



EVALUATION OF HIP JOINT RANGE OF MOTION IN MECHANICAL CHRONIC LOW BACK PAIN- AN OBSERVATIONAL STUDY

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ABSTRACT

Low back pain is one of the major cause for frequent medical consultation among world .In most of the cases reasons were unknown. Now a days people are using hip movements at reduced rate in day to day life which became one of the serious factors for causing low back pain . The main aim of the study was to check the hip range of motion for mechanical chronic low back pain patients. Study design was non experimental and study type was observational and sub type was cross sectional. 120 Subjects were selected applying both inclusion and exclusion criteria .Using goniometry hip joint range of motion was calculated . The result of the study confirms that hip joint range of motion was greatly reduced for mechanical chronic low back pain patients. The study concluded that there was significant reduction in hip joint range of motion for mechanical chronic low back pain patients. So Physiotherapy intervention for chronic low back pain patients should include hip joint range of motion exercises.

KEYWORDS: Goniometry, Range of motion, Low back pain, Mechanical.



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INTRODUCTION

Low back pain is the most important cause of activity restriction and work absence in every part of world which leads to a major social problem¹⁻². Non specific low back pain has become one of the serious health problem reaching throughout the world. In the duration of person's life an estimated prevalence of non specific low back pain was 60% to 70% in developed countries. The prevalence rate for adult has become higher¹⁻³. Some of the mechanical factors like lifting and carrying heavy things, driving motor cycle for long time , back pack carrying and lifestyle changes leads to non specific low back pain¹². Low back pain was mostly due to poor postures and other mechanical factors¹². Low back pain which has been present for three months and more are taken as chronic. Chronic low back pain causes may be an injury, stress on structures of body or diseases. Major risk factors for adolescent age groups were smoking and poor leg flexibility⁵. Less use of hip joint movements leads to low back pain⁷⁻¹⁰. The association between low back pain and restriction in hip joint was explained in various studies¹¹. So hip joint movements plays very important in mechanical low back pain. There was no accepted management for mechanical chronic low back patients by Physiotherapists¹⁵⁻¹⁷. The need of the study was to know the importance of hip joint movements and its range of motions in mechanical chronic low back pain. Therefore the main aim of this study was to evaluate the hip joint range of motion for mechanical chronic low back pain patients when compared with normal range of motion.

METHODOLOGY

Study design was non experimental and study type was observational, cross sectional . Inclusion criteria for selecting subjects were low back pain more than 3 months , age from 16 - 40 years , both male and females , visual analogue scale score between 3-7 were included . Exclusion criteria for subjects were any neurological conditions, spine fractures, osteoporosis, arthritis ,neo plasm ,vascular diseases, cognitive

disorder, pregnant women, any recent surgeries for last three months, recent fracture.

PROCEDURE

Subjects with mechanical chronic low back pain were approached, the procedure was explained and consent would be taken to participate in the study. 150 samples with mechanical chronic low back pain was taken in and around Chennai .Goniometry was the instrument used for measuring range of motion for hip joint. Before starting the methods mild passive movements were given to both hip joints. Then movements of hip flexion, extension, abduction, adduction , internal rotation, external rotation were taken .The placements of goniometry for evaluating hip joint range of motion was given in Table 1.1.

DATA ANALYSIS

Statistics were done by using IBM SPSS (version 20). Mean and standard deviation was found for both hip joints range of motions of mechanical chronic low back pain. Paired 't' test was used to analyze the normal range of motion with mechanical chronic low back pain patients .

RESULTS

The results of this study were, the mean of hip flexion for right side = 104.1±10.10, left side = 102.64±10.30 . Left side hip flexion was affected most. Then for rotational movements of hip joints for right side - internal rotation = 31.65±8.59, external rotation = 31.3±9.16 ; left side - internal rotation = 32.89±6.68, external rotation = 33.28±7.57 .Right side rotation movement was affected more than left side. Abduction of hip joints for right side = 37.40±7.42 , left side = 36.79± 7.65 . Extension of hip joints for right side = 24.01±6.15 , left side = 23.39±23.39. Adduction of hip joints for right side = 25.38±4.88 , left side = 25.80± 5.28. Mean values of hip flexion and external rotation of both sides were greatly reduced than other hip joint movements in mechanical chronic low back pain patients. There was significant reduction in all hip joints range of motion when it compared with normal range of motion (p<0.00).

Table 1.1
Procedure for evaluating hip joint range of motion¹⁸

MOVEMENT	PATIENT POSITION	AXIS	STATIONARY ARM	MOVABLE ARM	NORMAL RANGE
FLEXION	Supine lying	Greater trochanter of femur on measuring side	Parallel to mid axillary line of the trunk	Parallel to the longitudinal axis of the femur, pointing towards the lateral epicondyle	120°
EXTENSION	Prone lying	Greater trochanter of femur on measuring side	Parallel to the mid axillary line of trunk	Parallel to the longitudinal axis of the femur , pointing toward the lateral epicondyle.	30°
ABDUCTION	Supine lying	Anterior superior iliac spine on measuring side	Along line between the two anterior superior iliac spine's.	Parallel to the longitudinal axis of the femur.	45°
ADDUCTION	Supine lying	Anterior superior iliac spine on measuring side	Along line between the two anterior superior iliac spine's	Parallel to the longitudinal axis of the femur.	30°
INTERNAL ROTATION	High sitting(hip and knee flexed 90degree)	Midpoint of patella on measuring side	Perpendicular to the floor.	Parallel to the anterior midline of the tibia.	45°
EXTERNAL ROTATION	High sitting(hip and knee flexed 90degree)	Midpoint of patella on measuring side	Perpendicular to the floor.	Parallel to the anterior midline of the tibia.	45°

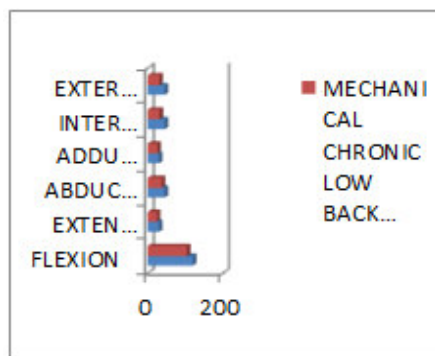
Table 1.2
Mean and standard deviations of hip range of motion.

HIP RANGE OF MOTION	NORMAL RANGE	RIGHT SIDE		LEFT SIDE	
		MEAN	SD	MEAN	SD
FLEXION	120	104.100	10.10233	102.6417	10.30688
INTERNAL ROATION	45	31.65	8.59319	32.8917	6.6885
EXTERNAL ROTATION	45	31.3	9.16478	33.2833	7.57393
ABDUCTION	45	37.4083	7.42299	36.7917	7.65857
EXTENSION	30	24.0167	6.15757	23.3917	23.39691
ADDUCTION	30	25.3833	4.88727	25.8083	5.28721

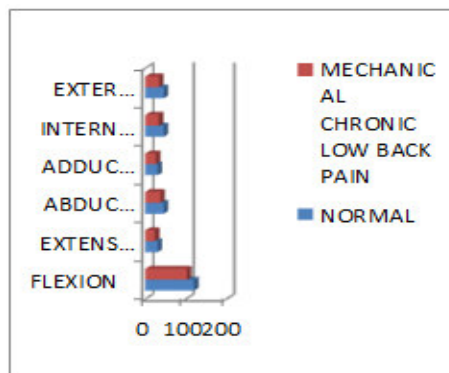
Table1.3
Comparison of hip range of motion between normal and mechanical chronic low back pain patients.

MOVEMENTS COMPARED	Mean	Std.Deviation	t	Df	Sig
NORMAL RIGHT FLEXION - PATIENTS RIGHT FLEXION	15.90000	10.10233	17.241	119	.000
NORMAL RIGHT EXTENSION - PATIENTS RIGHT EXTENSION	5.98333	6.15757	10.644	119	.000
NORMAL RIGHT ABDUCTION - PATIENTS RIGHT ABDUCTION	7.59167	7.42299	11.203	119	.000
NORMAL RIGHT ADDUCTION - PATIENTS RIGHT ADDUCTION	4.61667	4.88727	10.348	119	.000
NORMAL RIGHT INTERNAL ROTATION - PATIENTS RIGHT INTERNAL ROTATION	13.35000	8.59319	17.018	119	.000
NORMAL RIGHT EXTERNAL ROTATION -PATIENTS RIGHT EXTERNAL ROTATION	13.70000	9.16478	16.375	119	.000
NORMAL LEFT FLEXION - PATIENTS LEFT FLEXION	17.35833	10.30688	18.449	119	.000
NORMAL LEFT EXTENSION - PATIENTS LEFT EXTENSION	6.60833	5.44691	13.290	119	.000
NORMAL LEFT ABDUCTION -PATIENTS LEFT ABDUCTION	8.20833	7.65857	11.741	119	.000
NORMAL LEFT ADDUCTION -PATIENTS LEFT ADDUCTION	4.19167	5.28721	8.685	119	.000
NORMAL LEFT INTERNAL ROTATION -PATIENTS LEFTINTERNAL ROTATION	12.10833	6.68850	19.831	119	.000
NORMAL LEFT EXTERNAL ROTATION- PATIENTS LEFT EXTERNAL ROTATION	11.71667	7.57393	16.946	119	.000

Graph 1
Comparison of normal range of motions with mechanical chronic low back pain of hip joint in right side



GRAPH 2
Comparison of normal range of motions with mechanical chronic low back pain of hip joint in left side



DISCUSSION

The main intention of the study was to evaluate the hip joint range of motion in mechanical chronic low back pain patients with normal range of motion. The results of the study proved that all movements in hip joint on both sides for mechanical chronic low back pain were reduced when compared with normal hip joint range of motion. The reason behind this reduction of range of motion is due to biomechanical alterations of pelvicfemoral motion. The inter related movements of spine, pelvis and femur produce a great range of motion than an individual joints range of motion, this was termed as pelvicfemoral motion. Pelvicfemoral motion also mentioned as pelvicfemoral "rhythm", which understood a consecutive relationship between the two segments which would vary among individuals. Murray and colleagues found between 8% and 32% of the total range of motion in hip joint was provided by pelvic tilt²⁰. Continuous and repeated movements of lumbopelvic region focuses high stress on tissues, causing micro trauma and low back pain²¹. Initial lumbopelvic movement which aggravates the low back pain if the hip joint in lateral rotation²². During lateral rotation of hip joint, low back pain patients shows greater and quick lumbopelvic rotation while compared with normal individuals⁶. Hip joint movements limitation which extremely connected with low back pain patients^{9,14}. When hip joint movements were limited lumbopelvic region compensatory movements occurs which increases the load in back region and cause

stress which ultimately cause low back pain^{10,14}. So our physiotherapy intervention for mechanical chronic low back pain patients should concentrate in hip joint movements. Hip joint mobilisations, stretching and strengthening programs for hip muscles can also be included in physiotherapy treatment protocol for mechanical chronic low back pain patients²³.

CONCLUSION

The study shows that there was reduction in all hip joint movements on both sides in mechanical chronic low back pain patients. Therefore consideration of hip joint movements and its interventions should be concentrated more while treating mechanical chronic low back pain patients. We suggest the study can be done with large number of samples and also for acute low back pain patients. To measure hip joint range of motion use other forms of objective measurements like inclinometer can be used in future studies.

ACKNOWLEDGMENTS

The authors would like to acknowledge all people who helped us to complete this study.

CONFLICT OF INTEREST

Conflict of interest declared none.

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