ORIGINAL PAPER

doi: 10.5455/medarh.2018.72.267-271
MED ARCH. 2018 AUG; 72(4): 267-271
RECEIVED: FEB 02, 2018 | ACCEPTED: JUL 30, 2018

Influence of Motion Therapy in the Prevention of Lumbar Pain Syndrome Relapse

Eldad Kaljic[1], Dijana Avdic[1], Emira Svraka[1], Mirsad Muftic[1], Muris Pecar[1], Amra Macak-Hadziomerovic[1], Namik Trtak[1]

[1]University of Sarajevo, Faculty of Health Studies, Bolnička 25, Sarajevo, Bosnia and Herzegovina

Corresponding author: Eldad Kaljic, MD. University of Sarajevo, Faculty of Health Studies, Bolnička 25, Sarajevo, Bosnia and Herzegovina. ORCID ID: http//www.orcid.org: 0000-0001-8020-1029. E-mail: ekaljic@gmail.com

ABSTRACT

Introduction: Lumbar pain syndrome is one of the most common conditions in clinical practice, more common than 290 other pathological conditions, which affect up to 84% of adults in a certain period of their life. The origin of the lower back pain can be classified as mechanical, neuropathic and secondary due to another illness. Patient education and information, muscle strengthening exercises, maintenance of routine daily physical activity and pain therapy are the basis of acute non-specific pain syndrome therapy. **Aim:** To determine the success of the motion therapy procedure in the prevention of lumbar pain syndrome relapse. **Material and methods:** The research is prospective, longitudinal, manipulative and controllable. It was conducted in the private practice "Praxis - dr. Pecar" in the period from June 20, 2014 to June 1, 2016, and included 200 respondents with symptoms of lumbar pain syndromes divided into the experimental (n=100) and control (n=100) groups. The presence of lumbar pain syndrome relapse in respondents experimental and control group was recorded in the second and third clinical examination. **Results:** In the second examination, 4 (4%) of the respondents from experimental group and 37 (37%) of the control group responded had LBS relapse. In the third examination, the number of respondents with recurrent LBS in the experimental group was 4 (4%), while in the control group was 17 (17%). After the study, no statistically significant difference was observed in the mean age of respondents who had LBS relapse compared to respondents without LBS relapse, as well as significant influence of sex structure on relapse in the experimental and control group during the second and third examination. **Conclusion:** After the second examination, the relapse rate in the experimental group was statistically significantly higher in the respondents withstanding jobs, while there was no statistically significant difference in the control group and both groups after the third examination.

Keywords: relapse prevention, lumbar pain syndrome, motion therapy.

1. INTRODUCTION

Lumbar Pain Syndrome (LBS) is defined as the pain or discomfort of the posterior part of the body, localized between the margin of the twelve ribs and the lower gluteal region with or without the extension of the lower extremities, which may be serious to the extent that is limiting the usual activities for more than one day (1, 2, 3).

It is documented as a very common health problem and represents the leading cause of activity limitation, disability, loss of productivity and absenteeism in the vast part of the world, leading to enormous economic burdens for the individual, family, community, industry and government. Ten years ago, it was considered a problem limited to Western countries. However, since then, a large number of studies have shown that lower back pain is a major problem in countries with middle and lower levels of development (4, 5).

Lumbar pain syndrome is one of the most common conditions in clinical practice, in front of 290 other pathological conditions, which reach up to 84% of adults in a certain period of their life. It can have a major negative impact on the quality of life and function, and is often associated with depression and anxiety (6, 7).

The origin of the lower back pain can be classified as mechanical, neuropathic and secondary due to another illness. Mechanical back pain implies that the source of pain originates from the spine or its associated structures. Neuropathic pain indicates the presence of symptoms is due to spinal nerve root irritation. There are several ways to distinguish mechanical from neuropathic pain in the lower back when taking an an-

amnesis. Patients often describe radicular pain as flaking or scavenging, while bone-muscular as pain due to the impact or long-lasting pain. Mechanical pain can often be transmitted to the gluteus and upper leg, while the pain below the knee is less frequent than the radicular pain (8, 9).

Pain in the lumbosacral area is a primary symptom of lumbar pain syndrome, which may vary in the range of intensity from dull, constant pain to sudden, severe pain that causes the disability. Pain can develop abruptly as a result of an accident or lifting of the load, or during longer time due to age changes in spinal cord. Localization of pain may be limited to the lumbar spine or spread over the front, side or back side of the leg. It is aggravated by increased activity and occasionally at night or by prolonged sitting. In addition to pain, people with lumbar pain syndrome may feel numbness or weakness in the part of the leg innervated by the affected nerve (10, 11).

Evaluation of lumbar pain syndrome implies taking of complete and focused medical history and physical examination to determine the cause of the symptoms. Responses and findings of a patient may cause doubts about the existence of a serious underlying disease. In the absence of these, there is no need for special examinations as most patients spontaneously recover. Radiological examinations of lumbar spine and other diagnostic procedures are used in cases where it is necessary to confirm the specific pathology of lumbar pain syndrome after thoroughly taken medical history and physical examination (12).

The condition of most people with an acute episode of back pain is spontaneously improving to a degree sufficient to return to work over a period of the first two weeks. The probability of relapse in the first-year ranges from 30% to 60%. In one third of people, the initial episode of pain in the lower back lasts for the one year (13, 14).

Patient education and information, maintenance of routine daily physical activity and pain therapy are the basis of acute unspecific pain syndrome therapy. For the purpose of preventing chronicity, early identification of the parameters for prediction of high risk of chronicity is of particular importance, even in primary health care (15).

Exercise therapy involves a heterogeneous group of interventions. They can be individual or for individual groups of patients, under the supervision of a therapist or in-home conditions. They can be performed with different exercise machines or in the pool. Different types of exercises are used, such as: stretching exercises, stabilization, balance and coordination, then aerobic, and flexion exercises. For muscle strengthening exercises, special attention is given to specific muscles (m.multiphase, m. transversus abdominis) or muscle groups, such as trunk and abdominal muscles. Exercises can vary in intensity, frequency and duration (16).

2. AIM

Determine the success of the motion therapy procedure in preventing lumbar pain syndrome relapse.

3. MATERIAL AND METHODS

The research is prospective, longitudinal, manipulative and controllable. It was conducted in the private practice "Praxis - dr. Pecar" in the period from June 20, 2014 to June 1, 2016. In total 200 respondents were diagnosed with symptoms of lumbar pain syndrome of which, according to the criteria for inclusion in the study, were divided into two groups: experimental (n=100) and control (n=100). In the examined group, the respondents of the sitting occupations were engineers, economists, teachers, officers, lawyers and doctors, while respondents of standing professions were physical workers. The respondents in the control group's sitting occupations were engineers, economists, teachers, officers, lawyers and veterinarians, while physical workers were respondents from standing occupations.

Inclusion criteria

- Respondents of both genders, 30 to 50 years of age, sitting and standing occupations who started treatment in the private practice "Praxis - dr. Pecar" due to various manifestations of lumbar pain syndrome (lumbar, referral and radicular pain).
- Clinical examination verified lumbar pain syndrome.
- Respondents who had been evaluated by clinical examination before being included in the study.

Exclusion criteria

- Respondents under 30 or over 50 years of age.
- Respondents who did not undergo a clinical review at the first examination.
- Discontinuation of treatment.
- Non-compliance with the therapeutic protocol.
- The presence of relapse of lumbar pain syndrome in respondents of experimental and control groups was recorded in the second and third clinical examination.
- Treatment of respondents of the experimental group included an educational program of exercises:
- Exercises to increase spinal cord mobility;
- Exercises for strengthening the front abdominal muscles;
- Exercises for strengthening the side abdominal muscles and
- Exercises to strengthen the muscles of the back.

In respondents with acute lumbar pain syndrome, exercise treatment began two weeks after the occurrence of symptoms, to help reduce pain intensity. For respondents with subacute and chronic form of lumbar pain syndrome treatment exercises started immediately after a clinical examination.

Treatment of respondents in the control group consisted of clinical examination and one-time treatment of mobilization and manual massage of the lumbar spine or one-time treatment of the lumbar spine and local instillation of the corticosteroid depot without carrying out an educational program of exercises.

The database is compiled in Microsoft Office Excel 2013 and contains the data obtained during the survey. After checking the integrity of the data, statistical analy-

sis was performed in statistical software IBM SPSS Statistics v. 20.0 for Windows.

4. RESULTS

After the second examination, 4 (4%) of the respondents in the experimental and 37 (37%) of the control group had LBS relapses (p=0.001). After the third examination, the same number of respondents with LBS relapses remained 4 (4%) in the experimental, while in the control group the number decreased by 17 (17%) (p = 0.002).

Using ANOVA, no statistically significant difference in the average age of respondents with LBS relapse was established in comparison to respondents who did not have LBS relapse in both groups during the second and third examination.

Using the chi-squared test, no statistically significant influence of the gender was determined on the occurrence of relapse in the experimental and control group during the second and third examination.

After the second examination, the relapse rate in the experimental group was statistically significantly higher in the respondents who performed their work standing in relation to the respondents who performed the work sitting, $\chi2=5.882$; p=0.042. In the control group during the second examination, and in both groups during the third examination, no statistically significant difference in relapse frequency was determined in relation to the type of occupation.

EXAMINATION				GROUP		TOTAL
				Experimental	Control	
I examination	Relapse	No	N	100	100	200
			%	100%	100%	100%
II examination	Relapse	Yes	N	4	37	41
			%	4%	37.0%	20.5%
		No	N	96	63	159
			%	96%	63%	79.5%
	$\chi2=33.243$; p=0.001					
III examination	Relapse	Yes	N	4	17	21
			%	4%	17%	10.5%
		No	N	96	83	179
			%	96%	83%	89.5%
	$\chi2=8.947$; p=0.002					

Table 1. Frequency of LBS relapse in both groups

EXAMINATION	GROUPS		N	Mean	SD	SEM	Min.	Max.
II examination	Experimental	Yes	4	33.00	2.44	1.22	30.00	36.00
		No	96	39.45	6.56	.67	30.00	50.00
		F=3.812; p=0.054						
	Control	Yes	37	41.64	6.41	1.05	30.00	50.00
		No	63	40.80	7.10	.89	30.00	50.00
		F=0.349; p=0.556						
III examination	Experimental	Yes	4	41.50	9.81	4.90	33.00	50.00
		No	96	39.10	6.46	.65	30.00	50.00
		F=0.508: p=0.478						
	Control	Yes	17	40.00	7.92	1.92	30.00	50.00
		No	83	41.34	6.62	.72	30.00	50.00
		F=0.547; p=0.461						

Table 2. Influence of age on the occurrence of LBS relapse

EXAMINATIONS	GROUPS				Relapse		Total
					Yes	No	
II examination	Experimental	Gender	Male	N	2	49	51
				%	50%	51%	51%
			Female	N	2	47	49
				%	50%	49%	49%
		$\chi2=0.967$; p=0.676					
	Control	Gender	Male	N	23	42	65
				%	62.2%	66.7%	65%
			Female	N	14	21	35
				%	37.8%	33.3%	35%
		$\chi2=0.207$; p=0.404					
III examination	Experimental	Gender	Male	N	3	48	51
				%	75%	50%	51%
			Female	N	1	48	49
				%	25%	50%	49%
		$\chi2=1.006$; p=0.324					
	Control	Gender	Male	N	12	53	65
				%	70.6%	63.9%	65%
			Female	N	5	30	35
				%	29.4%	36.1%	35%
		$\chi2=0.278$; p=0.408					

Table 3. Impact of gender on the occurrence of LBS relapse

EXAMINATION	GROUPS				Relapse		Total
					Yes	No	
II examination	Experimental	Occupation	Standing	N	3	21	24
				%	75%	21.9%	24%
			Sitting	N	1	75	76
				%	25%	78.1%	76%
		$\chi2=5.882$; p=0.042					
	Control	Occupation	Standing	N	16	30	46
				%	43.2%	47.6%	46%
			Sitting	N	21	33	54
				%	56.8%	52.4%	54%
		$\chi2=0.180$; p=0.415					
III examination	Experimental	Occupation	Standing	N	0	24	24
				%	0%	25%	24%
			Sitting	N	4	72	76
				%	100%	75%	76%
		$\chi2=2.248$; p=0.327					
	Control	Occupation	Standing	N	5	41	46
				%	29.4%	49.4%	46%
			Sitting	N	12	42	54
				%	70.6%	50.6%	54%
		$\chi2=2.246$; p=0.107					

Table 4. Influence of the type of occupationon the occurrence LBS relapse

5. DISCUSSION

By the analysis of the results in the tested groups is determined the occurrence of LBS relapse in relation to the investigated groups, then the age, sex and occupation of the respondents.

Frequency of relapse of LBS compared to the tested groups in the second and third examination showed statistically significant difference. In the second examination, 4 (4%) of the respondents in experimental and 37 (37%) of the control group respondents had LBS relapse. In the third examination, the number of respondents with LBS relapse in the experimental group was 4 (4%), while in the control group it was 17 (17%). During the second and third examination there was a statistically significant difference in relation to the investigated groups.

Steffens D. et al. (2016) conducted a systematic review and meta-analysis of randomized clinical studies on strategies for the prevention of non-specific LBS. The retrieval from electronic databases (MEDLINE, Embase, Physiotherapy database scale and Cochrane central register of controlled trials) was carried out by November 2014. The primary instrument of the study was the appearance of an LBS episode, and the secondary period of absence from work due to LBS. The study included 23 studies, and it was established that exercises were either alone or in combination with education effective in preventing LBS (17).

ANOVA test determined that in neither of the investigated groups exist statistically significant difference in the average age of respondents who had relapse of LBS compared to respondents who did not have LBS relapse, either in the second and third examination. In the experimental group during the second examination, the mean age-related relationship between respondents who did not and who have an LBS relapse was 33 to 39.45 years, while in the control group the ratio was 41.64 to 40.80 years. In the third examination, the average age of respondents in the experimental group who had LBS relapse was 41.50 years, while respondents who did not have LBS relapse was in mean age of 39.10 years. In the control group, 40 years of age were the average age of respondents who had relapse and 41.34 years of age who did not have LBS relapse.

Gender structure of the respondents who had LBS relapse during second examination was consisted of 2 (50%) male 2 (50%) female respondents in the experimental group and 23 (62.2%) male and 14 (37.8%) female respondents in the control group. 49 (51%) male and 47 (49%) female respondents in the experimental group and 42 (66.7%) male and 21 (33.3%) female respondents in the control group did not have an LBS relapse. During the third examination in the experimental group 3 (75%) male and (25%) female respondents had an LBS relapse, while 48 (50%) male and 48 (50%) female respondents did not have and LBS relapse. Gender structure of the control group respondents who had an LBS relapse was consisted of 12 (70.6%) male and 5 (29.4%) female respondents. LBS relapse did not have 53 (63.9%) male and 30 (36.1%) female respondents. Using the chi-square test, no statistically significant influence of the sex on the occurrence of relapse in the experimental and control group was established during the second and third examination.

The results of the influence of occupation on LBS relapse showed that there was statistically significant more LBS relapses among the respondents in the standing occupations, 3 (75%), compared to the respondents of the sitting occupations, 1 (25%). There was no significant difference in the relapse of LBS compared to standing and sitting occupations (43.2% and 56.8%) in the control group. During the third examination, no statistically significant difference in the incidence of LBS relapse compared to the occupation in both groups was determined.

6. CONCLUSIONS

Conclusions based on results of relapse prevention and reduction of lumbar pain syndrome are:

The analysis of the results of the relapse of lumbar pain syndrome showed a lower incidence of relapse in respondents in the second and third examination in experimental compared to the control group.

By assessing the risk of lumbar pain syndrome by means of the Keele University "STarT Back Screening Toolkit" questionnaire, it was established at the end of the study that the respondents of the experimental group had a significantly lower LBS risk compared to the control group.

Analysis of the results at the end of the study found that the sex and age structure of the respondents had no effect on the relapse, while the respondents who performed the work in the standing position had more frequent recurrent lumbar pain syndrome.

- **Author's contribution:** all authors were included to all phases of preparation this article. Final proof reading made by the first author.
- **Conflict of interest:** none declared.

REFERENCES

1. Karunanayake AL.Risk factors for chronic low back pain. Community Medicine & Health Education. 2014; 4(2): 1-4.
2. Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, Williams G, Smith E, Vos T, Barendregt J, Murray C, Burstein R, Buchbinder R. Extended report: The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. Annals of the Rheumatic Diseases. 2014; 73(6): 968-974.
3. Hayden JA, Tougas ME, Riley R, Iles R, Pincus T. Individual recovery expectations and prognosis of outcomes in nonspecific low back pain: prognostic factor exemplar review. Cochrane Database of Systematic Reviews. 2014; 9: 1.
4. Hoy D, Brooks P, Blyth F, Buchbinder R. The Epidemiology of low back pain. Best Practice & Research Clinical Rheumatology. 2010; 24: 770.
5. Barr KP, Harrast MA. Low back pain. In: Braddom R. (Ed). Physical medicine & rehabilitation (fourth edition). Elsevier Saunders. 2011: 871-911.
6. Agency for Healthcare Research and Quality (AHRQ). Noninvasive treatments for low back pain. AHRQ, U.S. Department of Health and Human Services. 2014; 1.
7. Buchbinder R, Blyth FM, March LM, Brooks P, Woolf AD, Hoy DG. Placing the global burden of low back pain in context. Best Practice & Research: Clinical Rheumatology. 2013; 27(5): 575-589.
8. Braun J, Baraliakos X, Regel A, Kiltz U. Assessment of spinal pain. Best Practice & Research Clinical Rheumatology.2014; 28(6): 875-887.

9. Cohen SP, Argoff CE, Carragee EJ. Management of low back pain. British Medical Journal. 2009; 338: 100-106.
10. Arya RK. Low back pain – signs, symptoms, and management. Journal, Indian Academy of Clinical Medicine.2014; 15(1): 30-41.
11. National Institute of Neurological Disorders and Stroke. Low back pain. National Institutes of Health, U.S. Department of Health and Human Services. 2014; 15-5161: 1-28.
12. Valdecañas CM, Fidel MBCC, Grimmer-Somers K, Dizon J, Luker J, Aycardo SMO, Beredo MEJ, Cabungcal EN, Cembrano RMJ, Cunanan MRP, Dizon EC, Gambito EDV, Gonzalez-Suarez CB, Macalintal JC, King E. Low back pain management guideline. Philippine Academy of Rehabilitation Medicine. 2012; 18.
13. Goertz M, Thorson D, Bonsell J, Bonte B, Campbell R, Haake B, Johnson K, Kramer C, Mueller B, Peterson S, Setterlund L, Timming R. Adult acute and subacute low back pain. Institute for Clinical Systems Improvement. 2012: 8.
14. Amorin-Woods LG, Beck RW, Parkin-Smith GF, Lougheed J, Bremner AP. Adherence to clinical practice guidelines among three primary contact professions: a best evidence synthesis of the literature for the management of acute and subacute low back pain. The Journal of the Canadian Chiropractic Association. 2014; 58(3): 220-237.
15. Rudwaleit M, Märker-Hermann E. Management of nonspecific low back pain. The new national guidelines 2011. Zeitschrift für Rheumatologie. 2012; 71(6): 485-497.
16. Lizier DT, Perez MV, Sakata RK. Exercises for treatment of nonspecific low back pain. Revista Brasileira de Anestesiologia. 2012; 62(6): 838-846.
17. Steffens D, Maher CG, Pereira LS, Stevens ML, Oliviera VC, Chapple M, Teixeira-Salmela LF, Hancock MJ. Prevention of low back pain: a systematic review and meta-analysis. JAMA Internal Medicine. 2016; 176(2): 199-208.