Original Article

Compare the Effectiveness of Interferential Therapy with Mckenzie Versus TENS With Mckenzie to Reduce Low Back Pain

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Abstract

Background: Low back pain is not an illness but rather a collection of symptoms that are typically acute and self-limiting. It has an impact on work performance and general wellbeing. The most commonly used modalities of LBP are Interferential therapy and TENS. Hence this research work is done to check the effectiveness of IFT with McKenzie and TENS with McKenzie for reducing low back pain.

Purpose: To compare the effectiveness of IFT and TENS combined with McKenzie to reduce low back pain.

Materials and Methods: 60 subjects were selected based on selection criteria.. The subjects were assessed using VAS and OSWESTRY Low back pain disability questionnaires . The subjects selected were divided into two groups. IFT group(n=30) received IFT for 20 minutes per day combined with McKenzie exercises TENS group (n= 30) received TENS for 20 minutes per day combined with McKenzie exercises. These interventions were given for 4 days per week for 2 weeks. Study period: October 2022 to July 2023.

Result: The pretest and posttest values were analyzed and results suggest that the IFT group has significant improvement when compared with the TENS group with p value <0.0001.

Conclusion: The study concludes that the IFT with McKenzie and TENS with McKenzie is effective for patients with low back pain but IFT with McKenzie seems to be more effective than TENS with McKenzie.

Keywords: Low back pain IFT, TENS, McKenzie, VAS, OSWESTRY Low back pain disability questionnaire.

Introduction

Low back pain is commonly defined as tension of muscle or tightness below the costal margin. Pain and disability are the most common symptoms of low back pain without specific pathology.[1] Low back pain may either be nonspecific or mechanical Mechanical low back pain emerges from spine, intervertebral disc or around soft tissues in the spine.[2] Low back pain is commonly associated with anxiety, depression, and whole-body vibration. It is the leading cause of activity restriction[3] The global annual incidence of LBP in adults is estimated to be 15%, with a point prevalence of 30%. Men and women are both affected by LBP.[4] Postural low back pain has a notable impact on

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public and occupational health particularly in the information technology.[5] Low back pain affects one's on QOL and reduces productivity at work.[6] Low back pain is higher in prevalence in teachers due to prolonged period of standing and sitting. LBP is not an illness, its a collection of Symptoms that are typically acute and self limiting.[7] Back pain caused by a specific pathology, such as compression of nerve, fracture of vertebra, tumor, etc is referred to as specific LBP.[8] Some studies show the increased potential and low benefit of pharmacological care for acute and chronic low back pain Surgery has a limited role in chronic non-specific low back pain.[9] In the treatment of non-specific LBP, home exercise advice may be especially beneficial. In the subacute low back pain graded activity program improves the absenteeism outcome.[10] The primary goals of low back pain treatment are to decrease pain and improve functional ability, which can be achieved through exercises. In few patients, the pain causes significant limitations in physical ability and makes exercise difficult and be able to carry out their activities if their pain is under control. This provides support for the use of electrotherapy.[11] McKenzie therapy is most effective in pain reduction and improving the ability.[12] The McKenzie method is found to be more effective in pain reduction. The McKenzie method's core component of treatment is exercise, which consists of prolonged position or frequent motions.13 The most commonly used modalities for pain management are IFT and TENS. TENS is a type of stimulation with low frequency and IFT is a medium-frequency alternating current.[15] Many studies have been carried out to find the effect of TENS and IFT in the treatment of chronic LBP. Hence this research work is hypothesized to compare the effect of IFT with McKenzie and TENS with McKenzie in terms of pain reduction that is caused due to LBP.

Aim

To compare the effectiveness of IFT and TENS combined with McKenzie to reduce low back pain.

Material and Method

IFT apparatus, TENS apparatus, electrode pads, electrode gel ,micropore, cotton. The study was conducted on 60 subjects with a non-specific low back pain age group between 20 and 40 years for 2 weeks from Shanthi Physiotherapy clinic. Convenient sampling was used in this study. Study period: October 2022 to July 2023.

Inclusion criteria:

- Suffering from nonspecific low back pain
- Prolonged sitting (>3 hours)
- Both male and female
- Age group between 20 and 40
- pain due to prolonged standing
- pain that worsens during movement
- VAS score between 5 to 10
- ODI more than more than 40%
- Subjects who are willing to participate in the study

Exclusion criteria:

- Radiating pain
- Pregnancy
- sensory disorders
- Open wounds at the site of application of electrode
- Internal screw fixation in lumbar spine
- Tumor
- Congenital disorder of spine.

Outcome measures:

Assessment was done before and after the end of 2 weeks of study.

- VAS
- OSWESTRY Low back pain disability questionnaire.

Procedure

A total of 60 subjects were selected based on the selection criteria. The detailed procedure was explained and informed consent was obtained from the subjects. All the subjects were assessed using the VAS and asked to fill the OLBP disability questionnaire before and after the end of the treatment. 60 subjects were divided into two groups each group with 30 participants. IFT group (n=30). Subjects in IFT group were given Interferential therapy combined with McKenzie .TENS group (n=30) .Subjects in TENS group were given TENS along with McKenzie. The

subjects received Interferential therapy for 20 minutes per day along with McKenzie exercises(extension exercises -lying flat in prone position, prone on elbows, prone press up, standing lumbar extension) for 10 reps × 2 sets / day, 4 days in a week for 2 weeks. The subjects in the TENS group received TENS for 20 minutes per day along with McKenzie exercises, 4 days in a week for 2 weeks.

IFT Group: The subjects in the IFT group were given IFT combined with McKenzie low back exercises. The complete procedure was explained to the subjects before starting the treatment. Safety measures were assured to the subjects. Subjects were positioned prone lying on the couch. The IFT apparatus is turned off and the electrodes are cleansed before the treatment. Electrode gel is applied to the electrodes. The apparatus is turned on and is applied to the subjects using the micropore. Four electrodes are applied at the lower back in a clover leaf pattern which is perpendicular to each other. The duration is adjusted to 20 minutes. Intensity is raised to the subject's tolerance level which passes through the electrodes with frequency of 4000 HZ, beat frequency 100 Hz, sweep 50 Hz. The cables are disconnected after the treatment.

TENS group: Position of the subject: prone lying on the couch. The subjects in the TENS group received TENS along with McKenzie. The electrode gel is applied to the electrodes and placed 1 inch apart at the lower back region surrounding the area of the pain of the subjects with the machine turned off. The treatment is started with low intensity, and it is raised till the subject feels a tingling sensation with a frequency of 100 Hz. The intensity is adjusted to the subject's tolerance level. The duration of treatment is adjusted for 20 minutes.

McKenzie exercises for both groups:

Assessment is done on the subjects by collecting details such as history of symptoms, aggravating factor, relieving factor then the subjects were asked to perform sustained movement to find effect on their symptoms. McKenzie extension exercises were performed by the subjects.

Prone lying: The subject was instructed to lie in a prone position with their head turned to one side, arms by their sides. Instructions : Lie flat on your stomach with your arms close to your body and your head turned to one side. Hip should not be flexed. Take a deep inhalation , then relax for 5 minutes. Repeat for 2 times in a day. Then progress to be prone on the elbow, for the subjects who were unable to progress prone on the elbow are asked to rest for a day and then do the progression.

Prone on elbow: Instructions: Lie on your stomach by placing elbow under the shoulder, resting on your forearm. Subject is asked to take a deep breath and rest for 5 minutes, then progress to prone press ups.

Prone press up: Subject is asked to lie in a prone position with hands palms under the shoulder. The upper half of the body should be raised by straightening the arms. Lower body should be relaxed. Instruction: Raise your upper body slowly in pain free range, elbow and shoulder should be placed in the same line. Then the subject is asked to return to the starting position. 10 repetitions 2 sets per day. Progression done by applying overpressure at the back. Pressure is applied by using body weight through the arms , symmetrical pressure is maintained while the subject performs extension.

Standing extension: The subject is asked to stand in a neutral position placing hands at the back. Gradually bend the back as far as possible, hold for a second or two and then ask to return to the normal position.

Data Analysis

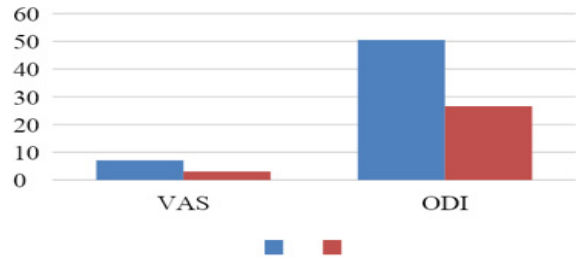

Fig - 1: Comparison between pretest and posttest values of IFT group- VAS and OLBP disability questionnaire

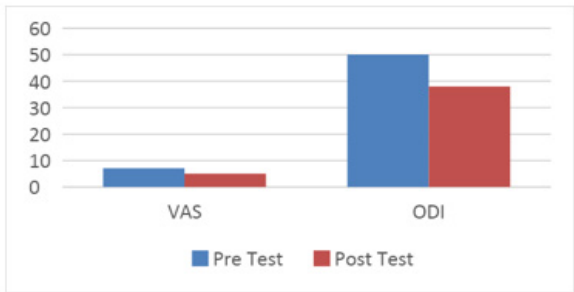

Fig - 2: Comparison between pretest and posttest values of TENS group - VAS and Oswestry Low back disability questionnaire

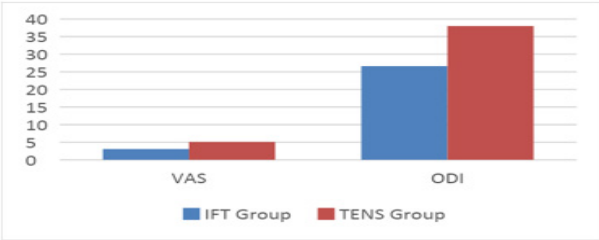

Fig - 3: Comparison between posttest values of IFT group and TENS group -VAS and Oswestry Low back disability questionnaire

Result

Fig 1: compares the pretest and posttest values of the IFT group using the VAS and OLBP disability questionnaire. The pretest and post test values of the IFT group using VAS score were mean value of 7.13 ± 3.07, SD value of 0.82 ± 0.78, and p value less than 0.0001. As a result, with p value <0.0001 the findings are judged statistically significant.

The pretest and posttest values of the IFT group using OLBP was mean value of 50.47 ± 26.63, SD value of 7.60 ± 9.18, and p value less than 0.0001. As a result, with a p-value < 0.0001, the findings are judged statistically significant.

Fig 2: compares the pretest and posttest values of the TENS group using VAS and OLBP disability questionnaire. The pretest and posttest values of TENS group using VAS and OSWESTRY LBP disability questionnaire were mean value of 7.10 ± 5.10, SD of 0.76 ± 0.76, and p value less than 0.0001 As a result, with a p-value of 0.0001, the findings are judged statistically significant.

The pretest and post test values of the TENS group using the OLBP disability questionnaire was mean value of 50.10 ± 38, SD of 7.34 ± 8.50 and p value less than 0.0001. From this result the findings are statistically significant.

Fig 3: compares the posttest values of IFT group and TENS group using VAS and OSWESTRY LBP disability questionnaire. As a result, with p value less than 0.0001, the findings are judged as significant.

The paired t-test and unpaired t-test were used to statistically analyze the values. A statistically significant difference was found between the IFT group and TENS group as well as within the group, according to the statistical analysis performed on the quantitative data. In the IFT group the post-test mean values for VAS and OLBP disability questionnaires are 3.07 and 26.63 while in the TENS group, the values are 5.10 and 38. This demonstrates that the IFT group's results a reduction in low back pain is noticeably superior.

Discussion

The goal of the current study is to compare the effects of Interferential therapy with Mckenzie versus TENS with Mckenzie exercise to reduce low back pain. The comparison is demonstrated with a duration of two weeks. The results were measured using the VAS and the Oswestry LBP disability questionnaire in pre and post treatment. Beneficial effects were significantly greater in the IFT group than the TENS group.

Based on the statistical analysis, both groups showed improvement in VAS and ODI. However, subjects in IFT subjects who received IFT with McKenzie exercise showed better improvement in VAS and ODI than the subjects in the TENS group who received TENS with McKenzie

An early study conducted a trial to find the effects of TENS and IFT to reduce nonspecific CLBP and found that both the treatment modalities were equally effective in the treatment of chronic nonspecific low back pain[11]. Another study on the effect of IFT along with extension exercises to reduce pain among patients with chronic low back pain and found that the treatment procedure was very much effective in reducing the pain, and improving spine extensor muscles strength in people with CLBP.[12] Whereas the specific trunk exercise in the recent study found it reduced the intensity of low back pain.[13] On the other hand, Mckenzie method is beneficial in treating acute low back pain condition and found that including McKenzie method-based treatment program to subjects with acute LBP receiving care had no effects on pain, disability or risk of developing persistent symptoms[15] An early study by Sayed Tantawi et al., for investigating the impact of IFT on pain, ROM and quality of life in patients with chronic non-specific low back pain and found that IFT stimulation penetrates deeper into the tissues, resulting in significant and

long-term pain reduction, as well as improvements in functional ability and it is considered as an effective method to decrease pain and improve the patients QOL [6].

Conclusion

The study concludes that the Interferential therapy along with McKenzie and Transcutaneous Electrical Nerve Stimulation along with McKenzie both are effective in reducing low back pain but IFT with McKenzie seems to be more effective when compared with TENS with McKenzie.

Ethical clearance: Taken from Institutional ethical committee. ISRB number-03/008/2022/ ISRB/SR/SCPT

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Conflict of Interest: Nil

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