Original Article

Effects of McKenzie Method of mechanical diagnosis and therapy on lumbar ROM & pain in patients with Non-specific low back pain

Shoaib Kayani, Muhammad Mudassar Yasin, Arva Naeem, Ahmad Bilal Arif, Syeda Rafia Mansoor, Ayesha Majeed

Department of Health Sciences, Khawaja Fareed University of Engineering Information Technology, Fatima Memorial Hospital, University of Management Technology, Foundation University Institute of Rehabilitation Sciences FUIRS, The Children's Hospital Institute of Childs Health, Lahore, Pakistan

Objective: To compare effectiveness of mechanical diagnosis and therapy approach designed by McKenzie along with core stabilization exercises in patients of Non-specific low back pain.

Methodology: A quasi-experimental trial was conducted from September 2018 to December 2019 on 50 non-specific low back pain patients. They were divided into two groups; Group A was treated with mechanical diagnosis and therapy technique along with conventional therapy while Group B was treated with core stabilization exercises along with conventional therapy. Each subject received 12 sessions, 4 times per week for 3 weeks. Pain was assessed via Numeric Pain Rating Scale & Lumbar Range of Motion via Bubble Inclinometer.

Results: Statistically significant differences were observed within group analysis as well as between groups. Numeric pain rating scale had p-value = 0.01 and Lumbar Range of motion had p -value <0.05, which was considered significant.

Conclusion: McKenzie Method of mechanical diagnosis & therapy approach along with conventional physiotherapy showed better results in reducing intensity of back pain along with improvement in lumbar Range of motion. (Rawal Med J 202;46:224-227).

Keywords: Low back pain, manual therapy, lumbar vertebrae.

INTRODUCTION

Most individuals experience back pain episodes sometimes in life and these episodes can eventually develop to chronic back pain (LBP).[1] It's a complex multifactorial disorder and nearly 80-85% population can experience back issues during their lifetime[2] and 6-9% of young adults consult their physicians every year.[3] Although LBP is quite common and can be managed as "non-specific LBP" without any known cause. However, a highest quality level subgrouping plan for LBP is yet deficient in literature.[4] As symptoms expand, LBP changes from recent, sub-acute to constant and anticipation for recuperation decrease.[5]

LBP has strong association with obesity, smoking, lower middle class and sedentary life style.[6] WHO has been recommended to take measures to tackle back pain issues.[7] LBP comprises of three different sources of pain including referred pain, axial lumbosacral and radicular.[8,9]

The McKenzie strategy is well known among physiotherapists as management approach for spinal agony. It utilizes the concept of classifying back pain into different categories on the basis of causative agents and then treating each cause by directional preferences exercises adopting different positions depending upon patient's ease.[10] Patient is assessed and assigned into different categories based on the biomechanical musculoskeletal disorder. There are three types of syndromes according McKenzie classification.[11] The aim of this study was to compare effectiveness of mechanical diagnosis and therapy approach designed by McKenzie along with core stabilization exercises in patients of non-specific LBP.

METHODOLOGY

This quasi-experimental trial included 50 non-specific LBP and was conducted at Department of

Physical Therapy, Gosha-e-Shifa Hospital, Lahore & Institute of Rehabilitation Sciences, Foundation University, Islamabad, Pakistan. Sample size was estimated using G. Power software version 3.91 with 0.8 effect size measured by using (Mean± S.D) with α 5%, confidence interval 95% and power of study 80%. Written informed consent was taken from each patient. Patients having age range between 20-50 years of both gender and LBP were included in study. Patients with history of recent trauma with fracture, history of surgery in lumbar area, patients with spondylolisthesis, spondylolysis, spinal stenosis or any neurological disorders were excluded from study. Data collection was done by using convenient sampling technique & then divided into two groups. Group A participants were treated with McKenzie exercises for back pain depending upon directional preferences of patient's ease in symptoms along with conventional therapy and group B participants were treated with core stabilization exercises (Abdominal drawing-in-maneuver crunch, Quadruped alternate arm & leg, Supine shoulder bridge, Prone plank, Left horizontal side support and Right horizontal side support with 10 repetitions with 10 seconds hold) along with conventional therapy. Conventional therapy included Ultrasound therapy (at intensity 1.5 Watt/cm^2, frequency 1 MHZ on lumbar region for 7 to 8 minutes), Pelvic bridging and SLR. Each patient received 12 sessions, 4 times per week for 3 consecutive weeks.

Numeric Pain Rating Scale (NPRS) & Lumbar Range of Motion via Bubble Inclinometer were used as outcome measurement tools. NPRS is a patient self-report scale for measuring intensity of pain in the clinical and research settings having reliability from 0.67-0.96.[12] Patients verbally select a value on the scale of 0 to 10 (where 0 = no pain & 10 = worst pain) that is most in line with the intensity of pain that they have experienced in the past 24 hours. Lumbar forward bending, backward bending, Right & Left bending were measured with Bubble Inclinometer. Interrater and intrarater reliability for the inclinometer with Infraclass Correlation Coefficients of 0.90 and 0.85 for lumbar ROM.[13]

Statistical Analysis: Statistical analysis was performed using SPSS version 23. Tests of normality revealed non-normal data distribution so Mann Whitney U-test was applied for Between group comparisons. $p<0.05$ was considered significant.

RESULTS

Fifty eight participants were evaluated but 5 were excluded for not filling the required criteria & 3 declined to participate in this research. Thus, 50 were recruited, 0ut of which 60% were male and 40% female. Demographic details are shown in Table1.

Table 1. Characteristics of study participants according to gender, age, gait, duration of pain, night pain, profession and socioeconomic status.

Variable	Interventional Group (A) N=25		Control Group (B) N=25	
	No.	Percentage	No.	Percentage
Gender				
Male	15	60%	15	60%
Female	10	40%	10	40%
Age				
20-30 Years	9	36%	8	32%
30-40 Years	12	48%	11	44%
40-50 Years	4	16	6	24%
Gait				
Normal	20	80%	17	68%
Abnormal	5	20%	8	32%
Duration of Pain				
Acute	7	28%	5	20%
Sub-acute	5	20%	10	40%
Chronic	13	52%	10	40%
Night Pain				
Yes	11	44%	10	40%
No	14	56%	15	60%
Profession				
Working	16	64%	17	68%
Not working	9	36%	8	32%
Socioeconomic status				
Low	4	16%	3	12%
Middle	13	52%	15	60%
High	8	32%	7	28%

Table 2. Mann Whitney U Test for Between Group Comparison at NPRS & Lumbar ROM for Baseline and after 6th sessions.

Lumbar Range of Motion (ROM)	Group of Treatment	Median (IQR)	Mean rank	p-value
NPRS at Baseline	Group A	7.00(2)	23.76	**0.37**
	Group B	7.00(2)	27.24	
NPRS at 6th session	Group A	1.00(1)	20.72	**0.01**
	Group B	2.00(2)	30.28	
Lumbar Flexion at baseline	Group A	34.00(6)	18.98	**0.72**
	Group B	36.00(6)	32.02	
Lumbar Flexion at 6th session	Group A	48.00(8)	26.22	**0.02**
	Group B	48.00(12)	24.78	
Lumbar Extension at baseline	Group A	11.00(6)	22.98	**0.20**
	Group B	10.00(6)	28.02	
Lumbar Extension at 6th session	Group A	20.00(2)	32.52	**< 0.05**
	Group B	15.00(5)	18.48	
Lumbar Right Side Bending at Baseline	Group A	12.00(2)	22.68	**0.15**
	Group B	12.00(1)	38.32	
Lumbar Right Side Bending at 6th session	Group A	18.00(3)	31.58	**< 0.05**
	Group B	18.00(5)	19.42	
Lumbar Left Side Bending at Baseline	Group A	12.00(2)	23.66	**0.36**
	Group B	12.00(3)	27.34	
Lumbar Left Side Bending at Baseline	Group A	19.00(5)	33.44	**< 0.05**
	Group B	18.00(3)	17.56	

There was clinically as well as statistically significant difference observed in both groups in terms of back pain at NPRS along with improvement in Lumbar range of motion ($p< 0.05$). However, Group A participants showed better improvements as compared to Group B with $p<0.05$ (Table 2).

DISCUSSION

Low back pain is one of the leading cause of disability and absence from work.[14] Poor posture causes imbalance in musculoskeletal system. Proper posture reduces strain on muscles and related supporting structures by keeping the musculoskeletal system in balanced state and protects body from deformation forces.[15]

McKenzie method of mechanical diagnosis and therapy focus on the postural changes of the patient because of musculoskeletal imbalance which results from poor posture. MDT focuses on the biomechanical disorders arising because of poor posture.[16] The results of current study are consistent with previous study which reported that mechanical diagnosis and therapy approach and core stabilization exercises both are effective in alleviating pain and improving disability and functional status in non-specific LBP. Within group comparison, findings showed statistically significant difference between two groups which showed larger improvement in pain, disability and functional status.[17]

Current study also supported this systemic review by reporting reduction in pain intensity and improving lumbar range of motion having p values less than 0.05. Thus, McKenzie exercises has the potential to alleviate pain within short span of time. However, more treatment sessions are required for getting improvement in active lumbar range of motion. Hosseinifar et al in 2013 showed that after 18 sessions, there was pain reduction in both groups while improvement in disability score & muscular strength was seen only in stabilization training.[18]

CONCLUSION

Mechanical diagnosis and therapy approach and core stabilization exercises are effective in reducing back pain intensity on NPRS and improving lumbar range of motion in patients with non-specific LBP.

Author Contributions:
Conception and Design: Shoaib Kayani, Muhammad Mudassar Yasin
Collection and Assembly of data: Shoaib Kayani, Muhammad Mudassar Yasin
Analysis and interpretation of data: Arva Naeem
Drafting of the article: Shoaib Kayani
Critical revision of the article for important intellectual content: Ahmad Bilal Arif
Statistical Expertise: Arva Naeem, Syeda Rafia Mansoor
Final approval and guarantor of the article: Ayesha Majeed, Ahmad Bilal Arif
Corresponding author email:
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