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The Effect of Selected Factors on the Intensity of Low-back Pain within Six Months from the Complaint Onset

Wpływ wybranych czynników na intensywność bólu lędźwiowego odcinka kręgosłupa w ciągu sześciu miesięcy od wystąpienia dolegliwości

Małgorzata Kołpa¹, Agnieszka Jankowicz-Szymańska¹, Edyta Mikołajczyk²

¹State Higher Vocational School in Tarnow, Institute of Health Sciences, Poland

²University of Physical Education in Cracow, Department of Physiotherapy, Poland

Abstract

Introduction. Low-back pain (LBP), resulting from a slipped disc, exerts a long-lasting and irritating impact on all aspects of human life.

Aim. The study aimed at assessing the effect of selected factors on the severity of pain measured on the Visual Analogue Scale (VAS) in patients who were treated conservatively due to a slipped disc in the lumbar section of the spine.

Material and Methods. A total of 400 patients of the Outpatient Neurosurgical Clinic at the St. Lukas Regional Hospital in Tarnow, Poland, were involved in the survey. The observations (weight status and pain intensity) were conducted twice: when the problems appeared and after 6 months.

Results. Obese and overweight individuals (79.5%) and the ones with android adiposity (86%) were most numerously represented in the research groups. The most severe low-back and leg pain in surveys one and two was reported by obese patients and the ones who belonged to the group of senior participants.

Conclusions. Conservative treatment combined with pro-health instructions brought the greatest subjective pain relief. The worst effects were achieved by obese patients. (JNNS 2015;4(1):24–29)

Key Words: LBP, obesity, back pain

Streszczenie

Wstęp. Ból lędźwiowego odcinka kręgosłupa spowodowany dyskopatią wywiera długotrwały negatywny wpływ na wszystkie aspekty życia.

Cel. Ocena wpływu wybranych czynników na nasilenie bólu mierzonego na wizualnej skali analogowej (VAS) u pacjentów, którzy byli leczeni zachowawczo z powodu dyskopatii w odcinku lędźwiowym kręgosłupa.

Materiał i metody. Badaniom poddano łącznie 400 pacjentów Poradni Neurochirurgicznej Szpitala Świętego Łukasza w Tarnowie, w Polsce. Obserwacja (ocena stanu odżywienia i intensywności bólu) była prowadzona dwukrotnie: w momencie pojawienia się dolegliwości i po sześciu miesiącach.

Wyniki. Osoby z nadwagą lub otyłością (79,5%) i z androgenicznym typem budowy ciała (86%) były najliczniej reprezentowane w grupach badanych. Największe nasilenie bólu w kręgosłupie i kończynach dolnych zarówno w pierwszym, jak i drugim badaniu zanotowano u osób z otyłością i osób z najstarszej grupy wiekowej.

Wnioski. Największą subiektywną ulgę w bólu przyniosło połączenie leczenia zachowawczego z edukacją prozdrowotną. Najgorsze efekty uzyskano u pacjentów otyłych. (PNN 2015;4(1):24–29)

Słowa kluczowe: ból odcinka lędźwiowego, otyłość, bóle kręgosłupa

Introduction

The musculoskeletal complaints, and in particular spinal pain, belong to crucial medical problems in the

21st century. In Poland, they concern 80% of the society aged 30–40 years, whereas in senior individuals they occur even more frequently. Reports from many places and environments indicate that in some industrialised

countries lumbar and lumbosacral pain has become a dramatically developing epidemic, which adversely affects social and economic lives of their citizens [1–5].

LBP caused by a slipped disk exerts a long-lasting, and very irritating and negative influence on practically all aspects of human life. Due to the above condition, patients experience psychomotor disturbances, the quality and control of their body posture becomes worse and their physical, mental and social functioning deteriorates. Spinal pain is the most frequent cause of temporary or permanent loss of work ability and brings socio-economic disadvantages both for the patient as well as for the state. Expenditures related to medical care of patients who suffer from spinal pain reach 37 billion dollars annually in the United States [6,7]. Absence from work or decline in productivity cost American economy another 19 billion dollars [8], and in Great Britain spinal suffering results in 15% of sick leaves for which the British government pays annually over £10.5 million [9–11]. The above statistics make economists, industrialists, politicians — and especially physicians and their allied professionals — deal with spinal problems and look for novel therapeutic means and preventive programmes.

A decreased physical activity, many a time connected with excessive weight, is counted among leading etiological causes of discopathy. The authors of the study are convinced that overweight adversely affects the spine and the course of the spine-related diseases, and considerably aggravates back pain. According to Kiwerski, each kilogram of weight gain evidently exerts a ne-

gative impact on the functioning of the lumbar spine and adds to the development of overload-induced changes in the structure of the spine [12].

The survey aimed at assessing the effect of selected factors on the presence of the severity of pain measured on the VAS in patients who were conservatively treated due to LBP. A special attention was paid to dependencies between changes in pain intensity radiating to the spine and lower extremities, and the patients' nutritional status.

Material and Methods

A total of 400 individuals — including 195 males (48.75%) and 205 females (51.25%) — patients of the Outpatient Neurosurgical Clinic at the St. Lucas Regional Hospital in Tarnow, Poland — were involved in the survey, conducted from January 2010 to March 2011. They were included in the study on the basis of a diagnosed lumbar discopathy at L4-L5 or L5-S1, confirmed by RMI, physician's referral for conservative treatment and a submission of their informed consent in writing to take part in the study. Prior to the survey, we obtained a permit of the local Bioethics Committee (Resolution No 6/0177/2010 of 19 October 2009).

Each participant's age and sex were recorded, their body height was measured within 0.01 m, by means of a calibrated anthropometer and their body was weighed within 0.1 kg on Tanita scales. Then BMI value was cal-

Table 1. The severity of low-back and right and left lower extremity pain at the onset of complaints and after a lapse of 6 months (scale from 0 to 30)

Variable	Group N (%)	Time of measurements		P
		Mean+SD		
		First visit	After six months	
Gender	Females n=205 (51.25%)	13.57+3.62	7.27+3.36	<0.00001
	Males n=195 (48.75%)	12.76+3.69	6.58+3.08	<0.00001
Age	<30 n=42 (10.5%)	12.69+0.57	4.19±0.49	<0.00001
	31–50 n=199 (49.75%)	12.88+0.27	6.25±0.20	<0.00001
	>50 n=159 (39.75%)	13.65+0.27	8.50±0.29	<0.00001
Nutritional state	Normal weight n=82 (20.5%)	13.00+3.73	5.45+2.78	<0.00001
	Overweight n=187 (46.75%)	13.08+3.71	6.75+2.87	<0.00001
	Obesity n=131 (32.75%)	13.41+3.60	9.87+8.98	<0.00001
Change in body weight	Weight gain n=21 (5.25%)	13.02 +3.58	6.24+2.64	<0.00001
	Unchanged n=140 (35%)	12.34+3.32	6.74+2.68	<0.00001
	2–5 kg weight loss n=118 (29.5%)	12.48+3.23	6.78+2.91	<0.00001
WHR	>5 kg weight loss n=121 (30.25%)	12.59+3.22	7.31+2.79	<0.00001
	Gynoid type of fat n=56 (14%)	11.96+3.33	5.63+2.79	<0.0001
	Android type of fat n=344 (86%)	10.56+3.20	6.64+2.66	<0.0001

Table 2. The severity of low-back pain at the onset of complaints and after a lapse of 6 months (scale from 0 to 10)

Variable	Group N (%)	Time of measurements		P
		Mean+SD		
		First visit	After six months	
Gender	Females n=205 (51.25%)	6.68+2.45	3.27+1.42	<0.0001
	Males n=195 (48.75%)	6.79+2.53	3.39+1.53	<0.0001
Age	<30 n=42 (10.5%)	6.63+2.30	2.27+1.72	<0.0001
	31–50 n=199 (49.75%)	6.84+2.34	3.35+1.58	<0.0001
	>50 n=159 (39.75%)	7.03+2.27	4.33+1.72	<0.0001
Nutritional state	Normal weight n=82 (20.5%)	6.79+2.32	3.33+1.66	<0.0001
	Overweight n=187 (46.75%)	6.90+2.36	3.06+1.52	<0.0001
	Obesity n=131 (32.75%)	6.95+2.24	3.08+1.56	<0.0001
Change in body weight	Weight gain n=21 (5.25%)	6.48+2.58	4.24+1.64	0.0007
	Unchanged n=140 (35%)	6.85+2.32	3.74+1.68	0.0003
	2–5 kg weight loss n=118 (29.5%)	7.04+2.23	3.78+1.91	0.0003
WHR	>5 kg weight loss n=121 (30.25%)	6.99+2.22	3.31+1.79	0.0003
	Gynoid type of fat n=56 (14%)	6.96+2.33	3.63+1.79	<0.0001
	Android type of fat n=344 (86%)	6.88+2.20	3.64+1.66	<0.0001

culated and on its basis the participants were qualified for one of the following three groups: with normal weight (BMI<25), overweight (BMI between 25 and 29.99) and obese (BMI 30 or >). After the measurements of the waist and hip circumferences, the WHR ratio was calculated and the participants were ascribed android or gynoid types of obesity. Abdominal obesity was diagnosed when WHR exceeded: in the case of men — 0.95, in women — 0.85 [13]. The intensity of pain — separately for the spinal part, right lower and left lower extremity — was determined by means of the VAS. It was assumed that “0” indicated complete lack of pain sensation, whereas “10” the maximum one [14–16]. The results of all scores were summed up in further analysis and the variable was described as the VAS sum. The severity of the spinal pain sensation declared by the patients at a given moment was also recorded.

The survey was conducted twice in the same patients; at their first visit to the clinic, i.e. before commencing conservative treatment (measurement 1), and after a lapse of 6 months (measurement 2). After the first measurement, the patients were given information and suggestions about health-promoting behaviour, which mainly aimed at keeping normal weight or reduce body weight. Between the measurements, they underwent individually planned pharmacological (non-steroidal anti-inflammatory drugs, reducing muscle tension and pain) and PT treatments (exercises by means of McKenzie method, physical treatments, massage), which lasted up to three months from the date of the first visit to the clinic.

The statistical analysis of the results was made by means of Statistica v. 10 software and basic descriptive statistics, as well as the Shapiro-Wilk test, the t test for dependent samples and the Wilcoxon test. Differences between variables under research were significant if $p < 0.05$.

Results

Out of a total of 400 patients admitted to the Out-patient Clinic due to low-back pain and reduced physical fitness, the individuals with excessive weight or obesity (79.5%) and those with android adiposity (86%) were represented most numerously. Half of the patients were aged between 31 and 50, almost 40% were over 50, and approximately 10% were younger than 30 years. Gender did not markedly differentiate the groups under research, which consisted almost of the same number of males as females. A total of 59.75% of all participants reduced their body weight as a result of pro-health attitudes.

Changes in the severity of low-back and lower extremity pain

All participants were asked to determine their low-back and right and left leg sensations of hurting on a scale from 0 to 10. Their scores were summed up and the value was marked as the VAS sum (Table 1).

It was noticed that at the start of complaints, stronger discomfort was perceived by the individuals older than 50, obese and with a gynoid type of adiposity, as well as by females. After a lapse of 6 months, sensations of hurting considerably eased in all groups. The subjectively assessed pain intensity clearly decreased in young patients (8.5 pts change) and in individuals with normal weight (7.55 pts change). The smallest pain relief was observed in obese persons (3.54 pts change), the ones with android adiposity (3.92 pts change) and in the patients older than 50 (5.15 change). Differences in pain relief between males and females were slight. It was disclosed that the patients who gained weight within 6 months from the onset of pain complaints experienced greater pain relief in comparison to those whose weight did not change or who lost weight. The greatest low-back and leg discomfort in measurements one and two was reported by obese patients and those included in the group of senior participants.

Changes in low-back pain severity

At the start of complaints, the most acute low-back pain was reported by senior patients, the individuals with weight gain and those with gynoid adiposity (Table 2). The greatest pain relief was discovered in the individuals younger than 30 (4.36 pts change), obese and with weight gain (3.87 pts and 3.84 pts changes), and in those who lost more than 5 kg (3.68 pts change), whereas the smallest relief was noticed in the participants older than 50 (2.7 pts change). As opposed to the severity of pain assessed jointly within low-back and lower extremity, the relief of spinal pain itself was the smallest in the patients who gained weight and it was the greatest in those who reduced their weight by more than 5 kg.

Discussion

The assessment of therapeutic effects in patients experiencing chronic spinal pain focuses on finding objective clinical changes which would prove the effectiveness of therapy. Suffering is a prevailing manifestation of the complaint and that is why pain-related conditions are treated as fundamental variables used for assessment of therapeutic results. All attempts to measure pain as a subjective phenomenon are important, however, they are determined solely on the basis of patients' sensations and because of that its assessment is rather dubious. In our survey, the assessment of pain severity was measured by means of the analogue and visual VAS, whose usefulness was confirmed in the studies carried out by many other authors [14–16].

Differences in intensity of physical suffering declared by the participant body in examinations one and two were of statistical significance ($p < 0.00001$). Similar analyses were conducted in males and females, where it was found out that pain relief measured on the VAS in both genders turned out to be of statistical significance ($p < 0.00001$). Taking into account the patients' nutritional status, it was revealed that the smallest detectable pain was typical for the patients with normal body weight, slightly greater in those with weight gain and the most severe in the obese ones.

Jabłońska et al. surveys disclosed that in the group of 46 patients who underwent a surgical treatment due to a slipped disk, the average of pain sensations distinctly decreased from 6.46 points before the treatment to 3.43 points after the treatment. However, it had no crucial impact on the functional state of patients [17]. The survey conducted in Finland — where the effectiveness of the DBC (Documentation Based Care) therapy by means of the Active Spine Therapy was assessed in 125, mostly professionally active patients aged 43, who suffered from recurring lumbar pain — disclosed significant pain relief and improved physical fitness at the end of the therapeutic programme ($p < 0.0001$) [18]. Our research revealed that the group of the youngest patients felt the weakest pain. After the therapy, the levels of the average pain severity measured on the VAS in the groups of patients who differed with age turned out to be of statistical significance ($p < 0.0003$).

Age was a factor which differentiated the severity of pain felt by individuals with a slipped disk in the lumbar section of the spine. It was discovered that within 6 months from the onset of complaints, the group of the youngest participants (individuals younger than 30) experienced the weakest spinal pain (2.27 ± 1.72 pts). The same group declared the least severe discomfort assessed in the spine and lower extremities jointly (4.19 ± 0.49). The above results correlated with the ones found in specialist literature. Almost identical observations were reported by Radziszewski [19], who surveyed 665 patients with L4-L5 and L5-S1 discopathy, divided into similar age groups. His study disclosed that the level of pain sensations was considerably determined by the participants' age (the smallest pain was observed in the group of the youngest participants).

Changes in the patients' negative attitude towards pain complaints were important factors which influenced the effectiveness of spinal pain therapies [20–23]. According to Rainville et al., it might be achieved independently of relieving pain symptoms [24]. Clinical experience confirmed instances of individuals with severe pain pathologies who coped well with their problems and lead active life, while others with slight pain complaints did not. Blumenthal et al., connected relieved subjective pain with smaller fear and depression [25].

It should also be mentioned that individual changeability in the patient's psychosomatic reaction to subjective assessment was of considerable importance. Many researchers gave accounts of pain relief in individuals with spinal pain after conservative treatment [26,27]. The above theory was confirmed by the results of our research, where the type of treatment (conservative) significantly affected the level of pain sensations. The character of fatty tissue distribution was not found to influence the severity of spinal pain measured on the VAS.

After 6 months, low-back and leg pain most significantly decreased in the participants with normal weight, whereas the obese ones experienced the smallest pain relief. Differences in pain severity between those two groups increased from 0.41 to 4.42 points. However, a complex assessment of patients with lumbar discopathy should include a number of subjective factors connected with their personal, family and social lives, as well as conditions and relations in their workplaces. Subjective factors are as important for the prognosis of the patients' return to work as the objective assessment of their state of health. It is worth paying attention to the fact that a greater pain relief was felt by the patients who gained weight between the measurements in comparison with those who lost some weight. Changes in the severity of spinal pain itself looked differently. In that case the greatest pain relief was experienced by the patients who lost weight by more than 5 kilograms and the smallest one in those who gained weight. It was difficult to find a cause of those superficially inconsistent results. Medical staff took care of the patients' diagnostics, pharmacological and rehabilitation treatment, pro-health information and suggestions, and most of all of providing them with nutritional advice. They were encouraged to increase their everyday physical activity, but their undertakings were not thoroughly supervised by a specialist. In the light of the research conducted, it seems justified to supplement standard therapeutic procedures with a systematic aerobic workout conducted under the supervision of a qualified physiotherapist or a personal trainer.

Conclusions

1. The gender of patients and distribution of fatty tissue determined by the WHR factor did not significantly affect the level of experienced discomfort in those individuals who complained of low-back pain.
2. The patients older than 50 felt greater pain in the course of discopathy in comparison with younger participants.

3. Body weight differentiated the frequency of low-back pain incidence; weight gain and obesity affected the severity of pain felt by patients.
4. Conservative treatment combined with pro-health advice and suggestions resulted in pain relief. The best results were achieved by the youngest participants with normal weight and the smallest pain relief was observed in obese patients.
5. Traditional conservative treatment of low-back pain should be conventionally supplemented with nutritional advice and systematic aerobic workout.

Implications for Nursing Practice

The nurse should assess weight status of patients with LBP and interview them about healthy eating. In the case of patients with excessive body weight who lead sedentary lives, nurse should undertake appropriate education: encouraging to reducing body weight, changes in diet and being regularly physically active.

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Corresponding Author:

Agnieszka Jankowicz-Szymańska
Instytut Ochrony Zdrowia,
Państwowa Wyższa Szkoła Zawodowa
ul. A. Mickiewicza 8, 33-100 Tarnów, Poland
e-mail: jankowiczszymanska@gmail.com

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Author Contributions: Małgorzata Kołpa^{A, B, C, E, F, H}, Agnieszka Jankowicz-Szymańska^{D, E, F, G}, Edyta Mikołajczyk^{F, G}

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