

RESEARCH ARTICLE

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A Study to Compare the Short-term Effects of Alternate Thrust Manual Therapy with Mobilization Therapy on Pain in Low Back Pain Subject's Satisfying CPR

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Abstract

Background: Low back pain (LBP) is one of the leading causes of pain and disability in both developed and developing countries, which is ranked on sixth position in overall disease burden. **Objectives:** To compare the short-term effects of alternate thrust manipulation therapy with non-thrust mobilization therapy on pain in a subgroup of low back pain subjects satisfying CPR. **Materials and Methods:** A comparative experimental study was conducted among the 30 study patients of age between 18-60 years diagnosed with low back pain. The patients were divided in two groups (15 each), First group (A) received the alternate thrust manipulation treatment for total two sessions in a week, whereas, second group (B) received non-thrust mobilization therapy for sixty seconds twice weekly. The study outcome measures like pain were measures by using the standard tools and the effect was analyzed by using the student t-test. **Results:** The patients in the first group showed the better pain management compared to the second group. The difference between the decrease of pain among the patients of both groups by VAS was statically significant ($p < 0.0001$), and also showed an increase (positive improvement) in quality of life by MODQ ($p < 0.001$). **Conclusion:** The study concluded the better pain control and better affect in quality of life of the patient with the back pain satisfying CPR.

Keywords: Modified Oswestry Disability Questionnaire, Low back pain, Alternate thrust manual therapy, Visual Analogue Scale.

INTRODUCTION:

Low back pain is a common health problem and the cause of disability and work loss, creating a large socioeconomic burden amongst the general population. It can be classified as an acute, sub-acute and chronic pain [1]. Pain can significantly affect an individual performance in their daily activities, thus there is need of better pain management [2]. There is wide application of physiotherapist to deliver the quality health care in the healthcare system. Traditionally, the health care was limited to the physician and pharmacists, but advancement in the healthcare sectors have bought extensive roles of all allied health workers with the clinical care by pharmacists [3, 4]. Various physical therapy measures can effectively control or prevent the pain and enhance the patient's quality of life in addition to various pharmacological measures [5]. The clinical prediction rule, commonly known as CPR helps in the suitable classification of the patients and to determine the suitable modalities need to be provided to the patients based on the clinical evidences. CPR is extensively used extensively among the patients diagnosed with acute or chronic low back pain [6]. There needs to be the effective pain management among the patients and the low back pain, but there is no definite physical

therapy to completely cure this pain [7]. Recently several modalities have gained the scientific attention for their pain reducing capacities [8]. Alternate thrust manipulation therapy had also gained the significant attention [9]. However, there is still paucity of the comparative data on the better pain management and improvement of quality of life using alternate thrust manipulation therapy (AMT) and Non-thrust mobilization therapy on low back pain subjects who satisfying CPR.

METHODS

An experimental, comparative study was conducted for period of 10 months among the patients diagnosed with low back pain referred to physiotherapy department of Dr. MV Shetty Hospital & other physiotherapy centres attached to Dr. MV Shetty College of physiotherapy, Mangalore. A total of 30 patients diagnosed with low back pain satisfying the CPR aged between 18-60 and willing to participate in the research study after their volunteer informed consent were included in the study, whereas the patient with comorbidities like nerve root compression, muscle weakness and pregnant women or the

patient who have had gone through the recent surgery or medical procedures were excluded from the study. The patients were randomly assigned to group A and Group B by chit methods. A suitable data collection form was prepared, and all the relevant data were collected from the patients before and after providing the pain management modalities. The subjective data on pain was collected using the VAS and data pertaining the quality of life was collected using the MODQ scale. Group A had 15 subjects the subjects were given alternate thrust manipulation therapy for 2 sessions in a week as detailed below. All patients had attended 2 therapy sessions in a week i.e., alternate manual therapy technique for session 1 and 2. The second group received the non-thrust mobilization. The patients were followed up after the pain modalities and the post intervention data was collected using the same data collection tools. The relevant data on the level of pain and the quality of life were analyzed using the students t-test (un-paired).

RESULT

In the present study 30 subjects were examined i.e. 15 subjects in each group. Group A were examined for the effectiveness of one week of alternate thrust manipulation therapy and group-b were examined for the effectiveness of one week of non-thrust mobilization therapy on pain and quality of life with the subjects of low back pain.

Distribution of patient based on their age and gender:

The age range was between 18-60 years for group A and 19-58 years for group B. The mean age for group A was 33.27 ± 11.991 . Similarly, the group B mean age was 33.27 ± 11.883 . The 't'-test value was .000 and p value was 1.000, which showed no significant difference between the groups. Both groups were well matched with respect to age. Similarly, the group A had 6 female and 9 male subjects, while the group B had 6 female and 9 male subjects. The percentage of female subjects in group A was 40.0% and male percentage was 60.0%. In group B the female subject's percentage was 40.0% while male subject's percentage was 60.0%. The p value was 1.00, which was not statistically significant. This implied that the male and female population between group A and B were matching well.

Analysis of study outcome measures i.e. pain by VAS and quality of life by MODQ among both groups

Comparison of pain by VAS between Group A and B before interventions:

The mean value of VAS for group A was 7.40 ± 0.632 , similarly the mean value of VAS for group B was 7.40 ± 0.632 . Using paired t test t value was 0.000 and p value was 1.000, which was not statistically significant. This implied that the group A and B participants had similar intensity of pain before intervention.

Comparison of quality of life by MODQ (%) between Group A and B before interventions:

The mean value of MODQ before intervention for group A was 58.80 ± 2.484 and while group B had a mean value of 58.80 ± 2.484 respectively. The t-value was .000 and p value was 1.000 which was not statistically significant. This implied that the quality of life by MODQ between group A and B were at similar level before intervention.

Analysis of Pain by VAS and quality of life by MODQ (%) within Group-A after intervention

The mean value of VAS for group A before intervention was 7.40 ± 0.632 , while the mean VAS was $1.53 \pm .516$ post intervention. Comparison of above had a t value of 44.000 value and a p value of 0 .000 which was statistically highly significant. This indicated that the group A subjects had a highly significant decrease in pain by VAS following One week of Alternate Thrust Manipulation Therapy Intervention in subjects with Low back pain satisfying CPR. Similarly, the mean value of MODQ for group A before intervention was 58.80 ± 2.484 , while the post intervention value was 23.87 ± 2.560 . The comparison of above had a t value of 51.957 and p value was .000 which was statistically highly significant. This indicated that the group A subjects had a highly significant improvement in quality of life (positive improvement) by MODQ following One week of Alternate thrust manipulation Therapy intervention in subjects with Low back pain satisfying CPR.

Analysis of pain by VAS and quality of life by MODQ (%) within Group B after intervention

The mean value of pain by VAS for group B before intervention was 7.40 ± 0.632 , while the post intervention, VAS mean value was 4.0 ± 0.756 . The comparison of above had the t value of 25.968 and p value was 0.000 which was statistically highly significant. This indicated that the group B had significant decrease in pain following One week of non-thrust mobilization therapy intervention. The mean value of MODQ for group B before intervention was 58.80 ± 2.484 , while the post intervention MODQ mean value was 34.40 ± 3.135 . The comparison of above had 't' value of 33.175 and p value was .000 which was statistically highly significant. This indicated that the group B had significant positive improvement in quality of life following One week of non-thrust mobilization therapy intervention.

Analysis of pain by VAS and quality of life by MODQ between Group A and B after intervention

Before intervention: In group A, the mean VAS was 1.53 ± 0.516 while the same for group B was 4.00 ± 0.756 after intervention. The comparison of above had t-value of -10.435 and p value of 0.000 ($p < 0.05$) which was statistically highly significant. This indicated that the group A subjects which had received One week of Alternate thrust manipulation had significant decrease in pain by VAS in comparison to group B which had received one-week on-thrust mobilization Therapy in low back pain subjects satisfying CPR.

After intervention: In group A mean MODQ (%) was 23.87 ± 2.560 while the same for group B was 34.40 ± 3.135 after intervention. The comparison of above had the t-value of -10.080 and p value of .000, which was statistically highly significant. This indicated that the group A subjects which had received One Week Alternate Thrust manipulation therapy had shown significant improvement in quality of life in comparison to group B which had received one week of non-thrust mobilization therapy in subjects satisfying CPR.

DISCUSSION

The aim of the study was to compare the short-term effects of alternate thrust Manual therapy with non-thrust mobilization therapy on pain in a subgroup of low back pain subject's satisfying CPR.

In this study, the subject's age range was between 18-60 years for group A and 19-58 years for group B. The statistical analysis of age had a p value of 1.000 which was not significant and this implied that the subject in the group A and B were well matched with respect of age. The study was similar to the study conducted by Cleland JA et al., 2006, which was positively correlating to this study [8]. The subjects in Group A showed a highly significant decrease on pain by VAS, and increase (positive improvement) in quality of life by MODQ after two sessions of Alternate thrust manipulation Therapy intervention in a week with an interval of three days in between. The subjects in Group B also showed a highly significant decrease on pain by VAS, and increase (positive improvement) in quality of life by MODQ after two sessions of non-thrust mobilisation therapy in a week with an interval of three days in between. Comparison of effects of intervention between Group A and B found that the Group-A i.e., subjects received Alternate thrust manipulation Therapy, had a highly significant, decrease on pain by VAS, and increase (positive improvement) in quality of life by MODQ over the Group B i.e. subjects received non thrust mobilization therapy, after two sessions in one week of interventions respectively in a subgroup of LBP subject's satisfying CPR.

The baseline data (before intervention) of VAS of Group A and B were analyzed, the p-value showed no significant difference in VAS of subjects between two groups ($p > 0.05$). The baseline data of MODQ of Group A and B were compared, which was not significant. Before the intervention, both the groups were in the same level of pain by VAS, and similar level of quality of life by MODQ.

The subjects in Group A showed a highly significant decrease on pain by VAS, and increase (positive improvement) in quality of life by MODQ after one week of Alternate thrust manipulation Therapy intervention. This indicated that the group A subjects had a highly significant decrease in pain following one week of alternate thrust manipulation Therapy intervention. The analysis of quality of life by MODQ within the group A had a highly significant increase in quality of life following one week of alternate thrust manipulation therapy intervention.

The subjects in Group B showed a highly significant decrease on pain by VAS, and increase (positive improvement) in quality of life by MODQ after One week of non-thrust mobilization. The analysis of pain by VAS within the group B had significant decrease in pain by VAS after non-thrust mobilization. The analysis of quality of life by MODQ in group B had shown highly significant improvement in quality of life after non thrust mobilization intervention. Joint mobilization technique is assumed to induce various beneficial effects. The neurophysiologic effect is based on stimulation peripheral mechanoreceptors and inhibition of nociceptors. The biomechanical effect manifests itself when facets are directed towards the resistance but within the limits of

subject's tolerance. The mechanical changes may include breaking up of adhesions, realigning collagen, or increasing fibre glide when specific movements stress the specific parts of the capsular tissue. Furthermore, mobilization technique is supposed to increase or maintain joint mobility by changes in the synovial fluid, enhanced exchange between synovial fluid and cartilage matrix, and increase in synovial fluid turnover. The highly significant decrease of pain and increase in Quality of life in group B subjects could be due to various above effects of mobilization therapy as well as due to selective subject's inclusion in this study.

CONCLUSION

Comparison of effects of one week of interventions between Group A and B found that the Group A i.e., subjects received alternate thrust manipulation intervention, had a highly significant decrease on pain by VAS, and increase (positive improvement) in quality of life by MODQ over the Group B i.e., subjects received non-thrust mobilization therapy. Hence, this study concluded and recommended the use of alternate thrust manipulation therapy in a subgroup of low back pain subject's satisfying CPR.

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LIST OF ABBREVIATIONS:

MODQ: Modified Oswestry Disability Questionnaire; **VAS:** Visual Analogue Scale; **LBP:** Low Back Pain; **CPR:** Clinical Prediction Rule; **AMT:** Alternate Manual Therapy.

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