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Quality of Life, Independence, Support in Patients Before and After Surgery with Head Cancer

Edyta Laska, MD, PhD*

Andrzej Frycz Modrzewski University in Krakow, Poland.

Abstract

Introduction: All over the world we are seeing an increase in cases of head cancer, which affects the quality of life and independence. If we know the health problems before and after surgery, we know that there are headaches, aphasia, epileptic seizures, limb paresis, affecting self-reliance or quality of life, we are able to improve this through therapeutic, psychological, rehabilitative measures. The aim of the study was to assess the quality of life, self-efficacy and social support of patients before and after surgery for head cancer, whether it is dependent on tumor type, location, stage.

Methods: The study was conducted in 93 patients with head cancer from March 2023 to June 2024 at the Department of Neurosurgery of St. Raphael's Hospital in Krakow. Approval was obtained from the bioethics committee and the clinical trials research team.

The study was carried out by analyzing medical records in Medis software, as well as by diagnostic survey method using standardized research tools: The WHO Quality of Life (WHOQOL)-BREF, the Lawton scale, the AIS quiz and the Zimeta Multidimensional Scale of Perceived Social Support. Statistical analysis was developed in IBM SPSS 29.0. Differences were assessed using Wilcoxon and Kruskal-Wallis tests. The cut-off for significance level was $p<0.05$.

Discussion: The assessment of patients' quality of life before and after surgery incl. the four domains showed statistically significant differences for the somatic and psycho-logical domains. In both domains, higher scores were observed in the post-operative measurements.

There were statistically significant differences between groups for the AIS scale before and Lawton scale after surgery.

Conclusions: Quality of life was higher after surgery for the somatic and psychological domains. It is higher in cancer stage IV before surgery, while it is higher in stage I and II after surgery. Patient support was higher after surgery from family and friends. Patients' quality of life, self-efficacy is dependent on the type of cancer, location and stage.

Keywords: Head cancer; Neurosurgery; Quality of life; Patient self-efficacy; Social support; Tumor location; Stage.

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Correspondance: *Edyta Laska, Collegium Medicum, Faculty of Health Sciences, Andrzej Frycz Modrzewski Krakow University, Gustawa Herlinga- Grudzińskiego 1, 30 -705 Krakow, Poland. Email: elaska@afm.edu.pl & edytalaska1@o2.pl*

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Introduction

Tumors of the head organs are a significant clinical and epidemiological problem. Invariably in Poland for several years, the incidence rate among malignant neoplasms has varied between 5.5% and 6.2%, which translates into approximately 5500 to 6000 new cases per year (KRN 2020) and 3800 deaths. Cancers in a given anatomical area are most common in people over 45 years of age. The incidence is almost five times higher in men than in women.

The choice of treatment method is related to factors that depend on the type of tumor and its individual characteristics, i.e. location, stage and clinical differentiation. The patient's personal factors, i.e. age, performance status, presence of comorbidities or nutritional status, are also important factors in the choice of therapy. The standard treatment pathway for head cancer patients in early clinical stages is surgery and/or radiotherapy [1].

Quality of life is one of the parameters characterising the success of brain tumor treatment, along with overall survival and disease-free life.

Contemporary surgical procedures used in neurosurgery can cause a reduction in the quality of life of patients with brain tumors, but only in the early postoperative period. Histopathological diagnoses of these tumors affect patients' quality of life [2].

The most common malignant tumors are glioma (48.6%) and proliferative/anaplastic stamen (11.6%). Among benign tumors, the most common are meningiomas (53.9%), pituitary tumors (24%) and nerve sheath tumors (12.1%). In Poland, the most frequently diagnosed tumors include meningioma (25%), pituitary tumors (25%) and glioma (15%). Low-grade glioma is most common in young and middle-aged people, whereas malignant glial tumors, especially glioblastoma, occur in older people [3-5,].

Patients with brain tumors who are eligible for surgery may have clinical signs of disease, but some patients have no signs of disease (the only sign of disease was a single epileptic seizure, for example). However, the need for intracranial surgery is associated with the risk of neurological symptoms such as paresis, speech disorders, etc., or their severity, which significantly impede the functioning of these patients, and the patients themselves will become dependent on others. In addition, the histopathological diagnosis of a tumor can significantly affect quality of life. Patients with brain tumors (high-grade glioma, metastases) have to undergo follow-up treatment, which causes great distress and may require further hospitalisation, side effects and economic outlay. Therefore, according to the authors, it is important to undertake quality of life studies even before aggressive treatment is started. Therefore, it is important to assess what quality of life looks like in different groups, e.g. in terms of histopathological diagnosis in the early and late postoperative period [2].

In the approach to the oncology patient, quality of life has become a parameter also as important as other parameters characterizing the whole process and course of treatment. It is now treated on a par with figures representing data such as overall survival, disease-free life and life expectancy with controlled disease.

Malignant brain tumors are broadly divided into primary brain tumors (originating in brain tissue) and secondary tumors (metastases). Median survival for primary tumors ranges from a few months to several years, while for metastatic tumors it is a few months. In addition, patients with metastatic tumors may suffer from other systemic disorders resulting from the primary disease. In such cases, the aim of treatment is to malign and prevent complications. Therefore, maintaining a good quality of life is a priority in patients with malignant brain tumors [6-8].

Surgical treatment of brain tumors is preferable to other methods because it allows a histopathological diagnosis to be established; surgery results in a rapid reduction of the tumor mass, which will reduce or eliminate the patient's neurological symptoms and cognitive deficits. On the other hand, surgical treatment and perioperative trauma can lead to neurological and cognitive deficits. These deficits can be short-lived and result in a temporarily reduced quality of life.

Nowadays, quality of life assessment is often used in clinical trials as an indicator of disease severity, and perioperative testing using a scale to assess quality of life is an important parameter to test among patients who undergo procedures using modern surgical technology. The instruments used in the authors' study are recognized and widely used tools to assess quality of life in multidimensional aspects. Quality of life can be impaired by many factors. These certainly include any neurological deficits, epilepsy, as well as fear and anxiety related to the procedure and the consequences of surgical treatment. This was supported in a study by Giovagnola, who revealed significant anxiety among patients in a pre-operative survey related to the time spent waiting for diagnosis. In Bunevičiuset's study, factors that led to reduced pre-operative quality of life included insomnia, fatigue, headaches and uncertainty about the future. Cheng et al. analyzed patients with glial brain tumors in the preoperative period, where, when quality of life was examined using the EORTC QLQ-30 questionnaire, the median for the emotional area was 66.7; for the social area up to 75.0; for the cognitive area up to 83.3; for the physical area up to 86.7; and for the functional area up to 91.7 (quality of life score on a linear scale from 0 to 100, the higher the value, the better the results). These results indicate that patients had more difficulties in the emotional and social areas compared to the cognitive, physical and functional areas [2].

In Shin et al's study, patients with higher functional abilities had significantly better functioning and lower symptom scores on all QLQ-C30 and QLQ-BN20 items (lower score - lower symptom/problem severity) compared to patients with lower functional abilities on the Karnofsky scale. Patients with brain gliomas scored lower in terms of physical, cognitive and social functioning; in addition, there was uncertainty about the future and motor and communication deficits compared to patients with meningiomas. In the same study, the authors highlighted those patients who underwent brain tumor surgery alone had a better quality of life compared to patients who underwent surgery and follow-up treatment (poorer functioning, lower quality of life, greater uncertainty about the future, greater communication deficits). The rationale for this result may be that patients treated with combination therapy feel the severity of their disease takes much longer and causes side effects. In the study by Jakoli et al. no changes were observed in median EQ-5D scores after surgery, 0.76 versus 0.75 ($p = 0.419$), while daily routine activities were significantly altered ($p = 0.010$), leading to a worse outcome after surgical treatment. There were no significant changes in dimensions such as mobility,

self-care, pain/discomfort and anxiety/depression.

The situation is similar for patients with brain metastases and disorders caused by the underlying disease (the brain tumor may remain at a similar level). In the case of lower-grade primary tumors, deficits may not appear until after surgery, but, importantly, they disappear as a result of the anti-obesity treatment and rehabilitation implemented, so it is a temporary condition. Hence, in these patient groups, quality of life decreases significantly in the early postoperative period.

The lowest quality of life was recorded on the fifth post-operative day, and many symptoms, such as fatigue, nausea and vomiting, pain, dyspnoea, insomnia and lack of appetite, increased especially immediately after surgery. In addition, the histopathological diagnosis of the tumor affected quality of life. In the first postoperative period, reduced quality of life was observed in the group of low-grade glial tumors and benign tumors such as meningiomas and neuroblastomas. In contrast, 30 days after surgery, the lowest quality of life was observed in patients with metastatic tumors [2].

Most researchers agree that social connections have a salutary effect on an individual's mental health and well-being. Social support plays an important role in recovery and physical wholeness, and supports the healing process. Maintaining positive close relationships with others also helps to achieve balance in daily life and builds an individual's sense of psychological well-being [9].

The aim of the study was to assess the quality of life, independence and social support of patients before and after surgery for head cancer, whether it depends on the type of cancer, location, stage.

Materials and methods

The study was conducted from March 2023 to June 2024 at the Department of Neurosurgery of St. Raphael's Hospital in Kraków after obtaining approval from the management. Approval from the bioethics committee (KBKA 31/0/2023) and the Clinical trials.gov PRS (NCT 06395805) research team was obtained prior to the study. The study group comprised 93 patients who were scheduled for surgery for head cancer. Patients gave written informed consent to participate in the study, which targeted patients before surgery and after surgery (immediately before the patient was discharged home).

The method of patient recruitment was that every patient who was admitted to the ward with a diagnosis of head cancer and was qualified for surgery and gave written informed consent for the study and the processing of personal data was recruited into the study.

The inclusion criteria for the study group included patients who gave written informed consent to participate in the study before surgery, after surgery, and completed the questionnaires correctly. On the other hand, the exclusion criteria included patients who refused to participate further in the study during the course of the study, as well as when the questionnaires were not complete or correctly filled out.

Statistical analysis was then performed, where calculations were done in IBM SPSS 29.0 software. As the quantitative variables had distributions that deviated from the normal distribution, non-parametric methods were used for the analyses. Results of quantitative variables were presented using descriptive statistics. Differences between pre- and post-treatment results were assessed using Wilcoxon tests for dependent samples (paired t-tests). The significance of differences between three or more groups was assessed using Kruskal-Wallis tests. The cut-off for the significance level was $p<0.05$.

Schedule of study material collection

1. Before surgery, a diagnostic survey using a self-administered survey questionnaire of the author's own design cand, treatment and the standardised research tools outlined below.
2. After surgery in the hospital ward, a diagnostic survey using a questionnaire the standardised research tools presented below.
3. Analysis of medical records of patients included in the research group in the hospital database in Medis, taking into account data on the stage of the neoplastic lesion, its location and type of neoplastic lesion.

The study was carried out by analysing medical records in Medis and by diagnostic survey using a self-administered questionnaire on past illnesses and treatment and the following standardised research tools:

- Abbreviated version of the quality-of-life assessment questionnaire - The World Health Organization Quality of Life (WHOQOL) -BREF
- Lawton Scale I - ADL
- AIS questionnaire
- Zimet Multidimensional Scale of Perceived Social Support - MSPSS original version

Results

1. The assessment of patients' quality of life before and after surgery, taking into account the four domains: somatic, psychological, social and environmental, is shown in Table 1.

The assessment of patients' quality of life before and after surgery, taking into account the four domains, showed statistically significant differences between pre- and post-surgery measurements for the somatic domain ($p = 0.034$) and the psychological domain ($p = 0.005$). In both domains, higher scores were observed in the post-surgery measurements.

2. The assessment of the quality of life of patients before and after surgery at different tumor stages with respect to the four domains is shown in Table 2.

Assessment of the quality of life of patients before and after surgery in different tumor stages considering the four domains showed differences for all domains except the social domain before surgery.

3. The assessment of the quality of life of patients before and after surgery in the different location of the cancer lesion and type of cancer lesion with respect to the four domains is presented in Table 3.

Assessment of patients' quality of life before and after surgery in different location of cancer lesion and type of cancer lesion considering four domains showed differences between groups for somatic domain before and after surgery.

4. The assessment of patient support before and after surgery using the support scale is shown in table 4.

Assessment of patient support before and after surgery using the support scale showed statistically significant differences between pre- and post-measurements for each scale ($p<0.001$). The values of each scale increased after surgery.

5. The scores for the perceived social support scale, the AIS scale and the Lawton scale in relation to cancer stage are shown in table 5.

Scores on the perceived social support scale, the AIS scale and the Lawton scale before and after surgery showed statistically significant differences between the groups on the AIS scales before and the Lawton scale after.

6. The relationship between age and time to surgery and the individual domains and scales before and after surgery are shown in Table 6.

There was a statistically significant weak positive association between age and the Perceived Social Support Scale before and after surgery.

Table 1: Assessment of patients' quality of life before and after surgery considering the four domains.

	Tested value			
	Somatic domain (0-100) after - Somatic domain (0-100) before	**Psychological domain (0-100) after - Psychological domain (0-100) before**	**Social domain (0-100) after - Social domain (0-100) before**	**Domain environment (0-100) after - Domain environment (0-100) before**
Z	-2,117	-2,835	-0,051	-1,724
p	**0,034**	**0,005**	0,959	0,085
Descriptive statistics				
	M	Me	Sd	Minimal
Somatic domain (0-100) before	57,89	58,33	32,190	0
Somatic domain (0-100) after	62,54	66,67	29,479	-25
Psychological domain (0-100) before	37,10	38,46	13,125	12
Psychological domain (0-100) after	40,28	42,31	14,240	4
Social domain (0-100) before	73,12	75,00	18,960	8
Social domain (0-100) after	73,84	75,00	20,024	8
Domain environment (0-100) before	82,86	81,25	15,258	38
Domain environment (0-100) after	84,71	87,50	21,072	25

Table 2: Assessment of patients' quality of life before and after surgery at different tumour stages including the four domains.

Descriptive statistics by group												
	Grade											
	1			**2**			**3**			**4**		
	M	**Me**	**Sd**	**M**	**Me**	**Sd**	**M**	**Me**	**Sd**	**M**	**Me**	**Sd**
Somatic domain (0-100) before	63,49	66,67	30,960	65,00	58,33	28,315	27,27	16,67	26,112	46,67	25,00	35,832
Somatic domain (0-100) after	75,99	83,33	21,715	68,33	66,67	24,113	28,03	25,00	28,692	26,67	29,17	10,244
Psychological domain (0-100) before	39,19	38,46	13,438	41,03	38,46	10,657	25,52	26,92	10,501	29,23	28,85	12,054
Psychological domain (0-100) after	47,07	50,00	7,730	44,36	42,31	11,144	24,83	19,23	10,229	16,54	13,46	9,772
Social domain (0-100) before	74,80	75,00	17,796	74,17	75,00	20,802	64,39	58,33	10,601	72,50	75,00	24,548
Social domain (0-100) after	83,53	83,33	12,683	75,28	75,00	19,875	54,55	50,00	14,124	50,00	50,00	18,426
Environmental domain (0-100) before	85,57	84,38	15,340	86,15	85,94	13,798	71,31	71,88	5,004	74,38	70,31	18,796
Environmental domain (0-100) after	95,76	96,88	12,964	88,44	89,06	16,085	62,50	59,38	12,183	51,56	48,44	18,296

Kruskal- Wallis test results			
	H Kruskal-Wallis	df	p
Somatic domain (0-100) before	13,236	3	0,004
Psychological domain (0-100) before	14,843	3	0,002
Social domain (0-100) before	4,141	3	0,247
Environmental domain (0-100) before	12,616	3	0,006
Somatic domain (0-100) after	36,931	3	<0,001
Psychological domain (0-100) after	41,586	3	<0,001
Social domain (0-100) after	32,906	3	<0,001
Environmental domain (0-100) after	41,792	3	<0,001

Table 3: Assessment of the quality of life of patients before and after surgery in different location of the cancer lesion and type of cancer lesion considering the four domains.

Descriptive statistics by groups									
Location of the tumor lesion		**Somatic domain (0-100) before**	**Somatic domain (0-100) after**	**Psychological domain (0-100) before**	**Psychological domain (0-100) after**	**Social domain (0-100) before**	**Social domain (0-100) after**	**Environmental domain (0-100) before**	**Environmental domain (0-100) after**
Parietal lobe	Mean	70,31	62,50	41,11	37,74	82,81	74,48	88,67	82,23
	Median	75,00	70,83	42,31	38,46	87,50	70,83	93,75	75,00
	Standard deviation	29,964	30,581	14,911	14,542	17,865	20,965	14,383	21,792
Temporal lobe	Mean	44,79	44,79	37,50	35,58	65,63	58,33	77,34	73,83
	Median	41,67	45,83	36,54	34,62	75,00	58,33	75,00	75,00
	Standard deviation	33,016	25,173	11,023	15,758	28,325	26,352	15,468	24,375
Frontal lobe	Mean	60,71	63,69	37,64	40,11	64,88	65,48	79,46	84,15
	Median	75,00	70,83	38,46	42,31	70,83	66,67	75,00	85,94
	Standard deviation	39,822	26,273	14,795	17,314	22,922	24,862	19,715	27,476
Cystic meningioma	Mean	60,42	72,92	32,21	42,79	73,96	78,13	82,81	87,89
	Median	54,17	79,17	34,62	46,15	75,00	79,17	79,69	85,94
	Standard deviation	26,258	19,288	10,866	9,738	15,064	11,732	8,995	8,425
Pituitary	Mean	85,61	86,36	45,45	51,40	81,82	85,61	92,61	99,72
	Median	83,33	83,33	46,15	53,85	75,00	91,67	87,50	93,75
	Standard deviation	21,438	20,163	9,234	6,498	12,258	10,601	11,963	10,866
Others	Mean	45,14	56,48	33,55	38,57	70,83	75,69	79,86	83,16
	Median	41,67	50,00	34,62	42,31	75,00	75,00	75,00	85,94
	Standard deviation	27,195	31,567	12,492	14,109	15,874	17,409	14,417	20,270
Total	Mean	57,89	62,54	37,10	40,28	73,12	73,84	82,86	84,71
	Median	58,33	66,67	38,46	42,31	75,00	75,00	81,25	87,50
	Standard deviation	32,190	29,479	13,125	14,240	18,960	20,024	15,258	21,072

Kruskal-Wallis test results								
	Somatic domain (0-100) before	**Psychological domain (0-100) before**	**Social domain (0-100) before**	**Environmental domain (0-100) before**	**Somatic domain (0-100) after**	**Psychological domain (0-100) after**	**Social domain (0-100) after**	**Environmental domain (0-100) after**
H Kruskala-Wallisa	17,613	10,254	9,783	10,869	11,765	9,473	8,908	8,163
df	5	5	5	5	5	5	5	5
p	0,003	0,068	0,082	0,054	0,038	0,092	0,113	0,147

Table 4: Assessment of the quality of life of patients before and after surgery in different location of the cancer lesion and type of cancer lesion considering the four domains.

Wilcoxon test results			
	Scale of support family - after - Scale of support family - before	**Scale of support significant person - after - Scale of support significant person - before**	**Friend-after support scale - Friend-before support scale**
Z	-4,122[b]	-3,832[b]	-3,599[b]
p	<0,001	<0,001	<0,001

Descriptive statistics					
	Medium	**Mediana**	**Sd**	**Minimal**	**Max**
Scale of support family - before	26,34	28,00	3,806	12	28
Scale of support family - after	27,77	28,00	0,768	24	28
Scale of support significant person - before	25,89	28,00	5,299	4	28
Scale of support significant person - after	27,92	28,00	0,337	26	28
Support scale friend - before	26,08	28,00	4,420	4	28
Support scale friend - after	27,60	28,00	1,105	23	28

Table 5: Assessment in terms of perceived social support scale, AIS scale and Lawton scale before and after surgery.

Descriptive statistics							
Grade		**Perceived Social Support Scale before**	**Perceived Social Support Scale after**	**AIS before**	**AIS after**	**Lawton scale before**	**Lawton scale after**
1	Mean	78,98	83,05	23,57	26,07	23,81	23,67
	Median	84,00	84,00	24,00	26,00	25,00	25,00
	Sd	10,468	1,821	9,798	10,764	4,020	4,252
	Minimum	42	78	8	9	12	11
	Maximum	84	84	40	40	27	27
2	Mean	75,43	83,27	30,90	30,90	24,33	25,17
	Median	84,00	84,00	32,00	32,00	25,50	26,00
	Sd	16,297	1,760	6,488	6,666	3,209	2,984
	Minimum	27	78	18	18	15	15
	Maximum	84	84	39	39	27	27
3	Mean	84,00	84,00	23,00	24,09	20,27	19,55
	Median	84,00	84,00	24,00	25,00	22,00	22,00
	Sd	,000	,000	7,563	8,893	4,735	6,593
	Minimum	84	84	8	8	14	10
	Maximum	84	84	34	38	27	27
4	Mean	79,40	83,70	25,50	21,80	21,80	21,40
	Median	84,00	84,00	27,50	16,50	21,50	20,00
	Sd	14,546	,949	13,385	13,323	5,051	5,147
	Minimum	38	81	9	8	14	14
	Maximum	84	84	40	40	27	27

Kruskal-Wallis test results						
	Perceived Social Support Scale before.	**Perceived Social Support Scale after**	**AIS before**	**AIS after**	**Lawton scale before**	**Lawton scale after**
H Kruskal-Wallis	6,854	5,054	11,814	6,763	7,649	8,788
df	3	3	3	3	3	3
p	0,077	0,168	0,008	0,080	0,054	0,032

Table 6: Relationship between age and time to surgery and individual domains and scales before and after surgery.

Spearaman correlations			
		2. age (years)	**9. Time (in months) to surgery**
Somatic domain (0-100) before	rho	0,057	-0,296
	p	0,589	0,004
Psychological domain (0-100) before	rho	-0,138	-0,222
	p	0,186	0,033
Social domain (0-100) before	rho	-0,051	-0,103
	p	0,626	0,326
Environment domain (0-100) before	rho	-0,143	-0,228
	p	0,171	0,028
Somatic domain (0-100) after	rho	-0,034	-0,232
	p	0,745	0,025
Psychological domain (0-100) after	rho	0,021	-0,210
	p	0,839	0,044
Social domain (0-100) after	rho	-0,113	-0,115
	p	0,283	0,271
Environmental domain (0-100) after	rho	-0,101	-0,246
	p	0,334	0,017
Perceived Social Support Scale before	rho	0,241	-0,095
	p	0,021	0,372
Perceived Social Support Scale after	rho	0,289	0,138
	p	0,005	0,187
AIS before	rho	0,038	-0,010
	p	0,715	0,925
AIS after	rho	0,027	0,073
	p	0,800	0,487
Lawton scale before	rho	-0,072	-0,061
	p	0,494	0,564
Lawton scale after	rho	-0,190	-0,083
	p	0,068	0,429
Family Support Scale - before	rho	0,254	-0,165
	p	0,014	0,114
Scale of support Family - after	rho	0,317	0,018
	p	0,002	0,863
Scale of support Significant person - before	rho	0,115	-0,060
	p	0,271	0,566
Scale of support Significant person - after	rho	0,182	0,203
	p	0,080	0,051
Support Scale Friend - before	rho	0,187	-0,004
	p	0,076	0,968
Scale of support Friend - after	rho	0,178	0,227
	p	0,088	0,028

There was a statistically significant weak negative association between time to surgery and post- individual domains: Somatic Domain (0-100) before, Psychological Domain (0-100) before, Environmental Domain (0-100) before, Somatic Domain (0-100) after, Psychological Domain (0-100) after, Environmental Domain (0-100) after, and a positive association with the Friend Support Scale.

Discussion

Head cancer is considered one of the main types of cancer in Brazil and worldwide due to its significant incidence, prevalence and mortality. The World Health Organisation (WHO) estimates that there will be 27 million cases by 2030. Currently, HNC accounts for 5% of cancers in the Western world and affects 1.7% of the Brazilian population, encompassing a large and heterogeneous group of cancers [10].

The number of head cancers diagnosed has also increased in recent years in Australia. Although cancers occurring in the head and neck region represent a relatively small proportion of the overall cancer incidence (3.5 percent of all cancers), the prognosis of patients depends on prompt diagnosis and treatment. Advances in treatment have resulted in improved survival rates both in Australia and in other economically developed countries. As survival outcomes continue to improve, there is an increasing focus on survival and the impact of treatment on quality of life.

Health-related quality of life, as well as the impact of disease and its treatment on wellbeing, is the subject of many scientific publications and ongoing research.

The treatment process and subsequently the quality of life of patients is very significantly affected by delayed diagnosis, limited access to services and economic, emotional burdens [11].

Quality of life should be considered one of the most important factors during treatment, as it is a subjective state that is essentially influenced by the patient's expectations and social environment. To this end, validated research tools should be used to assess quality of life. Various aspects in quality-of-life questionnaires, patients' health problems and their occurrence during cancer treatment indicate the need for further support for patients [12].

Head cancers, but also their necessary and often successful treatment, can affect the general domains of health-related quality of life and cause various adverse symptoms and side effects, both during and after treatment [13].

Our study showed that the assessment of the quality of life of patients before and after surgery at different tumor stages (WHO I, II, III, IV) including the four domains presents statistically significant differences for all domains except the social domain before surgery.

The main aim of the study by Królikowska et al. was to assess quality of life after surgical treatment of brain tumors. The greatest reduction in quality of life immediately after surgery was observed in patients with low-grade glial tumors (WHO I, II) and extracerebral tumors (meningiomas and neuroblastomas). Thirty days after surgery, improvements in quality of life were observed in all included groups. The greatest improvement was observed in the group of patients operated on for meningioma and neuroblastoma, and the lowest in patients treated for metastatic tumors [2].

A study presented by Cruz et al. similarly to our own found that patients with early-stage disease had better quality of life after surgery than patients with late-stage tumors, highlighting the importance of early diagnosis [10]. A study presented by Królikowska et al. shows that the mean quality of life assessed with the EORTC QLQ-30 and EORTC QLQ-BN20 questionnaire from before surgery was 0.706, 5 days after surgery up to 0.614, and 30 days after surgery up to 0.707. In addition, 5 days after surgery, a significant reduction in the level of quality of life was observed, whereas after 30 days, quality of life significantly improved, reaching the level of quality of life before treatment [2].

In the study by Królikowska et al. a greater reduction in quality of life was observed in the group of patients with low-grade glial tumors (WHO I, II) and in the group of patients with extracerebral tumors such as meningiomas and neuroblastomas; the smallest, from the second side, was in the group of patients with high-grade tumors (WHO III, IV) and metastatic tumors. Thirty days after surgery, all groups showed increased quality of life. The best quality of life was observed in patients after meningioma and neuroblastoma surgery, and the lowest after metastatic tumor surgery. Primary brain tumors with a high degree of malignancy are aggressive tumors; they cause many symptoms, including neurological deficits, but also cognitive impairment, which can remain at a similar level after surgery [2].

Our study showed that the assessment of patients' quality of life before and after surgery including four domains shows statistically significant differences between pre- and post-surgery scores for the somatic domain and the psychological domain. In both domains, higher scores were noted in post-treatment measurements.

The study by Farrugia et al. presents domain-specific improvements in quality of life as determined by the ratio of post-treatment to baseline scores. The study provides evidence that improvements in HRQOL domains after treatment were associated with overall survival [14].

Our own research shows that the evaluation of patients' quality of life before and after surgery in different location of the cancer lesion including the four domains showed differences between groups for the somatic domain before and after treatment.

Other results were presented by Cruz et al. where it can be concluded that the quality of life of patients with head cancer was not influenced by tumor location [10]. In contrast, in a study by Zumre Arican Alicikus, Fadime et al. the location of the tumor and the method of treatment were the most important factors affecting the quality of life of head cancer patients [15].

In a study by Kelsey et al. the severity of pain in head cancer patients before treatment was associated with more advanced tumor stage and greater impairment in functional quality of life [11].

Future research should address quality of life in a holistic context and include individual, social and environmental factors that contribute to quality of life [11].

The quality of life of a patient with head cancer is an important aspect to consider when choosing therapy and following up with the patient, as it affects both the patient and the caregiver [16].

In a study by Wróbel et al. social support mainly from the immediate family perceived by the cancer patients studied positively affected the level of their quality of life. In the aspect studied, the main relationship was between the level of social support and the social functioning of patients [17].

Our own research shows that patient support before and after surgery using the support scale showed statistically significant differences between pre and post measurements. The values of each scale increased after surgery. There is a relationship between the age of the patient and the Social Support Scale, the older patients are, the more they expect and need support.

The in-house study showed that scores on the Perceived Social Support Scale, the AIS Scale and the Lawton Scale in relation to cancer stage showed statistically significant differences between groups on the AIS Scale before and Lawton Scale after surgery.

The self-reported study showed a statistically significant weak negative association between time to surgery and the individual domains and a positive association with the friend support scale.

The strengths of my study were the use of multiple standardized survey instruments to assess quality of life, independence, disease acceptance, social support, and the conduct of this study in patients with four stages of head cancer over a long period of time in hospital - more than one year. A limitation of my study, was the exclusion from the study group of patients with tumor stages III and IV after surgery, who refused to participate in further study, due to poor health and neurological deficits present.

Conclusions

Patients after neurosurgery for head tumors had a higher quality of life for the somatic and psychological domains, compared to patients before surgery, which may be related to improved general and psychological well-being after surgery.

Quality of life in cancer stage IV was higher before surgery in terms of somatic, psychological and environmental domains. In contrast, in stage I and II, quality of life is higher after surgery, considering all three domains. Patient support was higher after surgery from family and friends. The older the pa- patients are, the more they expect and need support from loved ones.

Quality of life was highest for the lesion located in the pituitary gland and frontal lobe, both before and after surgery. Quality of life was also high for meningioma, but only after surgery. The lowest quality of life was with a lesion located in the temporal lobe before and after surgery.

Patients were most accepting of their head cancer at stage II and least accepting at stage III. The greatest independence in patients and ability to perform daily activities was at stage II and stage I, and the least at stage III and stage IV, when the cancer was already more advanced and caused large neurological deficits.

Patients' quality of life, independence is dependent on the type of cancer, location and stage.

Summary

In the approach to the oncology patient, quality of life has become a parameter also important as other parameters characterizing the treatment process. Therefore, maintaining a good quality of life should be a priority for the head cancer patient.

A greater sense of support from family and friends in treated post-surgical patients has a very positive impact on wellbeing, acceptance of the illness, willingness to recover, activity during rehabilitation and contributes to patients' quality of life and independence.

Future research should deal with quality of life in a holistic context and include an individualized approach to solving the patient's health, social and environmental problems, which will contribute to improving their quality of life.

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