients who undervent ARCR for a full thickness rotator cuff tear.Patients with a	In total,37 patients [21 active ,16 placebo].were included in the final analysis.There were no differences	Postoperative double blinded randomized trial results show that ,when compared to placebo TENS ,active TENS

	arthroscopic rotator cuff repair; A prospective double blinded randomized trial(september 2019)	history of recent narcotic use or prior narcotic abuse, As well as those under the care of a pain control specialist,were excluded from the study.Patients were randomly assigned to one of two groups;Active or placebo TENS,and they used the device 4 times per day for 45 minuits each during the first postoperative week.Percocet 5/325 mg was given to each patient as a pain reliever.The groups one week narcotic consumption and pain score on the visual analog scale were compared.	between groups.Patients in the active group had significantly lower pain scores at one week postoperatively [3.6 2.1 vs .5.8 1.2;p=.008].Postoperative percocet consumption was significantly lower in the active group during the first 48 hours [12.8 vs 17.2 6.3 ;p=.020]and the first week [25.2 9.9 vs 33.8 14.3;p=.037].	significantly reduce opioid use by more than 25% 48 hrs and 1 week after ARCR ,with statistically significant reduction in pain scores during the same time period.The findings suggest that TENS therapy could be useful in a multimodal approach to improving the patients analgesia following arthroscopic shoulder surgery .continued research in to long term functional.

3.	Matthew j page,Sally green ,Marshall A Mrocki Electrotherapy modalities for rotator cuff disease;cochrane database of systematic Review [2016].	Included RCTs and quasirandomised trials comparing any electrotherapy modality to placebo ,no intervention, a different electrotherapy modality , or any other intervention (eg; glucocorticoid injection)in adults withrotator cuff disease(eg:subacromial impingement syndrome ,rotator cuff tendinitis ,calcific tendinitis) .The main comparisons of interest were trials examining whether electrotherapy modalities were more effective than placebo or no treatment ,or whether they were an effective addition to another physical therapy intervention(e.g ,manual therapy or exercises).over all pain,function,pain on motion ,patient reported global assessment of treatment success ,quality of life ,and the number of participants experiencing adverse events were the main outcomes of interest.	47 trials(2388 participants)were included people with rotator cuff disease but no calcification.sixteen trials looked into the effect of an electrotherapy modality delivered alone.only 23% were rated as having a low risk of allocation bias,while 49% were rated as having a low risk of both performance and detection bias .because the trials differed in terms of population,intervention and comparator,no data could be combined in a metanalysis.Because of very low quality evidence from a single trial,we are unsure whether TENS is more or less effective than glucocorticoid injection in terms of pain,function,global treatment success,and active range of motion.	Because of the poor quality of the evidence,we cannot say whether TENS is superior to placebo or whether any electrotherapy modality outperforms other active interventions.(e.g glucocorticoid injection).practitioners should communicate the uncertainity of these effects and consider other treatment approaches or combinations.Further trials of electrotherapy modalities for rotator cuff disease shoulde be based on a strong rationale and consideration of whether they would change the conclusion of this review

III. DISCUSSION

TENS therapy is the most commonly used electrotherapy modality in patients with rotator cuff related conditions, compared to other physical therapy interventions. There is insufficient study on the most effective form of TENS for the rotator cuff related conditions. Our findings revealed that pain intensity was significantly reduced on the SPADI scale among TENS therapy participants. Mrs Pushparani's randomised control study looked at the effect of TENS on pain and functional disability in patients with rotator cuff disease. The findings revealed a significant decresease in pain on the SPADI score. After the intervention, subjects in the experimental groups had significantly lower pain, functional disability, and total SPADI scores than control group.

Another randomised control study by Siddharth.A.Mahure looked at the effect of TENS therapy on postoperative pain relief in patients undergoing Arthroscopic rotator cuff repair of a full thickness rotator cuff tear. The findings revealed that, when compared to placebo TENS, active TENS resulted in significantly less pain and lower opioid use in immediate postoperative pain. TENS therapy is effective in multimodal approach to improving patients analgesia following Arthroscopic shoulder surgery. Effect of electrotherapy modalities for rotator cuff diseasewa another study conducted by Mathew.j.page. In this study, it is unclear whether TENS is superior to placebo or whether any electrotherapy modality outperforms other active interventions.

Despite the fact that study provided important valuable findings that have been added to the literature and can be useful in reducing pain and functional disability among patients with rotator cuff related conditions.

IV. CONCLUSION

This review concludes that TENS therapy has a significant impact on reducing pain and functional disability in patients with rotator cuff related conditions.As a result ,it should be used as an adjunctive therapy alongside standard treatment to improve outcomes in patients with rotator cuff tear,rotator cuff injury,rotator cuff tendinitis,rotator cuff related shoulder pain.The therapy has the effect of relieving pain and increasing overall function in the affected area.To achieve the best results,this treatment should be combined with other form of therapy such as exercise and manual therapy.

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