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Analysis of Quality of Life and Influencing Factors in Patients with Spinal Tumors

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Abstract

Objective: To explore the quality of life (QOL) of patients with spinal tumors and its influencing factors, so as to provide references for formulating targeted nursing interventions to improve their QOL. **Methods:** Eighty patients with spinal tumors admitted to our hospital from September 2022 to August 2023 were selected as the research subjects. All patients received surgical nursing care. Basic data of all patients were collected to identify the influencing factors of QOL in patients with spinal tumors, and logistic regression multivariate analysis was used for analysis. **Results:** The analysis showed that patients' age, gender, number of involved vertebral bodies, concomitant underlying diseases, and primary tumors had no significant impact on the QOL of patients with spinal tumors ($P > 0.05$). However, factors such as pain severity, walking ability, self-care ability, physical function, social function, emotional role, and mental health were univariate influencing factors for QOL in these patients ($P < 0.05$). Logistic regression multivariate analysis showed that pain severity, walking ability, self-care ability, physical function, social function, emotional role, and mental health were independent risk factors for QOL in patients with spinal tumors. **Conclusion:** Clinical nursing should focus on early identification of factors such as pain severity, walking ability, self-care ability, physical function, social function, emotional role, and mental health. During the nursing care of spinal tumors, the impact of these factors should be emphasized, and targeted nursing interventions should be carried out to improve patients' QOL.

Keywords

Spinal Tumor, Quality of Life, Influencing Factors, Univariate, Multivariate

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1. Introduction

Spinal tumors refer to primary tumors or metastatic tumors occurring in the spine. Spinal tumors can directly destroy the bone tissue of the vertebrae, leading to destruction of the spinal structure, causing pathological fractures, and may also compress important structures such as the spinal cord and nerve roots, leading to clinical manifestations such as pain, spinal deformity, neurofunctional disorders, and even paraplegia in severe cases. If not treated in a timely manner, it will seriously affect the quality of life and even threaten life. Spinal tumor is a rare but very important condition, and many symptoms can have a great impact on the quality of life of patients [1]. Therefore, clarifying the relationship between it and quality of life is the key to evaluating its prognosis and formulating a more reasonable treatment plan. Literature reports have shown that the quality of life of patients with spinal tumors is related to various factors [2]. These influencing factors include pain severity, walking ability, self-care, physical function, social function, emotional function, and psychological function [3]. The survival time of patients with malignant tumors is generally short, while the prognosis of patients with benign tumors is good. In addition, the size, invasion scope, and location of the tumor also have a certain impact on the quality of life of patients [4]. In recent years, with the improvement of medical and clinical nursing levels, the quality of life of patients with spinal tumors has been gradually improved. However, there is still a lack of comprehensive analysis of the relevant factors of patients' quality of life. Therefore, this paper intends to conduct a retrospective survey on multiple cases of spinal tumor patients, explore its mechanism of action on quality of life, and provide a theoretical basis for formulating personalized diagnosis and treatment plans. Therefore, this study will further explore the relevant influencing factors of quality of life in patients with spinal tumors, and propose corresponding treatment and nursing measures, which has a certain reference value for improving the quality of life of patients with spinal tumors. The details are as follows.

2. Materials and Methods

2.1. Data

Eighty patients with spinal tumors admitted to our hospital from September 2022 to August 2023 were selected, including 50 males and 30 females, aged 33 to 62 years, with an average age of (45.36 ± 3.52) years.

Inclusion criteria:

① Pathologically confirmed after surgery;

② Consistent with surgical indications and without surgical contraindications;

③ With complete medical history data.

Exclusion criteria:

① Patients with incomplete clinical basic data or non-cooperative with treatment;

② Patients with other concomitant malignant tumors;

③ Patients with severe systemic infections.

2.2. Methods

Basic data of all enrolled patients with spinal tumors were collected and sorted, mainly including factors such as age, gender, number of involved vertebral bodies, concomitant underlying diseases, primary tumors, pain severity, walking ability, self-care ability, physical function, social function, emotional role, and mental health. After integrating the data, logistic regression multivariate analysis was used to observe the main risk factors affecting the quality of life of patients with spinal tumors.

2.3. Statistical Methods

Data were processed using SPSS 24.0. Measurement data ($x \pm s$) were subjected to t-test, and counting data were represented by n (%) and subjected to chi-square (χ^2) test. $P < 0.05$ indicated significant differences between data. Logistic regression multivariate analysis was used to analyze the quality of life and influencing factors of patients with spinal tumors, with a two-sided test level $\alpha = 0.05$.

2.4. Ethical Statement

This study was approved by the Ethics Committee of Sun Yat-sen University Cancer Center, and all patients signed written informed consent forms.

3. Results

3.1. Baseline Demographic and Clinical Characteristics (See Table 1)

Table 1. Baseline demographic and clinical characteristics.

Characteristics	Category	Case number	Proportion (%)
Gender	Male	50	62.5
	Female	30	37.5
Age (years)	≤45	38	47.5
	>45	42	52.5
Number of involved vertebrae	Single vertebra	56	70.0
	Multiple vertebrae	24	30.0
Concomitant underlying diseases	None	45	56.3
	Yes	35	43.7
Primary tumor	Lung cancer	22	27.5
	Breast cancer	18	22.5
	Others	40	50.0

3.2. Univariate Analysis of Quality of Life in Patients with Spinal Tumors

Patients' age, gender, number of involved vertebral bodies, concomitant underly-

ing diseases, and primary tumors had no significant impact on the quality of life of patients with spinal tumors ($P > 0.05$). However, factors such as pain severity, walking ability, self-care ability, physical function, social function, emotional role, and mental health were univariate influencing factors for the quality of life of patients with spinal tumors ($P < 0.05$).

3.3. Logistic Regression Multivariate Analysis

Through logistic regression analysis, it was found that pain severity, walking ability, self-care ability, physical function, social function, emotional role, and mental health were independent risk factors for the quality of life of patients with spinal tumors ($P < 0.05$) (see Table 2).

Table 2. Multivariate logistic regression analysis.

Influence Factors	β	S. E	OR	95%CI	Wald χ^2	P
Pain Degree	2.035	0.821	5.565	1.254 - 52.956	8.521	0.004
Walking Ability	1.448	0.635	9.906	1.935 - 13.822	5.236	0.022
Self-Care Ability	1.524	0.698	5.845	1.023 - 15.785	4.825	0.016
Physiological Functions	1.658	0.665	4.415	3.136 - 45.788	15.264	0.002
Social Function	2.394	0.715	12.126	3.052 - 52.245	13.284	0.012
Role-Emotional	1.448	0.635	9.906	1.935 - 13.822	5.236	0.022
Mental Health	1.524	0.698	5.845	1.023 - 15.785	4.825	0.016

4 Discussion

4.1. Quality of Life in Patients with Spinal Tumors Is Influenced by Multiple Factors

Spinal tumors are malignant tumors occurring in the spinal bones or spinal cord. Spinal tumors are quite rare, accounting for approximately 1% - 2% of all cancers [5]. The National Cancer Center released the 2022 cancer report, showing that China has more than 5 million new cancer cases each year, among which 70% of malignant tumors develop bone metastases, and 70% of bone metastases are spinal metastases. Spinal tumors severely threaten patients' quality of life and prognosis. This study found that age, gender, number of involved vertebral bodies, concomitant underlying diseases, and primary tumors had no significant impact on quality of life, likely because their influence on quality of life is minimal. Logistic regression multivariate analysis showed that pain severity, walking ability, self-care ability, physical function, social function, emotional function, and psychological function in patients with spinal tumors were independent risk factors, indicating that the above factors all have a certain negative effect on patients' quality of life. Since the quality of life of patients with spinal tumors is determined by multiple factors, they should be considered in future research [6].

4.1.1. Pain Degree

Spinal tumors are often accompanied by severe pain, which not only seriously limits the patient's daily life but also has a far-reaching impact on their quality of life. Therefore, implementing effective pain control strategies is the core to improve the patient's quality of life. During the patient's hospitalization, medical staff should take a series of professional measures for comprehensive pain management. First, medical staff should conduct a comprehensive and detailed pain assessment for patients, using the Numerical Rating Scale (NRS), where 0 - 10 represents the degree of pain, 0 is no pain, and 10 is severe pain, and patients directly select the corresponding number. Evaluate the intensity, nature, location of pain, and the impact of pain on the patient's functional status. Targeted relief of patients' pain symptoms through various means such as drug therapy, physical therapy, and surgical intervention [7]. Drug therapy may involve non-steroidal anti-inflammatory drugs, opioids, adjuvant analgesics, etc.; physical therapy may include hot compress, cold compress, electrotherapy, massage, etc.; and surgical operations may involve tumor resection, nerve decompression, etc. After surgery or medication, medical staff should re-evaluate the patient's pain status in real time, adjust the treatment plan in a timely manner, explain the possible causes of persistent pain to the patient, and provide psychological support and emotional counseling to help them effectively cope with the psychological burden brought by the disease, thereby reducing pain and improving quality of life.

4.1.2. Ambulation Capacity

In patients with spinal tumors, walking ability is a key physiological function index, and its decline directly affects the patient's daily quality of life. During the patient's hospitalization, the medical team should conduct a comprehensive assessment of the patient's walking ability and muscle strength, including but not limited to muscle strength grade assessment and neurological function examination. Medical staff use the Walking Ability Scale (WAS) to score patients from four dimensions: walking distance, speed, use of assistive devices, and terrain adaptation [8]. For patients who have undergone spinal tumor surgery, during the postoperative recovery period, medical staff will formulate personalized rehabilitation plans according to the patient's specific conditions, which may include physical therapy, such as electrotherapy, thermotherapy, massage, targeted exercise training, such as gait training, muscle strength enhancement exercises, and the use of assistive devices, such as crutches, wheelchairs, walkers, etc., to help patients regain their walking ability.

4.1.3. Self-Care Ability

The quantitative assessment of the patient's self-care ability is the key basis for judging the independence of daily life and formulating rehabilitation plans and nursing plans. Clinically, medical staff use the Barthel Index (BI) to assess patients, covering 10 daily activities (such as eating, dressing, bathing, toileting, walking, etc.), with each item scored according to the degree of completion (0 -

10 points), and the total score is 100 points [9]. Grading criteria: 100 points: completely self-care; 61 - 99 points: mild dependence; 41 - 60 points: moderate dependence; ≤40 points: severe dependence. During the patient's hospitalization, medical staff should assess the patient's self-care ability. Based on the assessment results, medical staff will provide targeted nursing interventions. For surgically treated patients, rehabilitation training programs will be carried out, which may include but are not limited to daily living skills training, functional mobility training, and assistive technology education, aiming to help patients achieve greater autonomy in daily life through professional rehabilitation guidance and practice, thereby improving their overall quality of life.

4.1.4. Physiological Function, Social Function, Emotional Function, and Psychological Function

Physiological function, social function, emotional function, and psychological function collectively serve as critical determinants of quality of life in patients with spinal tumors. Due to tumor invasion, patients face severe challenges to their physiological integrity. Clinicians should implement precision medicine strategies tailored to individual patient profiles, integrating surgical interventions, radiotherapy, and chemotherapy to control tumor progression while restoring physiological function. Nursing staff must closely monitor vital signs, provide basic life support, and prevent potential complications to ensure physiological stability.

Impaired social interaction significantly hinders patients' ability to engage in work, family communication, and social activities. Emotional and psychological challenges often manifest as anxiety, depression, and mood instability. To address these, a multidisciplinary team (MDT) comprising physicians, nurses, family members, and caregivers should collaborate to develop targeted treatment plans aimed at enhancing physical function and social participation. Concurrently, professional psychological interventions and counseling are essential to strengthen emotional regulation and psychological well-being, thereby comprehensively improving patients' quality of life.

4.2. Summary

Current research primarily focuses on analyzing factors such as patient age, gender, primary tumor characteristics, pain intensity, number of involved vertebral bodies, physiological function, comorbidities, ambulatory capacity, self-care ability, social function, emotional role, and mental health. These studies provide valuable clinical guidance for developing targeted nursing models to improve patient prognosis and quality of life. However, further research and validation are needed to clarify how these factors specifically influence long-term quality of life outcomes [10].

In summary, multiple factors collectively determine the quality of life and survival time of spinal tumor patients. While age, gender, number of involved vertebral bodies, comorbidities, and primary tumor characteristics show no significant impact on quality of life, pain intensity, ambulatory capacity, self-care ability,

physiological function, social function, and psychological status exhibit a significant negative correlation with survival time. Therefore, these factors must be comprehensively considered during surgical treatment planning to optimize patient outcomes.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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