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Efficiency of trunk stabilizing exercises in treatment of patients with lumbar pain syndrome

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ABSTRACT

Introduction: Lumbar pain syndrome is the most common cause of temporary work disability in people under 45 years of age. The aim of this study was to detect the frequency of acute and chronic lumbar pain syndrome in people of both gender, different age structures, different occupations and in active working population, and to determine the efficiency of trunk stabilizing exercises in its treatment.

Methods: We analyzed 27 patients with acute and 33 patients with chronic lumbar pain syndrome from 01.01.2010 to 31.12.2012 which undergone trunk stabilizing exercises. We evaluated and scored 0 to 5 the condition of respondents before treatment and after the treatment.

Research results: The mean score of condition of respondents with acute lumbar pain syndrome before therapy is 2.96, whereas after treatment is 4.71. The mean score of condition of respondents with chronic lumbar pain syndrome before therapy is 3.76, whereas after treatment is 4.63.

Conclusion: Treatment with trunk stabilizing exercises performed in the clinic "Praxis" leads to improved scores of condition of respondents after treatment.

Keywords: Trunk stabilizing exercises, lumbar pain syndrome, treatment.

INTRODUCTION

Lumbar pain syndrome is the most common cause of temporary work disability in people under 45 years of age (1). In most of the patients the condition is followed by work disability and the need for adequate medical treatment (2). It is defined as pain in the area between the 12th thoracic rib and gluteal segment, with or without radiation to the lower extremities (3). It is the second leading cause of pain occurrence (4). If the aforementioned symptomatology lasts less than 6 weeks, then the lumbar pain syndrome is acute. Duration from 6 to 12 weeks indicates the subacute stage, while over 12 weeks is chronic stage (5).

Diagnosis is based on medical history, clinical examination, tests for evaluation of functional status and radiological verification. Treatment can be conser-

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vative (pharmacological and physical therapy), surgical and combined (manual and pharmacological therapy, bed rest, physical therapy and acupuncture).

In addition to the treatment of syndrome causes, it is necessary to reduce the risk of re-occurrence with trunk stabilizing exercises leading to the strengthening of the hull muscles and improvement of functional status of patient (6). Effects of trunk musculature exercises are reflected in the reduction of pain and disabilities caused by syndrome and in improvement of function of the lumbar spine (7, 8). Studies show that educational programs for exercises significantly improve functional status of office workers (9).

The aim of this study was to detect the frequency of acute and chronic lumbar pain syndrome in people of both gender, different age structures, different occupations and in active working population, and to determine the efficiency of trunk stabilizing exercises in their treatment.

METHODS

Patients

The study included 27 patients with diagnosis of acute lumbar pain syndrome and 33 patients with diagnosis of chronic lumbar pain syndrome who were treated in the clinic "Praxis" in the period from 01.01.2010 to 31.12.2012 year. The patients were of both gender, different age groups and active working respondents of 15 different professions: doctor, veterinarian, teacher, engineer, lawyer, economist, official, laborer, craftsman, farmer, housewife, retired, pupil, student and others. Criteria for inclusion of the respondents in the study: the research included respondents of both gender, different age groups and active working respondents of 15 different professions treated in the mentioned period and with verified lumbar pain syndrome (clinical examination, radiological tests) and estimated condition before treatment (clinical examination). Criteria for exclusion of the respondents in the study were patients without estimated condition after treatment, those who left treatment or did not abide by the treatment protocols.

Research methods

The study was conducted as a retrospective, analytical, non-experimental before-and-after study. Data were obtained from a special software program which is used for collecting and analyzing the variables needed for research.

Condition of respondents before and after treatment was estimated by the following methodology:

0 - immobile
1 - difficult mobility with the assistance of someone else
2 - difficult mobility with the help of aids
3 - satisfactory functional status and capable of everyday activities
4 - good functional status
5 - normal functional status for every day life activities and work (10).

Method of treatment of lumbar pain syndrome in the clinic "Praxis" consists of trunk stabilizing exercises which include:

- trunk stretching exercises
- exercises to strengthen ventral abdominal musculature
- exercises to strengthen lateral abdominal musculature
- exercises to strengthen the back musculature

Research results were estimated by the following methodology:

0 - condition remains unaffected

2 - minimal improvement

3 - satisfactory improvement with the consequences of injury or illness

4 - good improvement with satisfactory functional restitution

5 - good functional restitution without sequel

6 - left treatment

7 - further medical treatment, diagnostic or surgical, is required (10).

Statistical analysis

In this research, we used the percentages of representation and the mean values of condition of respondents before and after treatment.

RESULTS

TABLE 1. Gender and age structure of respondents with acute lumbar pain syndrome

Age structure of respondents (years)	Gender structure		Total	Percentage of representation
	Male	Female		
25 - 34	4	1	5	18.51%
35 - 44	3	8	11	40.74%
45 - 54	3	2	5	18.51%
55 - 64	2	1	3	11.11%
Over 65	2	1	3	11.11%
Total	14	13	27	100%

TABLE 2. Gender and age structure of respondents with chronic lumbar pain syndrome

Age structure of respondents (years)	Gender structure		Total	Percentage of representation
	Male	Female		
25 - 34	1	6	7	21.21%
35 - 44	2	2	4	12.12%
45 - 54	3	5	8	24.24%
55 - 64	5	2	7	21.21%
Over 65	2	5	7	21.21%
Total	13	20	33	100%

TABLE 3. Structure of the respondents according to occupation - Acute lumbar pain syndrome

Sequence no. of occupation	Type of occupation	No. of respondents	Percentage of representation
1	Doctor	1	3.70%
2	Veterinarian	0	0 %
3	Teacher	0	0%
4	Engineer	2	7.40%
5	Lawyer	4	14.81%
6	Economist	5	18.51%
7	Laborer	0	0%
8	Farmer	0	0%
9	Official	10	37.04%
10	Craftsman	0	0%
11	Housewife	1	3.70%
12	Pupil	0	0%
13	Student	1	3.70%
14	Retired	2	7.40%
15	Others	1	3.70%
	Total	27	100%

TABLE 4. Structure of the respondents according to occupation - Chronic lumbar pain syndrome

Sequence no. of occupation	Type of occupation	No. of respondents	Percentage of representation
1	Doctor	1	3.03%
2	Veterinarian	0	0 %
3	Teacher	1	3.03%
4	Engineer	5	15.15%
5	Lawyer	2	6.06%
6	Economist	3	9.09%
7	Laborer	1	3.03%
8	Farmer	0	0%
9	Official	13	39.39%
10	Craftsman	0	0%
11	Housewife	1	3.03%
12	Pupil	0	0%
13	Student	0	0%
14	Retired	6	18.18%
15	Others	0	0%
	Total	33	100%

TABLE 5. Condition of respondents before treatment - Acute lumbar pain syndrome

Score	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5	TOTAL:
No. of respondents	0	1	4	17	5	0	27
Percentage of representation	0%	3.70%	14.81%	62.96%	18.51%	0%	100 %

$\bar{\chi} = 2.96$

TABLE 6. Condition of respondents after treatment - Acute lumbar pain syndrome

Score	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5	TOTAL:
No. of respondents	0	0	0	0	8	19	27
Percentage of representation	0%	0%	0%	0%	29.63%	70.37%	100 %

$\bar{\chi} = 4.71$

TABLE 7. Condition of respondents before treatment - Chronic lumbar pain syndrome

Score	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5	TOTAL:
No. of respondents	0	0	0	9	23	1	33
Percentage of representation	0%	0%	0%	27.27%	69.70%	3.03%	100 %

$\bar{\chi} = 3.76$

TABLE 8. . Condition of respondents after treatment - Chronic lumbar pain syndrome

Score	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5	TOTAL:
No. of respondents	0	0	0	0	12	21	33
Percentage of representation	0%	0%	0%	0%	36.36%	63.64%	100 %

$\bar{\chi} = 4.63$

TABLE 9. Treatment results - Chronic lumbar pain syndrome

Treatment results	Number of respondents Acute lumbar pain syndrome	%	Number of respondents Chronic lumbar pain syndrome	%
0	0	0%	0	0%
2	0	0%	0	0%
3	0	0%	6	18.18%
4	8	29.63%	6	18.18%
5	19	70.37%	21	63.64%
6	0	0%	0	0%
7	0	0%	0	0%
Total	27	100%	33	100%
Mean score	$\bar{\chi} = 4.71$		$\bar{\chi} = 4.27$	

DISCUSSION

By data analysis in the clinic "Praxis" 27 respondents suffering from acute lumbar pain syndrome and 33 respondents suffering from chronic lumbar pain syndrome were treated during the period from 01.01.2010 to 31.12.2012 year.

The age structure of respondents suffering from acute lumbar pain syndrome consisted of 4 male respondents and 1 female respondent age group from 25 to 34 years, 3 male respondents and 8 female respondents age group from 35 to 44 years, 3 male respondents and 2 female respondents age group

from 45 to 54 years and per 2 male respondents and 1 female respondent each age groups from 55 to 64 and over 65 years of age.

For chronic lumbar pain syndrome 1 male respondent and 6 female respondents belonged to the age group from 25 to 34 years, 2 male respondents and 2 female respondents to the group from 35 to 44 years, 3 male respondents and 5 female respondents to the group from 45 to 54 years, 5 male respondents and 2 female respondents to the group from 55 to 64 years and 2 male respondents and 5 female respondents to the age group over 65 years of age.

The largest number of respondents suffering from acute lumbar pain syndrome were officials by profession 10 (37.04%), the second largest number were economists 5 (18:51%) and lawyers 4 (14.81%). A smaller number of respondents were engineers and retired people 2 (7:40%), while the least represented occupations were doctor, housewife, student and others 1 (3.70%) respondent per each. For chronic lumbar pain syndrome 13 (39.39%) of the respondents were officials, followed by retired people 6 (18:18%), engineers 5 (15:15%), economists 3 (9.09%) and lawyers (6.06%), whereas the smallest number of respondents 1 (3.3%) per occupation were doctor, teacher, laborer and housewife.

Moore C. and associates have been investigating the occurrence of lumbar pain syndrome in healthcare workers with sitting jobs during the period of one year. Among the respondents who have been doing exercises daily there was no occurrence of lumbar pain syndrome, whereas 60% of respondents of the control group experienced pain in the lumbar spine (11).

The mean score of condition of respondents with acute lumbar pain syndrome before therapy is 2.96, whereas after treatment is 4.71. The mean score of condition of respondents with chronic lumbar pain syndrome before therapy is 3.76, whereas after treatment is 4.63. Mean score of treatment results of patients suffering from acute lumbar pain syndrome is 4.71, while for chronic lumbar pain syndrome is 4.27. The research conducted by França FR. and associates showed that lumbar spine stabilizing exercises lasting for 6 weeks, twice a week for half an hour, are effective in reducing pain and disabilities caused by lumbar pain syndrome (12). G. Morone and associates conducted the research about improving quality of life of patients with chronic lumbar pain syndrome. They used a multidisciplinary program of exercises for the back. The results showed a significant reduction in pain and disabilities caused by chronic lumbar pain syndrome after three and six months (13).

CONCLUSIONS

From acute lumbar pain syndrome most often suffered female respondents age group from 35 to 44 years old, while in the male respondents was equally represented in all age groups. Chronic lumbar pain syndrome was most often represented in male respondents life age from 55 to 64 years and in female respondents age group from 25 to 34 years old. Respondents who are officials by occupation are most commonly affected by acute and chronic lumbar pain syndrome. Treatment with trunk stabilizing exercises performed in the clinic "Praxis" leads to an improved scores of condition of respondents after treatment. Ratings of treatment results indicate that the treatment with trunk stabilizing exercises in the early stages of lumbar pain syndrome is more successful.

COMPETING INTERESTS

The authors declare no conflict of interest

REFERENCES

1. Pecar Dž. Komparacija efekata primjene «Praxis metode» i klasičnog pristupa u liječenju lumbarnog bolnog sindroma. Doktorska disertacija, Medicinski fakultet Univerziteta u Sarajevu, poseban tisak, 2002.
2. Kapetanović N H, Pecar Dž. Vodič u rehabilitaciju. Univerzitetska knjiga, I.P. „Svjetlost“ d.d. Sarajevo, 2005.
3. Laerum E, Dullerud R, Kirkesola G, Mengshoel M A, Nygaard P Q, Skouen S J, Stig L-C, Werner E. The Norwegian Back Pain Network - The communication unit. Acute low back pain. Interdisciplinary clinical guidelines, Oslo, 2002.
4. Braddom L. Randall. Handbook of Physical Medicine and Rehabilitation. Department of Physical Medicine and Rehabilitation, Indiana University School of Medicine, Indianapolis, Indiana, 2004.
5. Kelić S. Lumbarni sindrom. Autorski rad, PANS - Poslovni adresar, Novi Sad, 2009.
6. Low Back Pain Exercises. University of Michigan Health System, UMHS Clinical Care Guidelines Committee, Michigan, 2007.
7. Davarian S, Maroufi N, Ebrahimi I, Farahmand F, Parnianpour M. Trunk muscles strength and endurance in chronic low back pain patients with and without clinical instability. Faculty of Rehabilitation, Teheran University of Medical Sciences, Teheran, Iran, J Back Musculoskelet Rehabil. 2012 Jan 1; 25 (2): 123 - 9.

8. Bronfort G, Maiers M J, Evans R L, Schulz C A, Bracha Y, Svendsen K H, Grimm R H Jr, Owens E F Jr, Garvey T A, Transfeldt E E. Supervised exercise, spinal manipulation, and home exercise for chronic low back pain: a randomized clinical trial. Wolfe Harris Center for Clinical Studies, Northwestern Health Sciences University, Bloomington, MN 55431, USA, Spine J. 2011 Jul; 11 (7): 585 - 98. Epub 2011 May 31.
9. Del Pozo - Cruz B, Gusi N, Del Pozo - Cruz J, Adsuar J C, Hernandez - Mocholi M, Parraca J A. Clinical effects of a nine - month web - based intervention in subacute non - specific low back pain patients: a randomized controlled trial. Faculty of Sport Science, University of Extremadura, Caceres, Spain, Clin Rehabil. 2012 May 31.
10. Pecar Dž. Ocjena modela baze podataka za fizikalnu rehabilitaciju u zajednici. Magistarski rad, Medicinski fakultet Univerziteta u Sarajevu, poseban tisak, 2000.
11. Moore C, Holland J, Shaib F, Ceridan E, Schonrad C, Marasa M. Prevention of Low Back Pain in Sedentary Healthy Workers: A Pilot Study. From the University of Louisville School of Medicine (CM, FS, EC, CS, MM); Department of Sport Medicine (JH), Frazier Rehab Institute; and James Graham Brown Cancer Center (CM, EC, CS, MM), University of Louisville, Louisville, Kentucky, Am J Med Sci. 2011 Dec 14.
12. França F R, Burke T N, Caffaro R R, Ramos L A, Marques A P. Effects of muscular stretching and segmental stabilization on functional disability and pain in patients with chronic low back pain: a randomized, controlled trial. J Manipulative Physiol Ther. 2012 May; 35 (4): 279 – 85.
13. Morone G, Paolucci T, Alcuri M R, Vulpiani M C, Matano A, Bureca I, Paolucci S, Saraceni V M. Quality of life improved by multidisciplinary back school program in patients with chronic non - specific low back pain: asingle blind randomized controlled trial. Movement and Brain Laboratory, IRCCS Santa Lucia, Rome, Italy, Eur J Phys Rehabil Med. 2011 Dec; 47 (4): 533 - 41. Epub 2011 Apr 20.