



Comparison of the Effect of Neural Mobilization and Kinesio Taping on Pain and Quality of Life in Subjects with Sciatica – A Randomized Clinical Trial

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Abstract: Background and Purpose: There is paucity of comparison between the effect of neural mobilization and kinesio taping in reducing pain on sciatica although individual approaches have shown to reduce pain. We compared the effect of neural mobilization and kinesio taping on pain and quality of life in subjects with sciatica. Methods: 30 subjects with sciatica participated in this randomized clinical trial. Subjects were randomly allocated into neural mobilization or kinesio taping groups. Outcomes included Visual Analogue Scale (VAS), Sciatica Bothersomeness Index (SBI) and Modified Oswestry Low Back Pain Questionnaire (MODQ). Results: Although both neural mobilization and kinesio taping were effective in reducing pain and improving quality of life, neural mobilization showed statistically significant result than kinesio taping in Visual Analogue Scale and better results among other scales. Discussion and Conclusions: The results of this study show that although both neural mobilization and kinesio taping are helpful in reducing pain and improving quality of life in sciatica, neural mobilization is more effective compared to kinesio taping.

Keywords: Sciatica, Neural Mobilization, Kinesio Taping, Pain, Quality of Life

1. Introduction

Radicular pain in the distribution of the sciatic nerve, resulting from herniation of one or more lumbar intervertebral discs, is a frequent and often debilitating event. The lifetime incidence of this condition is estimated to be between 13% and 40%[1]. It is an often disabling and painful condition which is a major cause of disability, work loss and presentation to health-care[2]. It is usually caused by biomechanical strains[3], disc herniation[4] and morphological abnormalities of intervertebral disc[5]. There is huge physical and economic impact due to sciatica[6]. Various interventions that reduce the sciatica symptoms have been identified which includes both surgical and non-surgical methods[7]. Most common medical management is epidural steroid injection[8] whereas surgical management is done by lumbar spine operation[9]. Several randomized controlled trials comparing surgical and non-surgical interventions to reduce the sciatica symptoms have been conducted. But improvement in the patient's predominant symptom and

work and disability outcomes were similar regardless of treatment received[10,11]. Kinesio taping and neural mobilizations are two commonly used modes of treatment for sciatica[12]. Though both these treatments are seen to be effective in reducing the symptoms of sciatica, comparative study between these two techniques is lacking.

With regard to the paucity of trials comparing the effect of neural mobilization and kinesio taping, the purpose of this study was to compare their effects in reducing pain and seeing the effect in quality of life in peoples with sciatica. We hypothesized that either both treatment will be equally effective or one will be superior to other.

2. Methods

2.1. Design Overview

A randomized clinical trial of 2 week neural mobilization and kinesio taping was conducted over 3 months period from November 2015 to January 2016. Participants were recruited

from Tertiary Health Care Hospital. Subjects participated in an assessment session, followed by random allocation to either of the groups by envelope method. Both neural mobilization and kinesio taping group were given treatment for 3 times a week for 2 weeks. Sensory TENS was given to both groups of patients. All subjects were reassessed after 2 weeks.

2.2. Participants

Thirty five subjects with sciatica (SLR +ve for $\leq 70^\circ$) who were referred by Neuro medicine department for treatment of Sciatica were recruited. All patients were in on-medication state for reducing pain during enrollment, 20-60 years of age, both males and females with pain radiating up to the sole of foot and Visual Analogue Scale score greater than 5. Subjects were excluded if they had history of recent trauma to lower limb, associated neurological symptoms like foot drop, Spondylolisthesis, Cancer, SI joint dysfunction and cognitive impairment.

2.3. Ethical Review

All participants signed informed consent approved by KLEUIPT's Institutional Review Board. All work was done in accordance with declaration of Helsinki (1964). This clinical trial was conducted in between November 2015 and January 2016.

2.4. Randomization

Subjects were randomly allocated to either of the groups by envelope method. The person responsible for pre/post testing remained blinded to group assignment.

2.5. Intervention

During the treatment session, subjects were either given neural mobilization or Kinesio taping by the same therapist. The treatment was given thrice a week with one day interval with rest on Sunday's. To ensure an adequate level of treatment all sessions for all participants were given in hospital setting only with proper instructions given to both patient and attender of Kinesio taping group not to apply any lubricant and Soap in the area of Tape. Cotton Kinesiology tape named 'Nano Tape' was used for taping group with tape applied from sole on the lateral area till L3 spine throughout the course of Sciatic Nerve. For Neural Mobilization group Grade 4 Maitland mobilization for all branches of sciatic nerve i.e. Tibial, Common Peroneal, Sural, and Saphenous Nerve by taking the foot into Dorsiflexion, Plantarflexion and Inversion, Dorsiflexion and inversion and Dorsiflexion and Eversion respectively was given. Sensory TENS (SI no. TG 1446, Manufacturer: Technomed electronics) of frequency 4 Hz and pulse duration 0.1s was given to both group of subjects for 15 minutes after the initial treatment.

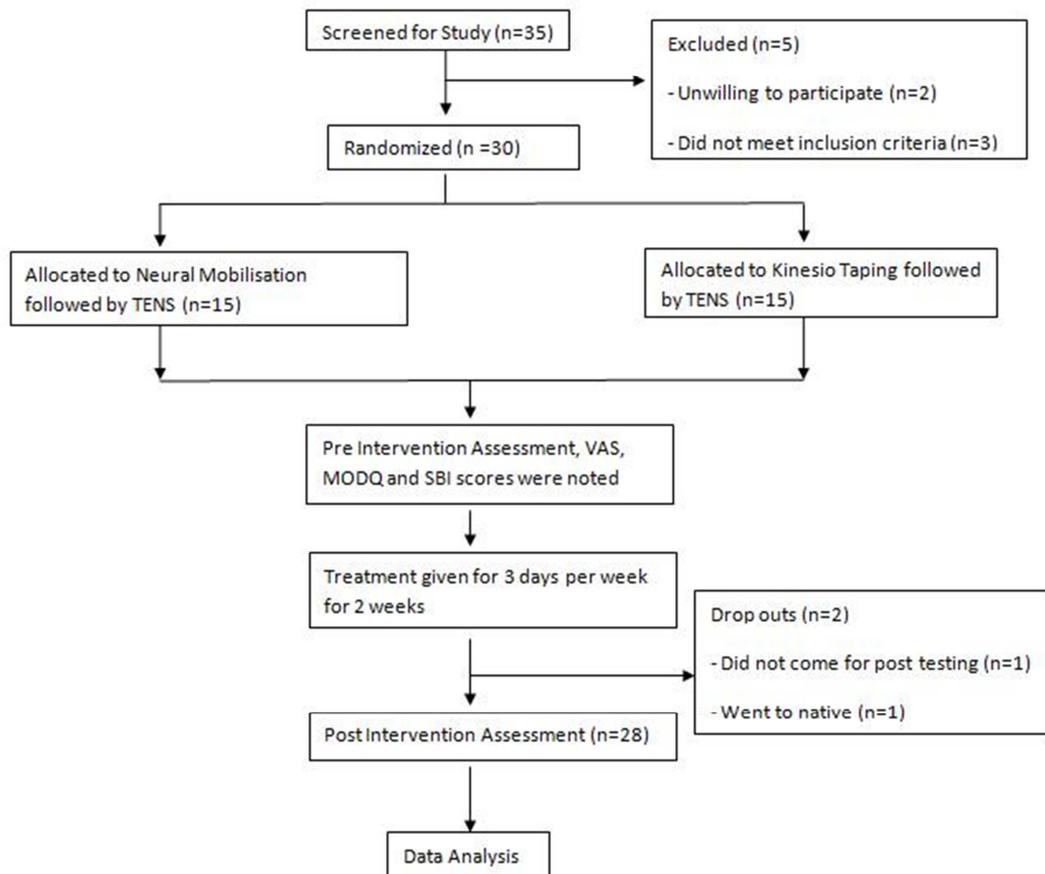


Figure 1. Consort Diagram.

Table 1. Characteristics of Participants.

| Parameter | Neural Mobilization | Kinesio Taping |
|-------------|---------------------|----------------|
| Age (y) | 32 ± 12.47 | 43.34 ± 13.12 |
| Weight (kg) | 59.93 ± 13.08 | 52.71 ± 8.34 |
| Height (m) | 1.59 ± 0.07 | 1.59 ± 0.08 |
| BMI | 23.54 ± 3.94 | 20.70 ± 2.66 |

2.6. Outcomes

2.6.1. Pain

Subjects from both groups were assessed for pain using Visual Analogue Scale (VAS). The recordings were taken before starting the treatment and after the treatment session of 2 weeks. Patients were asked to mark their pain on a straight horizontal line with 0 marked at the beginning of line and 10 marked at the end point. Subjects were explained that the marking were in increasing order of the pain. It is a valid, reliable and responsive scale.[13]

2.6.2. Botheromeness of Sciatica

Botheromeness of Sciatica was measured by Botheromeness of Sciatica Scale (SBI). It is a 6 point scale consisting the four components of sciatica i.e. Leg pain, Numbness or Tingling in leg, foot or groin, Weakness in leg and Foot and Back or Leg Pain while sitting. Subjects were asked to tick in one of the point for each component. SBI has extremely good reliability and Validity[14].

2.6.3. Quality of Life

It was measured by using Modified Oswestry Low Back Pain Questionnaire (MODQ). It is a scale consisting 10 sections. Each section has 6 points in increasing order of severity. Subjects ticked in one point for each section. MODQ has good reliability and validity[15]

2.7. Statistical Analysis

Normality of pre and posttest scores of various variables was measured by Kolmogorov-Smirnov Z test. All p values obtained were more than 0.05. As the pre and posttest scores of various variables did not follow a normal distribution, non-parametric tests were applied. Comparison of neural mobilization and taping groups with respect to VAS, SBI and MODQ scores at pre and posttest were done by Mann-Whitney U test. Analysis of the data was carried out using SPSS software, Version 20.

3. Results

Thirty patients with Sciatica were enrolled and 28 completed their study. 1 patient withdrew as he went to his native place and other one did not come for post testing. Seventy one percent of participants were female with the mean age 41.

Comparison between neural mobilization and taping groups with respect to VAS, SBI and MODQ were done by Mann-Whitney U test. There were statistical difference seen in all three scales but significant difference ($p < 0.05$) was seen only in VAS. The mean VAS score reduced from 7.50 to 4.60 in neural mobilization group and 7.36 to 5.59 in Kinesio taping group whereas the mean SBI score reduced from 7.50 to 4.60 in neural mobilization group and 12.50 to 9.14 in taping group. Also the MODQ scores showed the similar trend of results. Here the score reduced from 39.86 to 24.71 in neural mobilization group and 40.14 to 29.50 in taping group.

Table 2. Comparison of Neural Mobilization and Kinesio Taping with respect to VAS, SBI & MODQ scores.

| Neural Mobilization | Neural Mobilization | | | Kinesio Taping | | | P Value of difference |
|---------------------|---------------------|---------------|--------|----------------|---------------|--------|-----------------------|
| | Pre- Test | Post Test | P | Pre Test | Post Test | P | |
| VAS Scores | 7.50 ± 1.26 | 4.60 ± 1.20 | 0.5053 | 7.36 ± 1.42 | 5.59 ± 1.47 | 0.1078 | 0.0244 |
| SBI Scores | 12.21 ± 4.66 | 7.79 ± 3.12 | 0.9817 | 12.50 ± 4.45 | 9.14 ± 3.92 | 0.4082 | 0.1611 |
| MODQ Scores | 39.86 ± 15.54 | 24.71 ± 11.68 | 0.8542 | 40.14 ± 12.90 | 29.50 ± 11.26 | 0.1983 | 0.1078 |

There was only one adverse effect noticed during the treatment period. Pain was noticed in neural mobilization group immediately after the treatment which subsided maximally within a day.

4. Discussion

This study compared the effect of neural mobilization and kinesio taping on pain and quality of life in 28 subjects with Sciatica. The results of this study show that neural mobilization was more effective compared to Kinesio taping in reducing pain and improving quality of life in subjects with sciatica suggesting that the preference should be given to neural mobilization over kinesio taping. Neural mobilization belongs to manual therapy methods which deal with the nervous tissue and the tissues surrounding the

nervous system which substantially restore the plasticity of the nervous system i.e. the ability to move structures that surround the nerve tissue, and restore the ability of nerve tissue to tension and stretch. Normalizing the neuromechanics is considered as the main goal of neural mobilization therapy. Kinesio taping uses the sensory impact of the patch on the body in order to run compensation abilities. Previous studies have shown that neural mobilization and kinesio taping are effective in reducing the sciatica symptoms [16]. The effect of kinesio taping therapy on sciatic patients in pregnancy showed the decrease in sciatic symptoms [17]. Kinesio tape also helped in decreasing recalcitrant chronic low back and leg pain [18]. Kinesio tape proved to be effective in holistic physiotherapy for low back pain [19]. Also the efficacy of neural mobilization in sciatica was studied and it was seen to be effective in increasing

range of motion at hip and decreasing pain thus reducing the symptoms of sciatica[20]. A single-case design provided a measure of scientific support for the use of neural mobilizations among patients presenting with lower extremity neurogenic pain disorders[21]. But the study comparing these two techniques was lacking

The results of this study show that neural mobilization technique was more effective than kinesio taping in reducing the symptoms and improving the quality of life in persons with sciatica.

The mean age, height and BMI were similar in both the groups with slight difference in height. The female participants were more compared to the male participants but the ratio was equal in both the groups. The difference of within groups was significant when comparing both the groups. Interestingly, the BMI was significant in between the groups.

Comparison of neural mobilization and taping groups with respect to VAS score showed the significant reduction of pain in neural mobilization group. This could be due to instantaneous pain relief noted among the subjects of Neural mobilization group and also as few subjects applied soap or lubricant in the area of tape despite cautioning them not to. Although no significant group difference was noted in SBI scores there was significant reduction of scores in neural mobilization group than in taping group. The within group difference was significant for both the groups. This can be due to the fact that though neural mobilization was able to reduce leg pain, numbness or tingling and back or leg pain while sitting components it had very less effect on weakness in the leg component. Also there was significant improvement in quality of life of subjects in terms of lower MODQ. The questionnaire has 10 sections and few sections in the questionnaire could not show any improvement compared to others. This could be due to small duration of intervention and a follow up of the subjects need to be done to check the carry over effect of the intervention on quality of life. It was observed that sections of pain intensity, personal care, sitting, standing and sleeping showed improvement compared to the other sections of questionnaire. A statistical analysis between the sections was not done which can be considered as a limitation of the study.

There were few other limitations in this study including small sample size. Despite a small sample, significant improvements were seen in both the groups. The account of dosage of medications for pain relief was not taken. Although full details about the scales were given yet the result relied on patients report.

5. Conclusions

These results showed that neural mobilization technique was more effective than kinesio taping in reducing the symptoms and improving the Quality of Life in persons with sciatica

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