

Functional Capacity of Patients Operated on Due to Lumbar Discopathy in the Early Postoperative Period

Wydolność funkcjonalna pacjentów operowanych z powodu dyskopatii lędźwiowej we wczesnym okresie pooperacyjnym

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Abstract

Introduction. The main symptom of lumbar disc herniation is pain, which particularly hinders the functioning of the patient. Functional capacity should be understood as the ability to be independent of other people in meeting basic needs, such as: movement, nutrition, controlling the body's physiological activities or performing hygiene activities.

Aim. The aim of the study was to assess the functioning of patients after lumbar spine surgery in the early postoperative period.

Material and Methods. The study included a group of 52 adult patients after lumbar spine surgery performed at the Department of Neurosurgery of the 10th Military Clinical Hospital with the Polyclinic of the SP ZOZ in Bydgoszcz. The method of diagnostic survey was used, the tools were: interview questionnaire, VAS scale, Roland-Morris Low Back Pain Questionnaire, Oswestry Questionnaire and Beck Depression Scale.

Results. More than half of the examined patients after lumbar spine surgery felt the intensity of pain at the average level, very strong pain affected nearly 10% (mean 4.44; SD 2.03). According to the Roland-Morris Low Back Pain Questionnaire, nearly 60% of patients showed a moderate level of disability and 35% a high level of disability (mean 15.33; SD 3.85). According to the Oswestry Questionnaire, 53% of patients had moderate disability, 31% had severe disability (mean 54.7%, SD 11.3%). 83% of respondents did not show symptoms of depression (mean 6.98; SD 5.63).

Conclusions. The functional capacity of patients after surgery of the lumbar spine turned out to be low, a large part of the respondents showed a medium and high degree of disability. The degree of disability increased with the severity of pain. (JNNN 2022;11(4):147–153)

Key Words: discopathy, functional capacity, patient

Streszczenie

Wstęp. Głównym objawem dyskopatii lędźwiowej są dolegliwości bólowe, które szczególnie utrudniają funkcjonowanie chorego. Wydolność funkcjonalną należy rozumieć jako zdolność do bycia niezależnym od innych osób w zaspokajaniu podstawowych potrzeb, takich jak: poruszanie się, odżywianie, kontrolowanie czynności fizjologicznych organizmu czy wykonanie czynności higienicznych.

Cel. Celem pracy była ocena funkcjonowania chorych po operacji kręgosłupa lędźwiowego we wczesnym okresie pooperacyjnym.

Materiał i metody. Badaniem objęto grupę 52 chorych dorosłych, po zabiegach operacyjnych odcinka lędźwiowego kręgosłupa, przeprowadzonych w Klinice Neurochirurgii 10 Wojskowego Szpitala Klinicznego z Polikliniką SP ZOZ w Bydgoszczy. Zastosowano metodę sondażu diagnostycznego, narzędziami były: kwestionariusz wywiadu, skala VAS, Kwestionariusz Bólu Krzyża Rolanda-Morrisa, Kwestionariusz Oswestry i Skala Depresji Becka.

Wyniki. Ponad połowa badanych pacjentów po operacji kręgosłupa lędźwiowego odczuwała natężenie bólu na poziomie średnim, bardzo silny ból dotyczył blisko 10% (średnia 4,44; SD 2.03). Według Kwestionariusza Bólu Krzyża Rolanda-Morrisa blisko 60% pacjentów wykazało średni poziom niepełnosprawności a 35% wysoki poziom niepełnosprawności (średnia 15,33; SD 3,85). Według Kwestionariusza Oswestry 53% pacjentów miało mierną niesprawność, 31% poważną niesprawność (średnia 54,7%, SD 11,3%). 83% respondentów nie przejawiało objawów depresji (średnia 6,98; SD 5,63).

Wnioski. Wydolność funkcjonalna pacjentów po operacji kręgosłupa odcinka lędźwiowego okazała się niska, duża część badanych wykazała średni i wysoki stopień niepełnosprawności. Stopień niepełnosprawności rósł wraz z nasileniem dolegliwości bólowych. (PNN 2022;11(4):147–153)

Słowa kluczowe: dyskopatia, wydolność funkcjonalna, pacjent

Introduction

Back pain in the lumbar section is the second most common cause of temporary incapacity for work, right after infectious diseases of the respiratory system [1]. More and more people complain about back pain, which has become not only a medical and social problem [2], but also an economic one [3,4]. Epidemiological data indicate that about 80% of the population suffers from diseases of the spine [2,5,6]. An important role in this is attributed to diseases of the intervertebral disc. Intervertebral disc disease is defined as a set of structural changes resulting from a disorder of the arrangement of the elements forming the intervertebral disc and the spinal canal [7,8].

Lumbar disc herniation is the most common disorder causing pain in this area [3,4,9–11]. The occurrence of pain depends on the stage of disc disease. Initially, the pain may be periodic, point pains located in the midline at the level of the segment affected by the discopathy (simple discopathy), while at the stage of hernia of the nucleus pulposus there is already constant radicular pain, which can only reduce its intensity. In the event of a sudden, massive displacement of the disc masses in the midline, a neurological deficit below the lesion level may occur in the form of paresis of the limbs, disorders of all types of sensation, and sphincter disorders [9].

Treatment of back pain should be comprehensive. In the first place, the conservative treatment of ailments is focused on (painkillers, various forms of physiotherapy and balneotherapy). However, in the absence of improvement and using the possibilities of conservative treatment, surgical treatment should be considered [3,5,12–14].

Decisions about the need for surgical treatment are made on the basis of the radiological images' compliance with the patient's clinical picture. The effects of treatment in most patients are good or very good. Better results are achieved in young people. Treatment failures are associated with physical work, a long disease process, extensive surgical access or neurological deficits [6]. Despite surgical treatment, relapses may occur [6,10,15]. From 3 to 34% of patients after surgery for disc disease complain of recurrent pain after surgery [12]. The

recurrence of the disease may be influenced by factors such as the age of the patients, physical activity and comorbidities [6].

Back pain, unfortunately, is related to the deterioration of functional efficiency, which reduces the quality of life of patients [15–17]. Functional capacity should be understood as the ability to be independent of other people in meeting basic needs, such as: movement, nutrition, controlling the body's physiological functions and performing hygienic activities [8].

Despite various treatment options (conservative, surgical), spinal pain is sometimes persistent, chronic, with a tendency to recur and is a problem of the 21st century [13]. The effect of a chronic disease proves is not only changes in physical functioning, but over time there may be changes in the mental sphere, especially in the emotional sphere, which may also result in changes in the social sphere [4].

The main aim of the study was to assess the functioning of patients with lumbar discopathy in the early postoperative period.

Material and Methods

The research was conducted at the Department of Neurosurgery of the 10th Military Clinical Hospital with the Polyclinic SP ZOZ in Bydgoszcz, for which the consent of the Bioethics Committee was obtained (KB number 514/2016). The study included 52 adult patients after lumbar spine surgery due to lumbar disc herniation. The group of respondents did not include patients undergoing minimally invasive procedures due to spinal disease, e.g. after thermolesions [13].

Among the respondents, 48% (25 people) were women, 52% (27 people) were men. The mean age was 51.79 years (SD 13.37), the youngest patient was 24 years old, the oldest 77 years old. Most patients were in the 51–60 age group. 75% (39 people) were residents of the city. The vast majority, 71% were professionally active people. Over 42% of respondents had secondary education, people with vocational and higher education accounted for nearly 29% each. The majority of patients

lived with their families (86.54% — 45 people). 63% of the respondents (33 respondents) were married people. Detailed data on patients included in the study are presented in Table 1.

Table 1. Characteristics of the study group

Variable	N	%
Gender		
Women	25	48
Men	27	52
Age		
Up to 30 years	2	4
31–40 years	12	23
41–50 years	7	13.5
51–60 years	14	27
61–70 years	12	23
Over 70 years	5	9.5
Place of residence		
Village	13	25
City	39	75
Education		
Vocational	15	29
Secondary	22	42
Higher	15	29
Marital status		
Single	5	10
Married	33	63
Widow/Widower	7	13.5
Divorced	7	13.5
Type of residence		
With family	45	86
Alone	6	12
Other	1	2
Professional activity		
Professional work	37	71
Pensioner	15	29

The following tools were used in the study, which were filled in by patients on the day preceding discharge home:

1. Personal questionnaire used to describe a group of patients due to socio-demographic characteristics.
2. Visual Analogue Scale (VAS). The VAS scale is a 10-cm segment, the beginning of which 0 — is defined as no pain at all, and the end 10 — as the strongest pain that the patient can imagine. The patient marks a point on the scale between its two ends in the place that best corresponds to

the intensity of pain experienced. The result is expressed in centimetres. The obtained results were interpreted as follows: 0 — no pain, 1–3 — mild pain, 4–7 — moderate pain, 8–10 — very strong pain [15].

3. *Oswestry Disability Index (ODI)*. It is a scale developed for patients suffering from pain in the lumbosacral spine. The scale assesses disability in ten spheres of everyday functioning (independence, pain intensity, lifting heavy objects, sleeping, walking, sitting, standing, social life, travel, sexual sphere, change in the nature of pain). Answers are scored from 0 to 5 points. The cumulative result is presented on a 0–50 point scale or on a 0–100% percentage scale, specifying the degree of disability of the examined person. The results of the questionnaire are as follows: 0–20% no disability, 21–40% — slight disability, 41–60% — moderate disability, 61–80% — severe disability, 81–100% — complete disability [15].
4. *Roland Morris Disability Questionnaire (RMDQ)*. It was created for people with the described disease. It consists of 24 questions about problems that may arise in the patient's everyday life in connection with back pain. The patient answers “yes” or “no” to the questions. “Yes” answers are added together. For each affirmative answer, 1 point is added. The more points the patient scores, the more disabled he is. When interpreting the obtained points, the deficits in functioning (quality of life) are determined: 0–3 points — no/slight deficit, 4–10 points — medium, 11–17 points — large, 18–24 points — very large [10,15].
5. Beck Depression Scale. The tool consists of 21 points. The assessment is based on the intensity of symptoms, on a scale of 0–3. For each question, the patient gives the answer that best reflects his current condition. The scale is interpreted as follows: 0–11 — no depression, 12–26 — mild depression, 27–49 — moderate depression, 50–63 — severe depression [12].

All obtained data were entered into the STATISTICA 13 database and then subjected to the statistical analysis. The Mann–Whitney test and the Spearman correlation test were used. When verifying all the analyses, the significance coefficient at the level of $\alpha=0.05$ was used, which made it possible to consider variables statistically significant at $p<0.05$.

Results

Surgical treatment of lumbar disc herniation in the early postoperative period does not cause complete pain relief, as expected. Although in practice you can often

hear that the pain you feel is of a different nature and concerns, for example, only the operated site. Therefore, one of the elements of the study was the assessment of pain after lumbar disc herniation surgery. The mean pain level on the day before discharge from the ward was 4.44 points on a 10-point VAS scale (SD 2.033,

median 4.00) (Figure 1). 37% (19 people) of the patients indicated weak pain, 53% of the examined patients (28 people) described the intensity of pain as medium, nearly 10% of the patients (5 people) felt very strong pain. It was a subjective assessment of pain, without indicating a specific location of the pain.

According to the Roland and Morris Low Back Pain Questionnaire, the mean functional capacity was 15.33 points (SD 3.85, median 15). Only 6% of patients (3 people) after spinal surgery showed a low degree of disability before being discharged home, which means that these people functioned very well and showed a high level of independence. More than half of the patients, i.e. 59% (31 people), indicated an average level of disability after the procedure. This proves their partial functional capacity. These patients were able to perform only some activities of daily living on their own. As many as 35% of respondents (18 people) indicated a high level of disability (Figure 2). Their functioning turned out to be significantly limited. These patients needed help with almost every activity.

According to the Oswestry questionnaire, the average of the results obtained from patients was 54.7% (SD 11.3%, median 52%). 14% of patients (7 people) after spinal surgery had a slight disability. This small group of patients coped very well in most spheres of everyday functioning. 53% (28 people) showed moderate disability. 31% of the respondents (16 people) indicated a serious disability (Figure 3). Only in one case a person indicated complete disability, had functional disorders within each of the examined spheres of life.

In the Beck Depression Scale, the mean score was 6.91 points (SD 5.63, median 6.50). It should be emphasized that 83% of patients (43 people) after the operation of the lumbar spine did not show symptoms of depression.

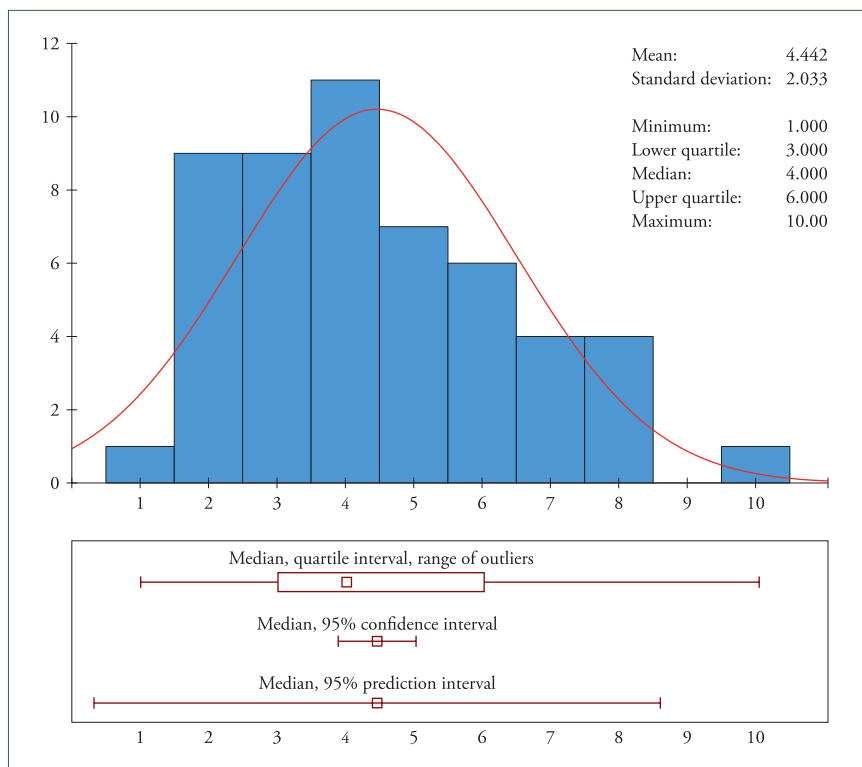


Figure 1. Distribution of pain scores on the VAS scale

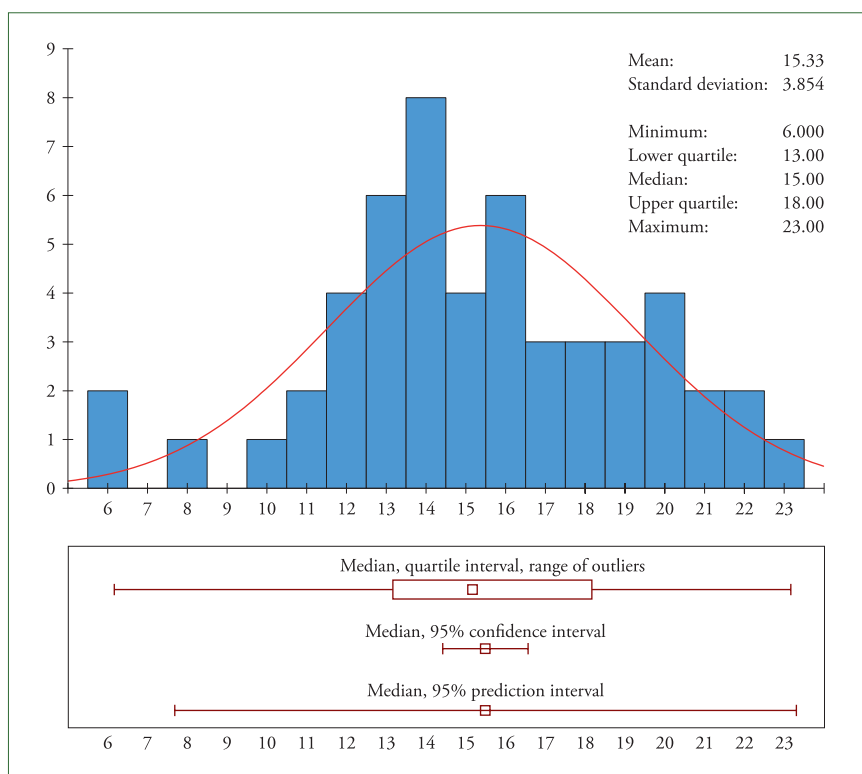


Figure 2. Distribution of the results from the Roland and Morris Low Back Pain Questionnaire

Only 17% of the respondents (9 people) had mild symptoms of depression (Figure 4).

The results of the correlation of the analysed parameters obtained from the standardized questionnaires indicated the existence of statistically significant relationships only in the case of the Oswestry questionnaire with the VAS scale and the Roland and Morris Low Back Pain Questionnaire. The correlation of the results for the other parameters did not indicate a statistically significant relationship between the questionnaires. The obtained results show that the level of disability from the Oswestry questionnaire is related to pain and the results from the Roland and Morris low back pain questionnaire. As the disability scores increased, so did the VAS pain scores and the Roland and Morris low back pain questionnaire scores (Table 2).

A statistical analysis was made between socio-demographic factors and the results obtained from individual questionnaires. Factors such as age, gender, place of residence, professional activity, education and place of residence did not affect the results obtained from individual questionnaires, no statistically significant differences were found ($p > 0.05$).

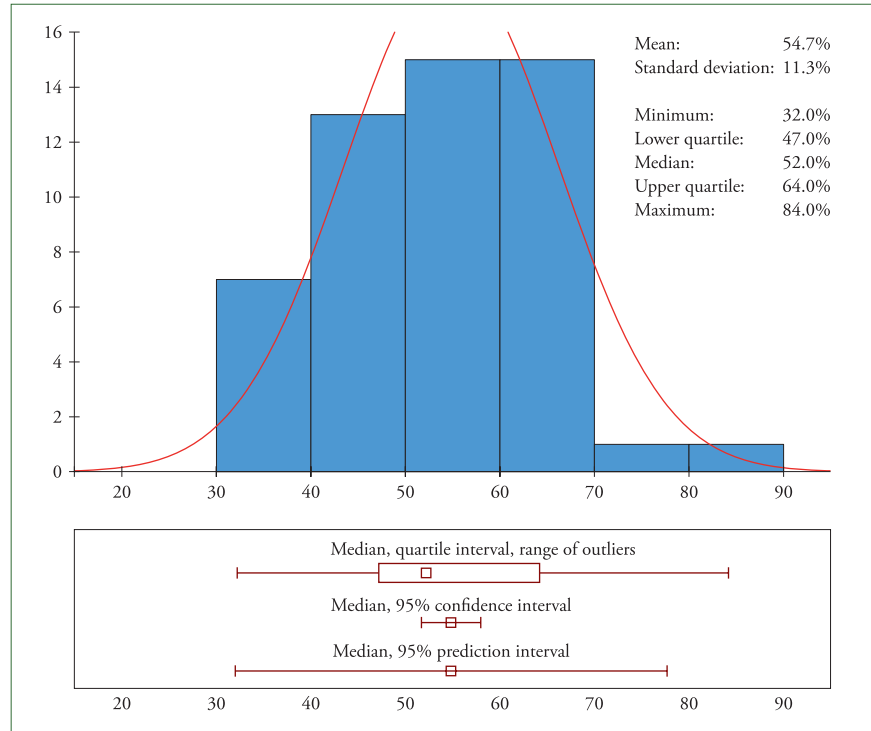


Figure 3. Distribution of Oswestry scale scores

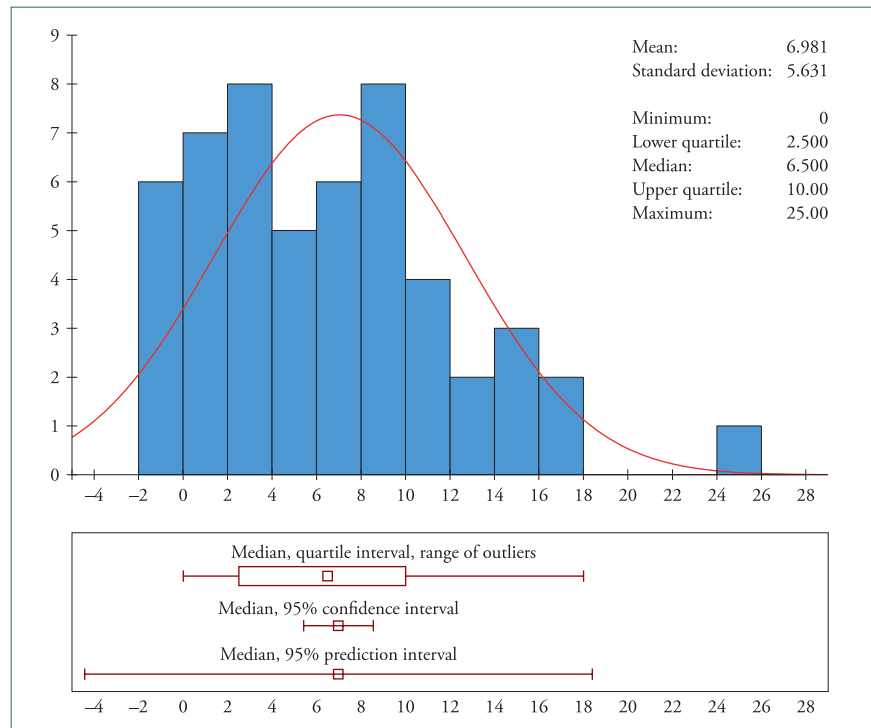


Figure 4. Distribution of scores from the Beck Depression Scale

Table 2. Correlation analysis of the results from standardized questionnaires

Questionnaires	VAS scale	Roland and Morris Low Back Pain Questionnaire	Depression Scale	Oswestry
VAS Scale	1.000			
Roland and Morris Low Back Pain Questionnaire	0.218	1,0.0		
Depression Scale	0.148	-0.078	1.000	
Oswestry	0.330	0.312	0.199	1.000

Spearman rank correlation test

Discussion

Pain ailments due to lumbar or lumbosacral disc herniation significantly hinder or even prevent daily functioning. Performing everyday activities, i.e. washing, dressing, providing basic needs, may be unattainable. In advanced disc herniation with deficit neurological symptoms or severe pain radiating to the lower limbs, the functionality is significantly reduced. It should be noted that functional capacity is of great importance for a person, gives a sense of independence, positively affects the physical and mental state [16].

Surgical treatment of back pain is used in only 3–10% of cases. Indications for surgical treatment are long-lasting pain that does not respond to conservative treatment or the occurrence of paralytic symptoms. It is estimated that after surgery 90% of patients achieve pain relief, although not every procedure eliminates this problem [18].

In Czaja's research conducted on patients before surgery, 82% of the patients felt pain at the average level, and 15% severe pain [15]. In own studies, pain was not assessed before surgery, but only after surgery, on the day before being discharged home. Unfortunately, in the early postoperative period, patients experience pain, which is confirmed by own research as well as that of other authors. In own research, 37% of patients felt mild pain, more than 50% of patients felt pain at the average level, and 10% of patients experienced severe pain. The mean pain was 4.44 (0–10 VAS). From a practical point of view, it should be emphasized that in this early postoperative period, pain is also a consequence of surgical intervention, but is also associated with the presence of a postoperative wound. In the studies of Jabłońska, after surgical treatment on the day of discharge, 50% of the patients felt mild pain, 39% of the respondents experienced moderate pain 6.5% felt strong pain. Before surgery, in the author's study, over 52% experienced moderate pain, and nearly 40% experienced severe pain [8]. In another study by Jabłońska, pain before surgery in 35% of patients with lumbosacral disc disease was at an average level, while severe pain was felt by 33.5% of respondents. After the procedure, a decrease in pain was observed, moderate pain was felt by 25.5%, severe pain only by 4.8% [7]. The first and second studies confirm the reduction of pain after spinal surgery.

In research by Kołpa, the average pain before the lumbar disc herniation surgery was above 6 points (6.14; 6.30; 6.98), while half a year after the surgery the patients felt pain within the range of about 3 points (2.85; 2.69; 3.33). It was shown that before the procedure women felt more pain than men ($p < 0.05$), this difference was not observed in the late postoperative period [10]. In the study by Olczak, before surgery, all patients reported pain, and on the fifth day after surgery, 73% of respondents felt these ailments, and after 1 month

— 60% of respondents. Importantly, a decrease in the painkillers taken and an improvement in the independence of the subjects were noted [14].

In the studies by Czaja, based on the Oswestry scale in patients before surgery, it was shown that almost half of the patients had a moderate degree of disability and ¼ had a serious disability [15]. Similar results were obtained by Celej-Szuster et al. (average number of points scored 56.17%) [17]. On the other hand, after surgical treatment, in own research, more than half of the patients had a moderate degree of disability and more than ¼ of them had a serious degree of disability (average 54.7%). Therefore, it can be concluded that surgical treatment does not slightly affect the severity of the patients' disability.

In own research based on the Roland–Morris Low Back Pain Questionnaire in patient after surgery, the mean value was 15.33, which indicates a significant loss in functioning. On the other hand, in studies by Kołpa, patients before surgery obtained an average of 11.47 points, which also indicated a significant decrease in the quality of life. Half a year after the procedure, this index significantly decreased in this group and amounted to 7.31 (average loss) [10]. According to the studies by Czaja, 45% of the patients had a moderate loss of quality of life before surgery and over 37% had a large loss [15]. For comparison, in our own research, in the early period after the procedure, almost 60% of patients had a large loss, and 35% a very large one, in functional capacity. This may suggest worsening of disability in the early postoperative period as a temporary consequence of the postoperative procedure.

Research by Celej-Szuster et al. confirms that pain associated with lumbar disc herniation impairs the functional capacity of patients. The authors conducted a study of functional capacity using the Barthel scale, in which it was shown that half of the respondents were classified in the second category of care, defining the condition of the respondents as moderately severe, and the other half in the first category — light condition [16].

The literature emphasizes that along with pain in the lumbar spine, patients may develop psychogenic disorders, including depression, which may also translate into changes in the functioning of the patient. In own research only 17% of patients showed symptoms of mild depression. In the study by Jabłońska et al., before surgery for lumbar disc disease, nearly 36% of patients had symptoms of depression, while in the early postoperative period, symptoms of mild depression occurred in 18% of patients, which is comparable to own studies. The authors also showed that the most common symptoms of depression were among people with primary education and working in a standard position [12].

According to Wójcik, postoperative management should focus on pain control, as well as gradual

improvement associated with the introduction of everyday activities. Early postoperative rehabilitation of patients after surgery should include kinesitherapy and psychotherapy, which should counteract functional disability [5].

Conclusions

The functional capacity of patients after lumbar spine surgery in the early postoperative period turned out to be low, a large part of the respondents showed a medium and high degree of disability. The degree of disability increased with the severity of pain.

Implications for Nursing Practice

Pain in the case of disc disease is a leading problem. Patients in the early period after lumbar disc herniation surgery still experience moderate pain, which affects their daily functioning. Patients should be alerted to the need for analgesic treatment in this early post-operative period. In addition, the education of patients on health-promoting activities, important for people with lumbar disc disease, should be started or continued, which should minimize the problem of pain and then minimize the risk of recurrence of the disease.


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