

SIGNIFICANCE OF THE EARLY REHABILITATION IN LUMBAR SINDROME

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(Original scientific paper)

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Abstract

Introduction: Disability associated with chronic lumbar pain is one of the most common painful states of the modern human being and represents a benign condition with highest costs in the healthcare system.

Objective: To detect the differences between the results from the treatment of patients with low lumbar pain, depending on the type of the applied methods of treatment: physical therapy or medical treatment.

Materials and methods: This study has enrolled 200 patients with low lumbar pain, treated with medical and physical therapy that, according to the given therapy, were divided into two groups and examined before and after completion of the treatment. Oswestry Index was used for assessment of disability associated with lumbar pain. **Results:** The respondents were with an average age of 53.8 years, most of who were female patients (62 %) and had normal body weight, (BMI=22.6). 34% of the respondents had a job position that mostly involves seating, whilst 48% of them had a job which does not require physical activity. T-test indicated nearly two times bigger drop of the disability index in patients who had received physical therapy (28.8) in comparison with the drop of the disability index in patients who had received medical therapy (15.72), ($p<0.05$). **Conclusion:** The early practice of physical therapy and reduction of the longer period spent for resting bring better and quicker results for reduction of the disability associated with lumbar pain.

Key words: low lumbar pain, disability, deformity, kinesitherapy, ergonomic principles.

Introduction

Lumbar pain is one of the most common painful conditions of modern human being and is one of the most common reasons for lost working days (1). In 70% of all cases of mechanical lumbar pain it owes to the degenerative changes in the discs and facet joints, in 4% due to compressive factors, as a consequence of osteoporosis, in 3% due to spinal stenosis and all other reasons occur in less than 1% of the cases (2,3). The degenerative changes in the lumbar intervertebral disc are accelerated under the influence of the genetic factors and constitutional weakness in the constitution of the disc, biochemical changes in its structure, the excessive biomechanical, static and dynamic pressures, among which are the excessive pressures related to the job, as well as the individual factors (age, nicotine, excessive body weight, weak bearing of the body, reduced level of fitness etc.) (2,4).

Most authors agree that there are very few people, equally men and women, who at least once in their life have not faced problem with spinal column. In fact, there is no difference in the disposition of this ill-health condition according to the sex (5). Nearly 70% of the patients have more serious shapes of disorders of the lower back disc affecting the most productive middle years of adult life i.e. between 30 and 50 years. With aging the difficulties reduce in patients of both sexes and at the age over 70s the reasons for pain in the lower back are of different nature, primarily due to osteoporosis. Yet, this rule has numerous exceptions (3,6). Most patients with lumboishialgia, as a consequence of discus hernia are getting better in less than six weeks and 1% to 20% of them have need of operative treatment. There is high probability for reoccurrence of lumbar pain – 60% to 90% (7,8,9). Nevertheless, in 7% to 10% of the patients who had acute pain in the lower back, it is transferring into chronic pain and often accompanied by changes in the way of living of the patient and his behavior. These patients spend 80% of the finances from the health,

pension, invalid and the social funds as well as the finances from the insurance companies whose work relate to the lower back disorder. The disability caused by the chronic lumbar pain is benign condition with highest costs and losses in the developed industrial countries (5,10,11).

The aim of this study is to show the outcome of the early practice of physical and kinesitherapy methods, the quick and complete eradication of the pain and disability, the prevention of chronic pain, in comparison with the long-term treatment of the patients with medical therapy and the persistent stand of the doctors not to start with physical therapy until the pain is treated with medical therapy.

The main objective of the study is to establish the differences between the results from the treatment of patients with low lumbar pain, depending on the type of the applied methods: physical therapy or medical treatment in acute phase of the lumbar pain.

Material And Methods

The study is observational, descriptive and longitudinal, carried out from 2008 to 2010. It has encompassed 200 respondents, patients with low lumbar pain registered in five (doctor's) surgeries for general medicine and three surgeries for physical therapy in Skopje. The selection of the patients was done randomly, by using method of random sample from different municipalities.

The observational-descriptive part of the study covered collection, processing and assessment of the data of all respondents that participate in the study. Specially prepared survey questionnaire was used for the needs of the study, which was filled in by the examiner. The design and the composition of the questionnaire was based on case-control study anamnestic investigation (epidemiological and demographic characteristics: sex, age, place of residence, profession and social status; functional status: body mass index (BMI), functional status of the spinal column and manual muscular test; type of applied therapy: physical procedures and medication therapy).

The longitudinal examination was carried out in two phases, at the beginning and after completion of the treatment applied to the examined study population, which on the basis of the applied treatment (physical therapy or medication) were divided into two groups: 1. Examined group – (Case), 100 respondents, with low lumbar pain who asked for medical assistance in (doctor's) surgeries for physical therapy and were treated with physical procedures, and 2. Control group – (Control), 100 respondents, with low lumbar pain who asked for medical assistance in surgeries for general medicine, addressing to their general practitioners (GPs) and were treated with medication therapy. The respondents were asked to fill in a survey questionnaire so called, Oswestry Index, a special questionnaire for assessment of disability associated with lumbar pain.

Due to statistical processing and analysis of the obtained data, appropriate statistical methods were used. The statistical significance of the differences was established by use of appropriate statistical tests: Pearson's X^2 test; Student's t-test; Pearson's (r) correlation coefficient and Levene's test for equality of variance. Kolmogorov-Smirnov test (K-S test) of correspondence, from the group of nonparametric statistical tests, was used as well. Moreover, uni-variant logistic regression analysis and multi-variant logistic regression analyses were used, too. The statistical significance was defined for $p < 0.05$. The study was prepared by using statistical programme SPSS, version 14.

Results

In the analysis of distribution of frequency used to the respondents that have undergone physical therapy according to the variable sex, 53 (53%) out of 100 patients are female and 47 (47%) are male patients. Out of the total 100 respondents that received medical therapy, 71 (71%) are female and 29 (29%) are male. Out of the total 200 respondents from both examined groups, most of them are female patients (62 %), (table 1).

The respondents treated with physical therapy were with average age of 51.84 years. The lower limit is 49.13 years, whilst the upper limit is 54.55 years. The standard deviation is 13.635, with a standard error of 1.364. The youngest patient is 18 years, while the oldest is 80 years old (table 1). The average age of the respondents that underwent medication therapy is 55.86 years. The standard deviation is 13.946, with a standard error of 1.395. The youngest respondent is 21 years, while the oldest is 91 years old (tab.1). The examined groups are with average age of 53.8 years; t-test showed that there is statistical significance of the differences between the average age of the respondents ($p < 0.05$), (tab.1). According to the analysis of distribution of frequencies used to the respondents that had undergone physical therapy, calling upon the profession as a variable, it was established that highest percentage of the patients had a job which involves

sitting 39% (administration officials and intellectuals 19%), followed by workers 14%, housewives 14% and craftsmen 9%. Most of the respondents treated with medication therapy, according to the variable profession, are pensioners – 33%, 29% have a job which involves sitting (17% are intellectuals and 12% are administration officials), while 15% are workers. It was established that according to the profession, most of the patients had a job which involves sitting 34% (office workers). Kolmogorov-Smirnov test of correspondence shows that the differences are statistically significant ($p < 0.05$).

Table 1. Distribution according to sex, age and BMI

Sex	I group			II group	
female	53(53%)			71(71%)	
male	47(47%)			29(29%)	
Age	average	minimum	maximum	± St.Dev.	
I group	51,8 years	18 years	80 years	13,6 years	
II group	55,9 years	21 years	90 years	13,9 years	
Body mass index (BMI)	average			± St.Dev.	
I group	22,8			3,9	
II group	22,4			3,1	

The analysis of the variable BMI in patients treated with physical therapy or medical therapy gives data that the average index of body mass in patients treated with physical therapy is 22.8, with standard deviation 3.938 and standard error 0.394. The average BMI in patients treated with medication therapy is 22.4, with standard deviation 3.060 and standard error 0.306.

From what has been said above it can be concluded that the average BMI in both groups show that in average the patients are with normal body mass (tab.1). The examination of statistical significance of the differences between the indexes of body mass in patients treated with physical therapy or medication therapy was carried out with Levene's Test for Equality of Variances. Test statistic (F) has value = 5.532 and p-value (significance level) = 0.020, which implies they differ statistically significant. However, the t-test=0.786 with df=0.786 and p=0.433, indicates of absence of statistical significance of the differences.

In the analysis of the index of disability in patients with lumbar pain before and after application of physical therapy, it was established that the average index of disability in patients before application of the physical therapy is set at 43.4 with standard deviation of 23.984 and standard error 2.398, while the average index of disability after application of physical therapy amounts 14.6 with standard deviation 13.974 and standard error 1.397 (tab.2). T-test=15.997 shows there is statistically significant difference of 28.8 in the average values of the index of disability in patients before and after application of physical therapy at degree of freedom (df=99) and error ratio ($p < 0.05$).

Table 2. Index of disability in patients with lumbar pain before and after application of physical and medical therapy, Karl-Pearson's correlation coefficient

Disability index in patients		average	N	Std. deviation	Std. error	correlation	Sig.	average	Std. deviation	t	df	Sig
Par 1	Disability index before physical therapy	43,40	100	23,984	2,398	0,666	0,00	28,800	18,003	15,997	99	0,00
	Disability index after physical therapy	14,60	100	13,974	1,397							
Par 2	Disability index before medical therapy	34,34	100	17,061	1,706	0,854	0,00	15,720	8,976	17,514	99	0,00
	Disability index after medical therapy	18,62	100	15,926	1,593							

Karl-Pearson's correlation coefficient in the variables index of disability before and after application of the physical therapy in the group of respondents ranges within the limits of -1 to +1, amounting $r=0.666$ at ($p<0.05$), which means there is relatively strong positive incomplete correlation (tab.2).

The analysis of the disability index in patients with lumbar pain before and after application of the medical therapy shows that the average index of disability in patients before the application of medical therapy is 34.34 with standard deviation of 17.061 and standard error of 1.706, whilst the average index of disability after application of the medical therapy is set at 18.62, with standard deviation of 15.926 and standard error of 1.593. The t -test=17.514 shows statistical significance of the differences between the average values of the indices of disability before and after application of the medication therapy of 15.72 in the respondents, at degree of freedom ($df=99$) and error ratio ($p<0.05$).

Karl-Pearson's correlation coefficient in the variables index of disability before medical therapy/index of disability after medication therapy in the group of respondents ranges from -1 to +1 and amounts: $r=0.854$ at ($p<0.05$), which implies that there is very strong positive incomplete correlation (tab.2).

The difference between the average values of the index of disability before and after the application of physical therapy amounts 28.8, whilst the difference between the average values of the index of disability before and after the given medication therapy amounts 15.72. The drop of the index of disability in patients who underwent physical therapy is twice higher compared to drop of the index of disability in patients who received medication therapy (tab.2).

The results from the uni-variant analysis of the factors deformities in respondents and age in respondents represent predicative values which independently, statistically significantly, are associated with the type of the therapy (physical/medication), at significance level $p<0.05$ (tab.3). It can be concluded that the outcome does not depend on the patient's sex, whereas there is insignificant negative correlation between the age and the BMI.

Table 3. Coefficients in multi-variant logistic regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	,574	,190		3,020	,003	,199	,948			
	deformities YES/NO	,353	,076	,317	4,631	,000	,203	,503	,267	,314	,310
	type of profession of the respondents	,043	,027	,108	1,567	,119	-,011	,096	,118	,111	,105
	age of the respondents	,007	,003	,184	2,619	,010	,002	,012	,145	,184	,175

Discussion

Although in both examined groups, most of the patients are female, as well as according to the data of Institute for Public Health of R. Macedonia and the analysis of distribution of frequencies of registered dorsopatie at the level of Primary Health Care (PHC) and patients who underwent hospital treatment in the period from 1998 to 2006, it can be concluded that most of the patients are female, though in the professional literature it is stressed that in patients with lumbar syndrome there is no evidence of susceptibility due to the patient's sex. The studies where subject to analysis is the lumbar syndrome encompass different indicators in terms of the sex, but yet it can be concluded that in fact there is no evidence of disposition for the health disorder in terms of the sex (2,3,5).

The patients with lumbar syndrome are usually at age when they are professionally most productive. The average age of occurrence of the first attack of lumbar pain is 37 years (5). In the different studies of the outcome of the conservative treatment of the patients with lumbar syndrome, the average age of patients was from 35 to 40.6 years (3,6).

Many authors stress that different professional factors take part in development of the degenerative changes of the lumbar spine: repetitive microtrauma, cumulative effect of flexor and compressive injures of spine (9), job that involves frequent bending and rotation of the spine (10), prolonged sitting and standing

at work or home (11), exposure to vibrations, especially driving a car or freight vehicle for very long time or quite often (12). Pope M.H. in vivo experiments showed that driving of motor vehicles can be a reason for occurrence of hernia of nucleus pulposus. The electromyography studies show presence of notable weakness of m. erector spinae after exposure to vibrations (13). Concerning the examination of Ahn, in terms of the profession of 36 patients with lumbar discus hernia, 12 patients had professions that involved sitting for long time, 7 patients were doing hard physical work and 13 of 17 female patients were housewives (14).

According to the analyses of the BMI of patients with lumbar syndrome, most authors establish that the greater part of the patients were with excessive body weight. Böstman O.M. in his study of preoperative BMI and standard body height of 1,128 patients, compared to the control group of general population, has concluded that the increased BMI of taller patients led to serious discus hernia which requires operative intervention (11).

Kircher J.T. emphasizes that resting in bed and attentively waiting for the pain to reduce and disappear during a period of couple of weeks in patients with lumbar syndrome, besides the medication therapy, is not an efficient method. The same was proved by Vroomen P.C. (14). Buttermann G.R. in the examination carried out on 38 patients with lumbar discus hernia, with conservative (non-invasive) treatment (physical therapy, medicines, modification of activity, chiropractic) and on 20 patients who received epidural injections proved that the group of patients that was conservatively successfully treated had greater number of resorbed extruded and sequestered discus hernias when doing the control MR imaging (15). According to Swensson H.O. the most significant factors in forecasting of the disability due to strong chronic pain depend less than the clinical finding, and more on the length of the latest disability episode, history of the latest disability episode, the psychosocial factors, the requirements of the profession as well as job satisfaction (16). Moffett J.K. in his study encompassing 187 patients with lumbar pain, during a period of 4 weeks to 6 months, has applied treatment with a programme of exercises which involved exercises for strengthening of all main muscular groups, exercises for stretching, relaxation, short education about taking care of the spine. Following 6 to 12 month treatment, the results have shown that the exercises were clinically more efficient in comparison with the treatment by general practitioner (GP) and were cost effective as well (17).

Chronic lumbar pain, seen from a medical and psychosocial aspect is a complex issue, for which a comprehensive and multidisciplinary approach during the evaluation and treatment is needed. The aims of the treatment in one programme of interdisciplinary centre are reduction of the pain, improvement of the function and reduction of the use of healthcare services. These aims involve reduced usage of medicines, change of the response of the pain, increased activity and reduction of 'painful behaviour' (18).

Conclusion

From what has been stated above we can conclude that early practice of physical therapy is needed and reduction of the time spent in bed for resting as well as the treatment only with medication therapy, since thus better and quicker results for reduction of disability, reduction of the lumbar and radicular pain as well as improvement of the function of the lumbar part of the spine and the organism as a whole, prevention of the chronic pain, which leads to returning to work faster and carrying out daily activities without difficulties.

Since resting in bed causes muscular weakness, deconditioning of the cardiovascular system, osteoporosis, recommending inactivity for a period longer than one week should be avoided. The longer the pain lasts the more resistant to therapeutic interventions it becomes. In case of chronic pain, it might be necessary to use several strategies for modulating the pain and increase the level of activity. This form of treatment often is part of the rehabilitation programmes where the patient learns how to treat his pain, reduce the usage of medicines and 'painful behaviour', whereby satisfactory functional, social and professional outcome can be reached as well as provision of long-term benefit.

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