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The Impact of Selected Demographic and Clinical Factors on the Social and Economic Situation of Patients after Surgical Treatment of Lumbosacral Discopathy

Wpływ wybranych czynników demograficznych i klinicznych na sytuację społeczną i ekonomiczną chorych po leczeniu operacyjnym dyskopatii odcinka lędźwiowo-krzyżowego

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Abstract

Introduction. Discopathic lesions of the lumbosacral spine are the most frequently recorded diseases of the osteoarticular and peripheral nervous system.
Aim. The main aim of the study was to evaluate the influence of selected demographic and clinical factors on the social and economic situation of patients after surgical treatment of the lumbosacral discopathy.
Material and Methods. The research was carried out at the Department of Neurosurgery, University Hospital in Bydgoszcz on a group of 137 patients diagnosed with lumbosacral discopathy. The study consisted of double assessment of the patient's condition, taking into account the social and economic situation of the respondents. The Prolo Scale was used for this purpose.
Results. It was found that both the social and economic situation of the respondents after the surgery was definitely better than before the surgery ($p<0.001$). Final results were independent of gender, age and location of the lesion ($p>0.05$). A statistically significant dependence of the final results on the type of work performed, the intensity of pain and the patient's body weight was demonstrated ($p<0.05$).
Conclusions. The social and economic situation of patients with diagnosed lumbosacral discopathy improves significantly after surgery. There was a relationship between the type of work performed and the social and economic situation of the respondents. Among the clinical factors, the degree of pain intensity and the patient's body weight significantly influenced the social and economic situation of the respondents. **(JNNN 2020;9(3):97–102)**
Key Words: clinical factors, demographic factors, lumbosacral discopathy, socioeconomic situation

Streszczenie

Wstęp. Zmiany dyskopatyczne kręgosłupa lędźwiowo-krzyżowego należą do najczęściej rejestrowanych schorzeń układu kostno-stawowego i obwodowego układu nerwowego.
Cel. Głównym celem badań była ocena wpływu wybranych czynników demograficznych i klinicznych na sytuację społeczną i ekonomiczną chorych po leczeniu operacyjnym dyskopatii odcinka lędźwiowo-krzyżowego.
Materiał i metody. Badania przeprowadzono na Oddziale Neurochirurgii, Szpitala Uniwersyteckiego w Bydgoszczy na grupie 137 pacjentów z rozpoznaną dyskopatią odcinka lędźwiowo-krzyżowego. Badanie polegało na dwukrotnej ocenie stanu chorego z uwzględnieniem sytuacji społecznej i ekonomicznej badanych. Użyto w tym celu Skali Prolo.
Wyniki. Stwierdzono, że zarówno sytuacja społeczna jak i ekonomiczna badanych, po zabiegu jest zdecydowanie lepsza niż przed zabiegiem ($p<0,001$). Wyniki końcowe nie zależały od płci, wieku i lokalizacji zmiany ($p>0,05$). Wykazano znamienną statystycznie zależność wyników końcowych od rodzaju wykonywanej pracy, stopnia natężenia dolegliwości bólowych oraz masy ciała pacjenta ($p<0,05$).

Wnioski. Sytuacja społeczna i ekonomiczna chorych z rozpoznaną dyskopatią odcinka lędźwiowo-krzyżowego, uległa istotnej poprawie po leczeniu operacyjnym. Zaobserwowano zależność pomiędzy rodzajem wykonywanej pracy a sytuacją społeczną i ekonomiczną badanych. Wśród czynników klinicznych, stopień natężenia dolegliwości bólowych oraz masa ciała pacjenta istotnie wpływała na sytuację społeczną i ekonomiczną badanych. **(PNN 2020;9(3):97–102)**

Słowa kluczowe: czynniki kliniczne, czynniki demograficzne, dyskopatia odcinka lędźwiowo-krzyżowego, sytuacja społeczno-ekonomiczna

Introduction

Discopathic changes, and in particular discopathic changes in the lumbosacral segment, are among the most common diseases of the peripheral nervous system and the osteoarticular system. Discopathy is a disease process consisting in the gradual highlighting of the nucleus pulpous beyond the contour of the intervertebral disc, which results in compression of the nerve roots, spinal cord or other surrounding structures [1]. In static and dynamic conditions, an upright posture is maintained while walking. As a consequence, it causes overload of the lumbosacral spine and causes pathological changes in the nucleus pulposus and its surroundings [2].

The most common human ailments right after headaches are pains in the lower spine. Pain in the lumbosacral spine is now a common problem among human populations around the world, especially in economically well-developed countries. According to the research conducted, back pain affects nearly 60–90% of society, which is a serious civilization problem. Moreover, these ailments limit physical fitness among 8–11% of patients. They are the second most frequent cause of physical disability and absenteeism of people under 45 [3,4]. These pains appear regardless of age in both sexes. They are characterized by diverse localization and clinical expression. Moreover, with time, various types of motor dysfunctions increase, which, if ignore and untreated, inevitably lead to permanent motor and neurogenic disability [3]. Pain syndromes of the lumbosacral part of the spine are one of the frequent reasons for visits to the GP [5]. Over 90% of patients suffer from acute pain, and another 70% suffer from chronic pain (lasting longer than 12 weeks). Most of the patients do not have any changes apart from degenerative changes visible in the radiographic image, which are responsible for the pain [6]. A patient with chronic pain becomes incapacitated and depends on the health care system [5].

The aim of comprehensive physiotherapy is to eliminate or reduce pain, improve body posture and relieve the spine, strengthen the muscles of the torso and regain the correct range of movements. In case of ineffective conservative treatment, surgical treatment is introduced. Recurrences of testicular hernias after surgical treatment are very common and may result from the combination of many factors and individual characteristics of a given patient [7–9].

The main aim of the study was to assess the influence of selected demographic factors (sex, age, type of work) and clinical factors (localization of the lesion, pain intensity, patient weight) on the social and economic situation of patients after surgical treatment of the lumbosacral discopathy.

Material and Methods

The research was carried out at the Department of Neurosurgery, University Hospital in Bydgoszcz on a group of 137 patients diagnosed with lumbosacral discopathy. The characteristics of the study group are presented in Table 1.

The examination consisted of a double assessment of the patient's condition. The first assessment took place before the surgery, the second one within 6 months of the surgery. The intensity of pain (VAS scale), body weight (BMI) and social and economic situation (Prolo scale).

The Prolo Scale (PS) was used to assess the social and economic situation [10]. It was assumed that the sum of the economic and social status corresponding to 10–8

Table 1. Characteristics of the study group (N=137)

Variable	N	%
1	2	3
Gender		
Women	58	42.3
Men	79	57.7
Age		
Up to 29 years	7	5.1
30–39 years	46	33.6
40–49 years	51	37.2
50–59 years	27	19.7
60–69 years	6	4.4
Type of work		
Mental	46	33.6
Physical	91	66.4

Table 1. Continued

1	2	3
Lesion location		
L4-L5	54	39.4
L5-S1	83	60.6
VAS		
I [weak pain]	9	6.6
II [moderate pain]	96	70.1
III [severe pain]	32	23.3
BMI		
I [correct]	41	29.9
II [overweight]	74	54.1
III [obesity]	22	16.0

points (I group) is a very good result, 7–6 points (II group) is a good result and 5–2 points (III group) is an unsatisfactory result. The pain intensity was assessed using the visual analogue pain scale (VAS) [11]. It was assumed that group I [0–3 points] is weak pain, group II [4–6 points] is moderate pain and group III [7–10 points] is severe pain. Body mass index — BMI was used to calculate body weight [12,13]. According to the adopted WHO criteria, the BMI value to 18.5–24.9 is the correct value (group I), the 25–29.9 range is overweight and 30 and above is obesity.

Ethical Considerations

The research was approved by the Bioethics Committee of the Nicolaus Copernicus University in Toruń at the Collegium Medicum of Ludwik Rydygier in Bydgoszcz.

Data Analysis

Statistical analysis was performed with the use of Microsoft Excel and STATISTICA version 10.0. (CM UMK licence). Statistical hypotheses were verified at the significance level of $p<0.05$

Results

Table 2 shows the overall economic and social situation as assessed before surgery (rating 1) and 6 months after the surgery (rating 2). It can be noticed that, both in the social and economic situation, the assessment made after the surgery is definitely better than before the surgery. The differences in the mean values obtained are statistically significant at the level of $p<0.001$, which means that the social and economic situation of patients with diagnosed lumbosacral discopathy improves significantly after surgery.

Table 2. Assessment of the economic and social situation in rating 1 and 2 (N=137)

Prolo Scale (PS)	Rating 1	Rating 2	P value
Prolo economic score	2.46±1.21	3.78±1.24	<0.001
Prolo functional score	2.03±0.94	3.56±1.16	<0.001

Taking into account the social and economic situation depending on gender (Table 3), it can be noted that men slightly more often (77.3%) were classified as very good (group I) compared to women (69.0%). The situation was similar in the group of people with negative results (group III) — men — 6.3% vs. women — 3.4%. However, the obtained differences were not statistically significant.

Table 3. PS and gender

Gender	PS			Total
	I [10–8 points]	II [7–6 points]	III [5–2 points]	
Women	40 (69.0%)	16 (27.6%)	2 (3.4%)	58 (100%)
Men	61 (77.3%)	13 (16.4%)	5 (6.3%)	79 (100%)
Total	101 (73.7%)	29 (21.2%)	7 (5.1%)	137 (100%)
		$x^2(2)=3.724$; $p>0.05$		

Table 4 presents the final results according to the age of the respondents according to the Prolo scale. The most numerous group were patients aged 40–49 (51 people) and then 30–39 (46 people). The best results

Table 4. PS and age

Age	PS			Total
	I [10–8 points]	II [7–6 points]	III [5–2 points]	
Up to 29 years	7 (100%)	0 (0%)	0 (0%)	7 (100%)
30–39 years	40 (87.0%)	5 (10.8%)	1 (2.2%)	46 (100%)
40–49 years	41 (80.4%)	9 (17.6%)	1 (2.0%)	51 (100%)
50–59 years	21 (77.8%)	4 (14.8%)	2 (7.4%)	27 (100%)
60–69 years	0 (0%)	3 (50.0%)	3 (50.0%)	6 (100%)
Total	109 (79.6%)	21 (15.3%)	7 (5.1%)	137 (100%)
		$x^2(8)=4.566$; $p>0.05$		

were obtained in patients up to 50 years of age (range of 30–39 years), and the worst in the age range of 60–69 years. However, these differences turned out to be statistically insignificant.

Table 5 presents the social and economic situation patients depending on the type of work performed. Patients performing manual labour constituted the majority of the studied population (91 people). In this group in 74.7% of cases a very good social and economic situation was achieved, and a poor situation in 5.5% of cases. A relationship was observed between the type of work performed and the social and economic situation of the respondents ($p<0.05$).

Table 5. PS and type of work performed

Type of work performed	PS			
	I [10–8 points]	II [7–6 points]	III [5–2 points]	Total
Mental	33 (71.8%)	11 (23.9%)	2 (4.3%)	46 (100%)
Physical	68 (74.7%)	18 (19.8%)	5 (5.5%)	91 (100%)
Total	101 (73.7%)	29 (21.2%)	7 (5.1%)	137 (100%)
	$x^2(2)=5.728$; $p<0.05$			

Table 6 presents the final results in the Prolo scale depending on the location of the lesion. The best results were obtained comparably for the location of the lesion at the level of L4-L5 (74.1% of cases) and L5-S1 (73.5%). There were slightly more unsatisfactory results (9.2%) among the L4-L5 locations compared to the L5-S1 (2.4%). These differences turned out to be statistically insignificant.

Table 6. PS and the location of the lesion

Location	PS			
	I [10–8 points]	II [7–6 points]	III [5–2 points]	Total
L4-L5	40 (74.1%)	9 (16.7%)	5 (9.2%)	54 (100%)
L5-S1	61 (73.5%)	20 (24.1%)	2 (2.4%)	83 (100%)
Total	101 (73.7%)	29 (21.2%)	7 (5.1%)	137 (100%)
	$x^2(2)=4.858$; $p>0.05$			

By assessing the social and economic situation of the respondents depending on the severity of pain (Table 7), it can be concluded that in all persons with mild pain intensity (group I VAS) — 9 people, a very good social and economic result was obtained (group I PS). It can also be noticed that among people with moderate (group II VAS) and strong (group III VAS) intensity of pain, there is a tendency to an unsatisfactory social and economic result (group III PS). The obtained results between individual groups turned out to be statistically significant ($p<0.05$).

Table 7. PS and the intensity of pain

VAS	PS			
	I [10–8 points]	II [7–6 points]	III [5–2 points]	Total
I [mild]	9 (100%)	0 (0%)	0 (0%)	9 (100%)
II [medium]	74 (77.1%)	17 (17.7%)	5 (5.2%)	96 (100%)
III [severe]	18 (56.3%)	12 (37.5%)	2 (6.2%)	32 (100%)
Total	101 (73.7%)	29 (21.2%)	7 (5.1%)	137 (100%)
	$x^2(2)=6.322$; $p<0.05$			

Table 8 shows the results of the social and economic situation in relations to the patient's body weight expressed by the BMI index. The best results in PS were obtained by people with normal body weight — 95.2% of the respondents. Obese people obtained only a good (90.9% of the respondents) and unsatisfactory (9.1% of the respondents) result in PS. The differences in the obtained results turned out to be statistically significant ($p<0.05$).

Table 8. PS and body weight

BMI	PS			
	I [10–8 points]	II [7–6 points]	III [5–2 points]	Total
I [correct]	39 (95.2%)	1 (2.4%)	1 (2.4%)	41 (100%)
II [overweight]	62 (83.8%)	8 (10.8%)	4 (5.4%)	74 (100%)
III [obesity]	0 (0%)	20 (90.9%)	2 (9.1%)	22 (100%)
Total	101 (73.7%)	29 (21.2%)	7 (5.1%)	137 (100%)
	$x^2(4)=5.981$; $p<0.05$			

Discussion

Lumbosacral discopathy is a disease that causes numerous functional limitations of neurological and orthopaedic grounds. They may then appear, among others muscle atrophy, never conduction disorders, excessive paraspinal muscle tension or destabilization of the spine level affected by discopathy. Therefore, diseases

of the spine significantly affect the perceived quality of life, professional and emotional sphere of patients [14].

Surgical treatment of the lumbosacral disc disease is considered the final method of treatment and is used in approximately 15% of patients. The main indications for surgical treatment include: pressure on the roots of the spinal nerves, resulting from the narrowing of the lumen of the spinal canal, confirmed by imaging examination (MRI) and sudden incidents with massive pain symptoms with neurological motor and sensory deficits, as well as the lack of desired improvement after about 6 weeks if inoperable treatment (pharmacotherapy, physiotherapy) [15]. Indications for surgery are always individual and depend on the general and local clinical condition. Surgical treatment is associated with the possibility of intraoperative and postoperative complications, both local and systemic. However, it should be taken into account that the possibility of removing the resulting pathology gives a greater chance of complete recovery than for complications after the procedure [6,9].

In the study group, it was observed that the social and economic situation of patients with diagnosed lumbosacral discopathy improved significantly after surgery. There was also a relationship between the type of work performed and the social and economic situation of the respondents. Moreover, in all persons with mild pain intensity (group I VAS) — 9 people, obtained a very good social and economic result (group I PS). It can also be noticed that among people with moderate (group II VAS) and severe (group III VAS) intensity of pain, there is a tendency to an unsatisfactory social and economic result (group III PS). On the other hand, the best results in PS were obtained by people with normal body weight — 95.2% of respondents ($p<0.05$). The studies conducted by Rohrmoser et al. [16] also assessed the impact of surgical treatment in patients with degenerative lumbar spine disease on pain, disability and quality of life of patients. It was shown that 82.5% of patients were satisfied with the result of the surgery in the period from 6 to 12 months after the intervention. After the surgery, the average pain scores improved (201.3%), the degree of disability regressed (39.7%), the physical quality of life improved (42%) and the mental sphere improved (37.8%). In turn, studies conducted by Jabłońska et al. [17] showed that before surgery of the lumbar spine, symptoms of depression were present in 35.6% of patients, while in the first postoperative evaluation in 18.1% of patients, and 6 months after surgery in 23.6% of patients. There was also a statistically significant correlation ($t=0.361$; $p=0.000$) between pain and depression 1 week after surgery (second rating) and 6 months after surgery ($t=0.563$; $p=0.000$) (third rating). The studies by Celej-Szuster et al. [18] showed that lumbar discopathy significantly reduces the functional capacity of patients. Half of the 103 respondents scored 21–85 points on the Barthel scale, which indicates a disability and means that these people were partially unable to cope with the activities of daily living. On the other hand, in the studies by Kułak and Kondzior [19] conducted among patients with lumbosacral spine discopathy, the majority of respondents reported moderate pain. Due to illness, absenteeism from work was on average (55.89±71.37) days. Interestingly, sickness absence did not depend on the severity of pain, symptoms of depression or acceptance of the disease. On the other hand, Celej-Szuster et al. [20] showed a high correlation between pain intensity according to VAS scale (descriptive interpretation) in the lumbar spine and disability caused by pain calculated on the basis of the Oswestry Questionnaire Index (ODI). Patients with moderate and severe pain in the lumbar region more often indicated significantly reduced performance caused by pain, i.e. 40–59% of the ODI index. Among the factors associated with the occurrence of lumbosacral pain, BMI is the most frequently mentioned and described. In the conducted studies, a relationship has been observed between high BMI values and chronic back pain [21,22]. In their studies, DePalma et al. [23] even emphasized that the height of the BMI index may be closely related to the cause of pain in the lumbosacral spine.

Conclusions

1. The social and economic situation of patients with diagnosed lumbosacral discopathy improves significantly after surgery.
2. There was a relationship between the type of work performed and the social and economic situation of the respondents.
3. Among the clinical factors, the degree of pain intensity and the patient's body weight significantly influenced the social and economic situation of the respondents.

Implications for Nursing Practice

Back pains in the lumbosacral region affect various areas of human functioning. Various physiotherapeutic methods (electrotherapy, laser therapy, ultrasound) and kinesiotherapy are used in the treatment of back pain syndromes. Manual therapy procedures are also increasingly used. Patients after surgery require special holistic care and emotional support. It is also important that the nursing staff provide information on how to remain completely independent for as long as possible and how to prevent the recurrence of back pain.

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