The Effects of Mckenzie Exercsies for Patients with Low Back Pain, Our Experience

Emela Mujić Skikić, MD, MSc.
Trebinjac Suad, MD, PhD.
Visoka Zdravstvena škola, Sarajevo

Abstract

Objective: To investigate influence of McKenzie exercises on decreasing the pain in patients with low back pain, to show occurrence of Centralization sign, as a predictor of good treatment outcomes and to evaluate use of McKenzie exercises, as a routine method for lower back pain in Physical Medicine and Rehabilitation Centres.
Design: Clinical, prospective, manipulative study.
Setting: Physiotherapy and Rehabilitation Clinic in Community Based Rehabilitation Centers and Institute for Physical Medicine and Rehabilitation affiliated with a Medical College Sarajevo.
Participants: Thirty-four patients with symptoms of low back pain.
Interventions: McKenzie exercise program for low back pain were performed individually to the need and possibility of each patient. Patients attended exercise program daily, under supervision of physiatrist and physiotherapist and do it also at home, five times a day in series of 5 to 10 repetition each time, depending of stage of disease and pain intensity. The average training period was 15,5 days.
Main Outcome Measures: All patients were assessed before and after the treatment. Visual Analog Scale (VAS) measured intensity of pain, localization of pain was noted on special forms and Shober test was used to show differences in spinal movement before and after the treatment.
Results: Measurements of spinal movements and flexibility of spine showed significant improvement in all patients. Average difference in values of Shober test before and after treatment was 1,1 cm with SD 0,98. Difference test was t=6,263 with significant difference p<0,01. Mean pain intensity was reduced significantly as a result of treatment. Pain was reduced on VAS for X=2,8 with S.D. 1,56. Difference Test was t=10,332, with significant difference p<0.01.
61,5% of total number of participants had signs of centralisation (6% were in acute stage of pain, 32% in subacute and 23,5% in chronic pain). Centralisation sign was noted in 40% of acute patients, 57.5% subacute and 80% of chronic patients with a low back pain who exercised McKenzie program.
Conclusions: McKenzie exercises for low back pain are beneficial treatment for increasing flexibility of spine and improving the pain with better results in pain relief.
Although done by minimally trained physiotherapists in McKenzie approach, McKenzie exercises are successful method for decreasing and centralising the pain and increasing spinal movements in patients with low back pain.
Key Words: McKenzie exercises; Low Back Pain; Pain measurements; Centralisation

Introduction

Low back pain is the most frequent reason for decreased activity of population under 45 years of life, fifth most frequent reason for hospitalisations and third reason for surgical interventions. Back pain affects up to 75% of adult population at some time of their lives and this problem accounts for 15% of sick leaves (1,2,3,4).
About 84% of patients with low back pain ask for medical help, and from that number 31% are referred on hospitalisation and 12% on surgical interventions. 75% - 85% of patients have improvement with standard, no surgical treatment (5).
One of exercises programs for low back pain can be McKenzie approach that consists of six specific exercises, in certain positions (laying in prone position, standing, laying in supine position and sitting), which gradually increasing pressure on vertebra. During this exercise program postural correction is needed as well as observation of all changing in pain intensity and location. McKenzie exercise program can start in acute pain and performed in all pain stages. It is not allowed to feel any leg pain during exercising, and if that happened, patients have to do the previous exercise. These exercises can be called self-manipulation exercises and it has to be done in small session but frequently, during the day. Number of session and daily frequency depends of stage of disease and pain intensity (6,7,8,9,10).
If there are any decreasing the pain and changing in pain location during the exercising, from legs to lower back, than we can talk about Centralisation sign. Presence of this sign is a strong indicator of discogenic pathology and a highly accurate and reliable predictor of treatment outcome.
Many scientific studies showed that patients with centralisation phenomena have very good chances for fast and complete recovery. Some studies showed that all patients who had complete pain absence and functional recovery after kinesitherapy treatment, showed centralisation of back pain in early beginning of exercise program. Whatever the exact mechanism is, the key clinical

significance of centralization is its value as a prognostic indicator, for which some evidence has been published (11,12,13,14,15,16,17,18)
Non occurrence of centralization outcome reliably predicts poor treatment outcome and was a helpful early predictor of the need for surgical treatment (13).
Centralization can help identify sub-groups within the population with chronic low back pain and could be useful goal setting and case management tool in the rehabilitation of low back pain (L14).
The purpose of this study is to investigate influence of McKenzie exercises on decreasing the pain in patients with low back pain, as well as to show occurrence of Centralization sign, as a predictor of good treatment outcomes. Our aim was also, to evaluate use of McKenzie exercises, as a routine method for lower back pain in Physical Medicine and Rehabilitation Centres.

Methods

Participants

Thirty-four patients with symptoms of low back pain were included in study, which was approved by the Ethics Committee of the Sarajevo University Faculty of Medicine. Patients were recruited from Physical Medicine and Rehabilitation outpatient Clinic in Community Based Rehabilitation Centers in Sarajevo and from University Clinical Center Sarajevo - Institute for Physical Medicine and Rehabilitation. Subjects were referred for physiotherapy treatment from Primary Health Care physicians or from specialist Clinic (orthopedic, traumatology, neurology etc). Patients were included in study if they had symptoms of lower back pain, without any motor or sphincter deficit. Professionals who had minimal training in McKenzie mathod did instruction for exercises and supervision of patients.

Measures

All patients were assessed before and after the treatment. Visual Analog Scale (VAS) measured intensity of pain, localization of pain was noted on special forms and Shober test was used to show differences in spinal movement before and after the treatment.
Visual Analog Scales were measured and recorded as numeric rating scales (0-10). VAS was given to each subject to show his pain intensity on scale graded from 0 to 10, where grade 0 means that patient doesn't have a pain and grade 10 is sign for the worst possible pain. The patient marks a certain length of this line that was equivalent to the intensity of pain experienced. The distance of this mark from "no pain" end of the scale was measured.

Localization of pain was noted on special design forms, on each assessment time, to notice any changing in pain distribution and to see if there are signs of centralization of pain.

Shober test was used for measuring flexibility of spine. While patient was in standing position, a horizontal line on the level of edge of iliac bones was marked, and second line 10 cm proximal and parallel with first one. In normal spinal condition, this space increasing for 5 centimeters more, so difference between lines will be 15 centimeters. If patient has pain in lower back, his spinal movements are limited by pain, and Shober test has decreased values. Shober test values before and after the treatment can show results of treatment.

Exercise Therapy

McKenzie exercises were performed individually to the need and possibility of each patient. Patients attended exercise program daily, under supervision of physiatrist and physiotherapist in the Clinic for Physiotherapy and Rehabilitation, and they were asked to do same exercise program at home five times a day in series of 5 to 10 repetition each time, depending of stage of disease and pain intensity. Type of exercises and number of repetition was created individually for each patient. All exercises were followed by correction of body posture.

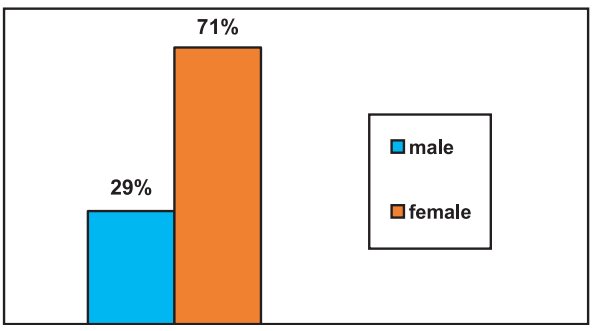
Statistics

Results were expressed as mean +/- *SD*. Differences in group means were examined by *Student t- test*.

Results

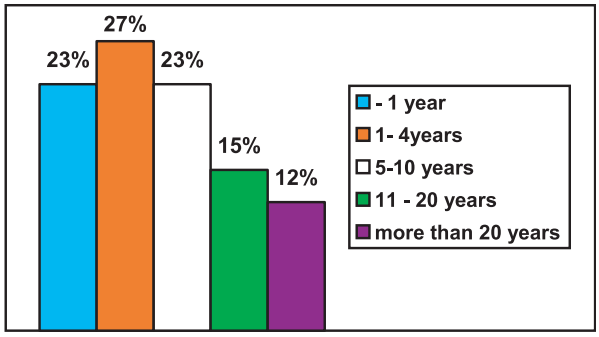
A total of 10 men (29%) and 24 women (71%) participated in this study. Mean age was 50 years (+/- 10,8 years) - error of 1,83. (Figure 1.)

Figure 1. Gender structure of participants who exercised McKenzie program for low back pain



23% of patients experienced first symptoms of lower back pain in the year of assessment, 27% has 4 years experience of pain, 23% 10 years and 27% more than 10 years. (Figure 2.)

Figure 2. First symptoms of low back pain in participants in the study

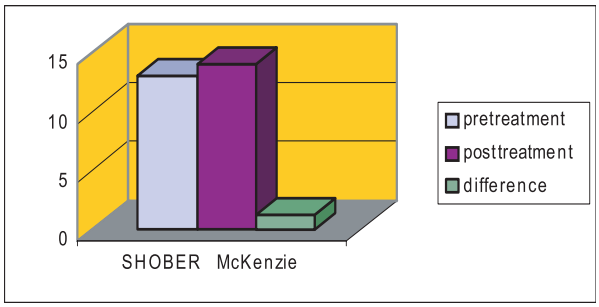


Patients received a mean of 15,5 treatments with standard deviation of 8,95. One patient didn't complete the treatment. No adverse effect occurred.
Thus, 33 patients were enrolled to the statistical analysis.

Data analysis

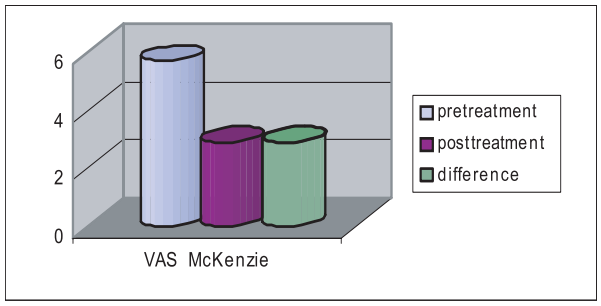
Measurements of spinal movements and flexibility of spine showed significant improvement in all patients with lower back pain after exercising McKenzie program
Average measurements (X) for Shober test before treatment were 12,7 with standard deviation (SD) 1,17 were increased after treatment to X =13,8 and SD 1,06.
Average difference in values before and after treatment was 1,1 cm with SD 0,98. Difference test was t=6,263 with significant difference p<0,01. (Figure 3.)

Figure 3. Shober test before and after McKenzie exercises in patients with low back pain



Mean pain intensity was reduced significantly as a result of treatment.
Pain intensity pre- treatment, on VAS was in average X=5,7, with S.D. 2,84 and at the end of treatment was decreased to X=2,9 with S.D. 2,24.
Pain was reduced on VAS for X=2,8 with S.D. 1,56.
Difference Test was t=10,332, with significant difference p<0.01. (Figure 4.)

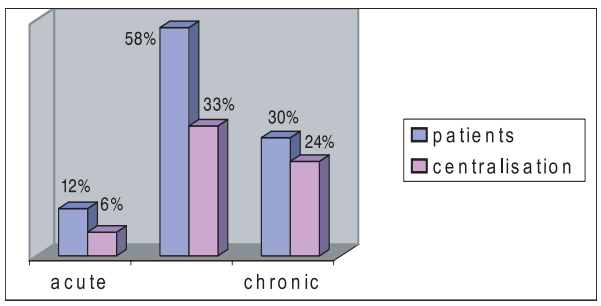
Figure 4. Pain intensity measured by Visual Analog Scale (VAS) before and after McKenzie exercises in patients with low back pain



Comparing pre-treatment and post-treatment data in all participants, it was found that among 33 patients who did McKenzie exercise program for low back pain 5 patients didn't have any improvement in spinal flexibility, so values of Shober test were same before treatment and after the treatment for 15% of participants in this study.
Intensity of pain (VAS) showed that all 33 patients who exercises McKenzie program for low back pain had some kind of pain relief (100%).
Results in this study showed that McKenzie exercises for low back pain was beneficial for participants in our study for both - flexibility of spine and pain relief, but more subjects had improvement in pain.

According to Quebec Task Force of Spinal Disorders all patients were grouped in 3 groups: acute stage of disease -pain less than 7 days, subacute stage - pain from 8 days to 7 weeks and chronic stage - pain more than 7 weeks. There were 15% of our participants in acute pain, 55,5% in subacute and 29,5% in chronic pain.

Figure 5. Centralisation sign after McKenzie exercise program for patients with low back pain



Patients' symptomatic response on exercises was measured, with special attention to whether the pain is centralises or not. (Centralisation occurs when pain from the leg moves up to the buttocks and further to the back.)

61,5% of total number of participants had signs of centralisation (6% were in acute stage of pain, 32% in subacute and 23,5% in chronic pain).
Centralisation sign was noted in 40% of acute patients, 57.5% subacute and 80% of chronic patients with a low back pain who exercised McKenzie program. (Figure 5.)

Discussion

This study investigated use of McKenzie exercises for the treatment of patients suffering from lower back pain and it's influence on pain relief, spinal movements and changing in pain distribution from distal to the midline of the spine (centralisation sign).
Treatment consisted of one session of exercises daily under supervision of professionals and recommendation for few more sessions at home, depending of pain intensity and general medical conditions of patient. As was recommended, treatment also focused on correcting of body posture.
Pain was the most impairing symptom in this patients' sample and each patient experienced pain before treatment, average rate on VAS was 5,7 before treatment (on 10 rate VAS). After treatment a significant pain reduction occurred. Comparing pre-treatment and post-treatment results, all participants in this study have pain relief with a difference in VAS of 2,8.
Spinal movements and elasticity of spine, measured by Shober test, also showed significant improvement at the end of treatment comparing with pre-treatment measurements, with average difference of 1,1 cm.
Results of this study confirming that McKenzie exercises are beneficial for patients with lower back pain and they are producing significant reduction in pain intensity and improvement in spinal motion.
These results are similar with results of many other studies (4,19,20) that investigate McKenzie exercises and their benefit for the patients. More participants in our study have benefit in pain relief than in flexibility of spine.
Previous studies have found that centralisation phenomenon can be reliable predictor of good or excellent treatment outcome (12,13,14,15,16,17,18,19).
According to Quebec Task Force all patients were divided in to 3 groups and we investigate centralisation phenomenon between groups (21). Huge number of our patients was in subacute stage, than in chronic stage, and minor number of participants was in acute stage of disease.
In previous studies (16,19) there was much more patients in acute stage of disease comparing with our results were we have majority of subacute and chronic patients. Reason for this difference can be organisation of health system in our country and fact that patients were referred for physiotherapy treatment from primary care physicians or from specialist clinic, and all of them were on some kind of conservative treatment before coming to us (bed rest, medicaments etc.) without any advice of exercise treatment and postural corrections (22, 23, 24, 25, 26, 27).
Of 33 patients 61,5% have centralisation signs within 14 days of period (40% of acute, 58% subacute and 80% chronic patients).
The limitation of this study, in comparison with previous researches, was that McKenzie exercise program was done by minimally trained physiotherapist in McKenzie, all patients with lower back pain who came to physiotherapy treatment were included in study and a lot of them without advanced diagnostic methods (CT scan, MRI) of spinal condition.

Conclusion

McKenzie exercises for low back pain are beneficial treatment for increasing flexibility of spine and improving the pain with better results in pain relief.
61,5% of total number of participants with a low back pain who exercised McKenzie program had signs of centralisation and among them 40% was in acute pain, 57.5% in subacute and 80% in chronic pain.
Although done by minimally trained physiotherapists in McKenzie approach, McKenzie exercises are successful method for decreasing and centralising the pain and increasing spinal movements in patients with low back pain.

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