



International Journal of Medical and Exercise Science

(Multidisciplinary, Peer Reviewed and Indexed Journal)

ORIGINAL ARTICLE

A COMPARATIVE STUDY OF MANUAL TRACTION AND MECHANICAL TRACTION ON ACUTE DISCOGENIC PAIN

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ABSTRACT

Background and purpose: Acute low back pain is defined as Low back pain that has been present for less than three months and it was estimated that 80% of the population suffers from low back pain (LBP) at some point of their lives. Low back pain is the primary factors which limit activity in patients less than 45 years old and it is of significant socio-economic relevance because it may lead to temporary loss of productivity, enormous medical and indirect costs or even leads to permanent disability. The purpose of study was to compare a manual traction versus mechanical traction for reduce acute discogenic pain. **Method:** The study was conducted at JKK Munirajah Medical Research Foundation college of physiotherapy Out Patient department 30 subjects were selected in random sampling method. They were divided into 2 Group, namely Group A and Group B with 15 subjects in each Group. The enrolled 30 subjects were randomly allotted to two Group A (15) & B (15). After recruitment on eligibility, informed consent is obtained on explaining the treatment to be given. **Result:** The result showed that there was statistical significant difference between Group A and B. The acute discogenic pain patient who was treated with manual traction had shown good improvement in reduction of acute discogenic pain. **Conclusion:** The study concluded that there was a statistically significant improvement in reduction of pain improving flexibility and functional ability after the treatment of manual traction for 4 weeks. Thus the study concluded that manual traction (MAT) was the effective treatment than mechanical traction (MET) of acute discogenic low back pain.

Keywords: Manual traction (MAT), mechanical traction(MET), visual analogue scale, Oswestry disability index

Received on 16th July 2024; Revised on 12th August 2024; Accepted on 25th August 2024
DOI:10.36678/IJMAES.2024.V10I03.002

INTRODUCTION

Acute low back pain is defined as Low back pain that has been present for less than three months and it was estimated that 80% of the population suffers from low back pain (LBP) at some point of their lives. Low back pain is the primary factors which limit activity in patients less than 45 years old and it is of significant socio-economic relevance because it may lead to temporary loss of productivity, enormous medical and indirect costs or even leads to permanent disability¹.

Discogenic low back pain and disc herniation accounts to about 39% and 30% of LBP incidences respectively. Disc disorders were first documented by Crock in 1970, and the term Discogenic LBP was coined in 1979. Since then, many scholars have conducted in-depth studies on this condition. Discogenic pain is associated with activities that increase the pressure within the intervertebral disc (called intradiscal pressure) like Sitting, bending forward, coughing, sneezing and the peripheral leg pain could be caused by the disc itself and the major part occurs due to nerve irritation caused by disc herniation².

The management of discogenic low back pain remains extensively debated, the traditional approach has been non-surgical treatment aiming to achieve analgesia and improve regional function supplemented by physiotherapy in the form of modalities and exercises. The knowledge of these modalities are limited, there are also a number of alternative interventions such as massage, spinal manipulation, exercises, and traction. Physiotherapy interventions for the management of LBP are wide and variable. But the efficacy of many treatments is still questionable³.

Lumbar traction has been used for the treatment of low back pain since the time of Hippocrates. It provides gradual and controlled stretch needed to overcome muscle resistance,

thereby allowing effective distraction of the intervertebral discs and/or the intervertebral joint spaces. Axial spinal Distraction therapy is based on the theory that reducing intradiscal pressure will relieve back pain by repositioning the disc, improving microcirculation and releasing compression⁴.

Various authors have suggested various positions to apply traction, but in supine position with hip and knee 90/90 degree flattens lumbar curvature and the distraction force is distributed throughout the lumbar region and was proven to be very effective⁵.

Currently mechanical and manual traction are used widely than other traction methods and both are indicated for acute and chronic low back pain. But still there is controversy exists in applying mechanical and manual traction for acute and chronic low back pain individuals and very few studies have been done homogenously on these patients considering above traction methods⁶.

This study attempts to find out the effects of manual and mechanical traction in individuals with acute discogenic low back pain and to consider manual traction as a predictor to decide on the indication and prognosis following mechanical traction when applied as treatment for discogenic lesions.

METHODOLOGY

This is a comparative study conducted at JKK Munirajah Medical Research Foundation College of physiotherapy Out Patient department, Komarapalayam, Tamil Nadu.

30 subjects were selected in random sampling method. They were divided into 2 Group, namely Group A and Group B with 15 subjects in each Group.

The enrolled 30 subjects were randomly allotted to two groups A (15) & B (15). After recruitment on eligibility, informed consent is obtained on explaining the treatment to be

given. They then administer the self-report measures and outcome measures.

Group A

Individuals in Group A receives manual traction and the parameter as follows, Unilateral leg pull traction. With the patient secured to the table with a thoracic counter traction harness, the therapist brings the patient's hip into 30-degree flexion, 30-degree abduction, and maximum external rotation. A steady pull is then maintained for 10 – 15 sec for 3 to 10 min.

Group B

Individuals in Group B receives mechanical traction and the parameter as follows,

Mechanized spinal traction is given for 10 - 20 min on split table in Fowler's (supine) position, using 30 – 60 % of body weight. With 60 sec hold and 10 -20 sec rest.

The individuals in both Group underwent treatment for one week and VAS, ODI questionnaire, values were obtained before treatment in first visit and after completion of therapy at the end of seven sittings .The pre, post data were subjected to statistical analysis using SPSS software version 16.0.The post treatment data's of VAS, ODI, are compared and analyzed by 't' test.

Group A: Manual traction

The comparative mean value, mean difference, standard deviation, and paired 't' value between pre and post-test value of Oswestry disability Index in Group A.

ODI	Mean	Mean difference	Standard deviation	paired 't' value
Pretest	26.67	11.54	2.13	27.95
Posttest	15.13			

Table 4. Pre and Post-test value of Oswestry disability Index in Group A.

The paired "t" value of 27.95 was greater than the tabulated " t "value which showed that there was a statistically significant difference at 0.05 level between pre Vs post test results.. The pre test mean was 26.67 and the mean

post test was 15.13 and mean difference was 11.54 which showed that there was statistically significant improvement in response to the treatment with manual traction in Group A.

GROUP B: Mechanical traction

The comparative mean value, mean difference, standard deviation, and paired 't' value between pre and post-test value of Oswestry disability Index in Group B.

ODI	Mean	Mean difference	Standard deviation	Paired 't' value
Pretest	26.80	6.93	1.68	21.96
Posttest	19.87			

Table 5. Pre and Post-test value of Oswestry disability Index in Group B.

The paired "t" value of 21.96 was greater than the tabulated "t" value which showed that there was a statistically significant difference at 0.05 level between pre Vs post test results. The pre test mean was 26.80 and the mean post

test was 19.87 and mean difference was 6.93 which showed that there was statistically significant improvement in using the mechanical traction in Group-B patient with discogenic low back pain.

Group A and Group B

The comparative mean value, mean difference, standard deviation, and unpaired 't' value between post and Post-test value of ODI in Group A and Group B.

Oswestry disability index	Mean	Mean difference	Standard deviation	Unpaired 't' test
Group A	1.87	5.06	1.22	12.84
Group B	6.93			

Table 6. Comparative test on ODI between in Group A and Group B

The above table shows the post-test analysis result in ODI for Group A and B. The mean value of Group A was 1.87 and mean value of Group B was 6.93. And the unpaired 't' test value was 12.84 at 0.0001 level, which was greater than tabulated 't' value. It showed statistical significance difference between mean values of Group A and B.

DISCUSSION

In the analysis and interpretation of Visual analogue scale for Group A; The paired "t" value of 28.98 was greater than the tabulated 't' value showed that there was a statistically significant difference at 0.05 level between pre

test and post test results. The pre test mean was 16.67, the posttest mean was 2.67 and the mean difference was 14.00 which showed that there was statistically significant improvement in visual analogue scale for Discogenic lower back pain with treatment of Manual Traction in Group -A.

In the analysis and interpretation of Visual analogue scale for Group B; The paired "t" value of 8.91 was greater than the tabulated t- value which showed that there was a statistically significant difference at 0.05 level between pre and post test results. The pre test mean was 6.93 posts test mean 5.27 and mean difference

was 1.66, which showed that there was statistically significant in visual analogue scale for Discogenic lower back pain with treatment of Mechanical Traction in Group - B

In the analysis and interpretation of Visual analogue scale in Group A and Group B; The above table shows the post-test analysis result in VAS for Group A and B. The mean value of Group A was 4.07 and mean value of Group B was 11.53 and the unpaired 't' test value was 16.96 at 0.0001 level, which was greater than tabulated 't' value. It showed statistical significance difference between mean values of Group A and B.

In the analysis and interpretation of Oswestry disability index for Group A; The paired "t" value of 27.95 was greater than the tabulated "t" value of 2.13 which showed that there was a statistically significant difference at 0.05 level between pre Vs post test results. The pre test mean was 26.67 and the mean post test was 15.13 and mean difference was 11.54 which showed that there was statistically significant improvement in response to the treatment with manual traction in Group A.

In the analysis and interpretation of Oswestry disability index for Group B; The paired "t" value of 21.96 was greater than the tabulated "t" value which showed that there was a statistically significant difference at 0.05 level between pre Vs post test results. The pre test mean was 26.80 and the mean post test was 19.87 and mean difference was 6.93 which showed that there was statistically significant improvement in using the mechanical traction in Group-B patient with discogenic low back pain.

In the analysis and interpretation of Oswestry disability index in Group A and Group B; The

above table shows the post-test analysis result in ODI for Group A and B. The mean value of Group A was 1.87 and mean value of Group B was 6.93 and the unpaired 't' test value was 12.84 at 0.0001 level, which was greater than tabulated 't' value. It showed statistical significance difference between mean values of Group A and B.

Several mechanisms have been proposed to explain the effects of traction (e.g., elongation of soft tissues around the facet joints, correction of displaced intervertebral discs and facet joints, separation of facet joints, expansion of intervertebral foramina, reduction of intervertebral discs pressure, reduction of disc protrusions, elongation of anterior and posterior longitudinal ligaments, relaxation of muscle spasm, improvement of blood circulation, and psychological effects)^{12,13}.

CONCLUSION

The study concluded that there was a statistically significant improvement in reduction of pain and improving flexibility and functional ability after the treatment of manual traction for 4 weeks.

Thus the study concluded that manual traction was the effective treatment than mechanical traction of acute discogenic low back pain.

Acknowledgement: We are thankful to all candidates who were given more support engaged in this study.

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L. Manikandan, Kannan Dhasaradharaman, Vishnupriya. R, Anantharaj. K, Abilashprasannan. P (2024). A Comparative Study of Manual traction And Mechanical Traction On Acute Discogenic Pain, *ijmaes*; 10(3); 1881-1886.