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Outcomes are clinical and surgical of brain tumors in Iraqi patients

Mohammed Rashad Ismael Al-Jawaheri[1], Ammar Saeed Rashid[2], Saadoun Mohsin Saadoun[3], Salim Mardan Omer[4] , Ali Qais Abdulkafi[5]

[1] Specialists Neurosurgery, Iraqi Ministry of Health, Baghdad, Iraq, and Lecturer of Neurosurgery, Ministry of Higher Education and Scientific Research, Al-Iraqia University, Medical College, Baghdad, Iraq

[2] Kufa University College of Medicine, Najaf, Iraq.

[3] Iraqi Ministry of Health, Baghdad Al-Rusafa Health Directorate, Dr. Saad AL-Witry Hospital for Neurosciences, Baghdad, Iraq

[4] Ministry of Higher Education and Scientific Research, Kirkuk University \ College of Medicine, Kirkuk, Iraq

[5] Iraqi Ministry of Health, Kirkuk Health Department, Kirkuk Teaching Hospital, Kirkuk, Iraq

Abstract

Background: The survival rates of patients with brain tumours have significantly improved over the last few decades.

Objective: This paper aims to study the clinical and surgical findings in Iraqi patients with brain tumours.

Patients and methods: A cross-sectional study was undertaken on the medical records of brain tumour patients admitted for treatment at hospitals in different in Iraq between 17th March 2022 and 20th January 2023. Our clinical methodology was designed to capture the demographic characteristics of 84 patients with brain tumours. General anaesthesia was administered to patients undergoing brain tumour surgery. The methodology was constructed by analysing the collected data with the aid of SPSS.22.0 and Excel 2016. The basic characteristics were identified through the utilization of calculated percentages and frequencies alongside mean ± SD to present the univariate analysis.

Results and discussion: Based on clinical demographics, our investigation reveals that the number of male patients' cases was more significant, with 54 (64.29%) cases in comparison to 30 (35.71%) cases in females. Furthermore, the research revealed a rise in the proportion of patients with non-glioma at 48 (57.14%) in comparison with gliomas at 36 (42.86%). Our study determined infection as the highest contributing factor at 10 (11.9%), while neurological deficits were the lowest factor at 3 (3.57%). As a result, our analysis revealed a median survival time of 12.12 months and a survival rate of 49.7%.

Conclusion: our study revealed that glioma treatment can significantly impact the survival rates of patients diagnosed with brain tumors. It was observed that patients' survival rates varied depending on the type of treatment they received.

Key Words: brian tumors, gliomas, non-glioma, infratentorial, supratentorial

Address for correspondence:
Mohammed Rashad Ismael Al-Jawaheri, Specialists Neurosurgery, Neurosurgeon Iraqi Ministry of Health, Baghdad, Iraq, Lecturer of Neurosurgery, Ministry of Higher Education and Scientific Research, Al-Iraqia University, Medical College, Baghdad, Iraq. E-mail: kirkuk.research@gmail.com

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INTRODUCTION

Brain tumours are characterised by the abnormal growth of cells in the brain [1]. Such tumours can either arise within the brain itself (primary brain tumours) or spread to the brain from elsewhere (secondary or metastatic brain tumours) [2]. Brain tumours can be either benign (non-cancerous) or malignant (cancerous).

Malignant brain tumours are generally more aggressive and grow at a faster pace. Several types of brain tumours exist, including gliomas, meningiomas, pituitary adenomas, and medulloblastomas, among others [3, 4]. Each type of tumour differs based on its location, rate of growth, and the treatment options that are available [5].

Outcomes for patients with brain tumours may vary according to numerous factors, including the type and site of the tumour, the timing of diagnosis, the patient's overall health, and the availability of treatment

options. It is important to consider all these factors when assessing the prognosis and planning treatment [6-8].

Additionally, surgical intervention typically serves as the initial step for the diagnosis and treatment of brain tumours. This process encompasses the complete extraction of the tumour or the acquisition of a biopsy to obtain a sample for further analysis [9].

In some instances, complete eradication of the tumour through surgical means is attainable and recommended. This is referred to as tumour resection and should always be the priority where possible, as it has the potential to enhance patient outcomes and perhaps deliver a cure [10].

Moreover, when complete excision is unfeasible owing to either the tumor's position or size, debulking - a surgical method for reducing the overall size of the tumor - may be utilized. Moreover, when complete excision is unfeasible owing to either the tumor's position or size, debulking - a surgical method for reducing the overall size of the tumor - may be utilized. This approach minimizes symptoms and promotes the effectiveness of other forms of therapy [11,12].

Furthermore, surgical procedures can grant access for supplementary treatments, like radiation or chemotherapy. Post-surgery, patients might receive additional treatments intended to eliminate residual tumour cells or to prevent reoccurrence [13].

Surgery can still help ease symptoms resulting from the tumor exerting pressure on the brain. Surgery can alleviate symptoms such as headaches, seizures, and neurological deficits by reducing the tumor mass [14, 15].

MATERIAL AND METHOD

Setting design

A cross-sectional study was undertaken on the medical records of brain tumour patients admitted for treatment at hospitals in different in Iraq between 17th March 2022 and 20th January 2023. Our clinical methodology was designed to capture the demographic characteristics of 84 patients with brain tumours. General anaesthesia was administered to patients undergoing brain tumour surgery. The choice of anaesthetic for brain tumour surgery is dependent on various factors such as tumour size and location, patient health and preferences, and the selected surgical approach. In most instances, general anaesthesia is implemented during brain tumour surgery. The practice of general anaesthesia entails the administration of certain medications that act upon the Central Nervous System (CNS) to yield the intended effects. These drugs usually comprise intravenous treatments, inhaled anaesthetics, and at times muscle relaxants. Clinical and demographic outcomes encompassed patients between ages 40-60 with a BMI of 18.5 to 30 for both genders. Medical records of brain tumour patients were evaluated for the education level - primary, secondary, and college. Data outcomes were recorded relating to tumour location, the onset of the disease, tumour site, and tumour type. To further the results methodology, we enrolled outcomes and factors that were associated with the overall survival in the univariate analysis.

Statistical analysis

The methodology was constructed by analysing the collected data with the aid of SPSS.22.0 and Excel 2016. The basic characteristics were identified through the utilization of calculated percentages and frequencies alongside mean ± SD to present the univariate analysis. Our clinical outcomes were evaluated by monitoring the hospital stay of brain tumour patients following their surgery over the period of thirty consecutive days. Moreover, we generated outcome data by plotting the overall survival curve over time for a patient with hemorrhagic brain metastasis.

RESULTS

Tab. 1. Clinical demographic characteristics outcomes of brain tumors patients

Clinical parameters	Number of patients (84)	Percentage (%)
Age		
40-44	12	14.29%
45-49	16	19.05%
50-54	26	30.95%

55-60	30	35.71%
Gender		
Males	54	64.29%
Females	30	35.71%
BMI		
< 18.5	11	13.10%
18.5-24.9	13	15.48%
25-29.9	28	33.33%
Above 30.0	32	38.10%
Comorbidities		
Hypertension	36	42.86%
Diabetes	16	19.05%
Cardiovascular diseases	12	14.29%
Chronic respiratory diseases	9	10.71%
Chronic kidney disease	11	13.10%
Symptoms		
Persistent headaches	18	21.43%
Seizures	4	4.76%
Memory problems	8	9.52%
Difficulty with balance	5	5.95%
Mood or personality changes	11	13.10%
Nausea	13	15.48%
Vomiting	10	11.90%
changes in sleep patterns	15	17.86%
Education Level		
Primary School	14	16.67%
Secondary School	30	35.71%
College	40	47.62%

Based on clinical demographics, our study found that male patients had a higher number of cases, with 54 (64.29%) compared to females at 30 (35.71%) (Table 1). Additionally, the study recorded an increase in patient cases between the ages of 50 and 60 years old, with patients between 50-55 years old having 26 (30.95%) cases and those between 55-60 years old having 30 (35.71%) cases. Furthermore, Comorbidities results found an increase in patients' cases of hypertension with 36 (42.86%) (Figure 1).

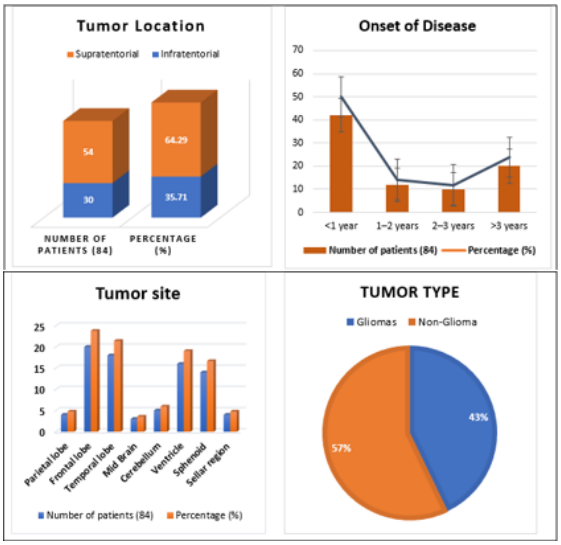

Fig. 1. Distributions of brain tumors patients according to Tumor location, Onset of Disease, Tumor site, and Tumor Type

Our research reveals a disease onset incidence rate of 50% within one year for patients. Furthermore, the clinical outcomes display a correlation with tumor location, with the majority (64.29%) of patients having a supratentorial location while the rest (35.71%) have an infratentorial location. Additionally, our findings showed that the frontal lobe region had the highest percentage of patients, with 23.81%. Moreover, our study found an increase in the rate of patients with non-glioma at 48 (57.14%) compared to gliomas at 36 (42.86%) (Table 2, Figure 2).

Tab. 2. Outcomes of post-operative complications

Post-operative complications	Number of patients	Percentage (%)
Infection	10	11.90%
Blood clots	7	8.33%
Swelling	6	7.14%
Hemorrhage	4	4.76%
Neurological deficits	3	3.57%
Total	30	35.71%

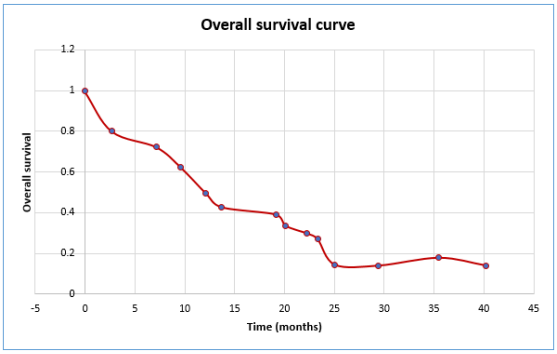

Fig. 2. Plotting the overall survival curve over time for a patient with hemorrhagic brain metastasis

In this (Figure 3), our outcomes were found that the median of survival time was 12.12 months, and the survival rate was 49.7%.

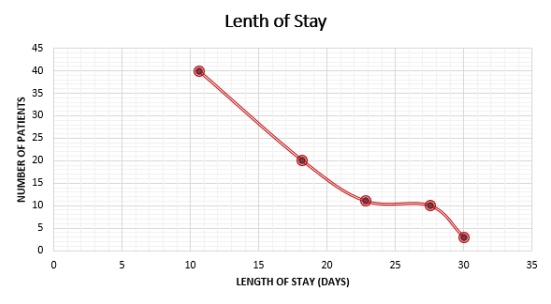

Fig. 3. Determining hospital stay for brain tumour patients after surgery

Our study determined the length of hospital stay rate for tumour patients. Half of the patients stayed for ten days, while a lower percentage of patients stayed for 30 days, with only 3 cases (Table 3).

Tab. 3. Factors associated with overall survival in the univariate analysis

Variables	Univariate analysis (P-value)	Hazard ratio (95% CI)
Age	0.0324	0.8388 (0.754-0.961)
Sex		
Males	0.0264	0.7552 (0.63-0.874)
Females	0.0273	0.642 (0.513-0.791)
Comorbidities		
Hypertension	0.615	0.465 (0.322-0.571)
Diabetes	0.611	0.457 (0.0358-0.522)
BMI		
Less than 30.0	0.263	1.025 (0.972-1.0754)
Above 30.0	0.683	2.53 (1.54-3.33)
Tumor Type		
Non-Glioma	0.293	2.066 (1.042-6.553)
Gliomas	0.0316	2.871 (1.036-4.468)
Tumor Location		
Infratentorial	0.426	5.539 (4.031-7.772)
Supratentorial	0.483	5.512 (5.182-8.826)
Tumor site		
Parietal lobe	0.322	0.630 (0.712-5.566)
Frontal lobe	0.312	1.763 (0.568-5.688)
Complications		
Infection	0.292	2.053 (0.521-7.821)
Blood clots	0.23	0.972 (0.935-1.018)
Swelling	0.001	13.013 (2.437-40.248)

DISCUSSION

Our study aimed to investigate the clinical and surgical outcomes of brain tumours in Iraqi patients. We diagnosed the clinical and demographic outcomes of 84 cases of brain tumour patients aged between 40 and 60 years with a BMI ranging from 18.5 to 30.

As brain tumours progress, they can cause considerable disability and mortality for patients. Such complications may necessitate procedures like surgery and can directly affect the tumour. Recent advancements in diagnostic and treatment methods have resulted in a significant increase in the survival rate for individuals with brain tumours over the last few years [16]. According to recent studies, the survival rates of patients with non-malignant brain tumours have increased to between 90% and 95% over the last five years. However, it should be noted that these results cannot be attributed solely to tumour treatments [17].

Based on clinical demographics, our investigation reveals that the number of male patients' cases was more significant, with 54 (64.29%) cases in comparison to 30 (35.71%) cases in females. We observed a rise in patient cases in the age range of 50-60 years old, with 26 (30.95%) cases in patients between 50-55 years old and 30 (35.71%) cases in those ranging from 55-60 years old. Additionally, the investigation found an increase in hypertension cases in patients, with 36 (42.86%) cases presenting comorbidities.

Recent studies have shown that there is no significant difference in the treatment of brain tumour patients of various ages. Clinical outcomes differ between elderly patients and adults, where older patients with brain tumours may face more disadvantages during surgeries or chemotherapy treatments [18]. Additionally, elderly patients with brain tumours have a significant risk factor that can result in higher mortality rates compared to patients less than 40 years old [19].

Brain tumours were categorised into two types - gliomas and non-gliomas - based on

tissue origin. Gliomas accounted for 40-60% of all brain tumours [20]. In our study, the percentage of patients with gliomas was 43%, while those with non-gliomas were 57%.

To further of outcomes, although recent literatures were found, most of patients with infratentorial had a higher negative impact than supratentorial. However, there are no difference in patients who survive in comparison with supratentorial tumors patients. Furthermore, Cerebellar syndrome demonstrated a significantly higher prevalence in infratentorial subjects compared to supratentorial patients [21]. Due to that, our study indicates a 50% incidence rate of disease onset within one year for patients. Moreover, a correlation between tumor location and clinical outcomes was observed. Most patients (64.29%) had a supratentorial location, while the remaining 35.71% had an infratentorial location. It was also found that the frontal lobe region had the highest percentage of patients, with 23.81%. Furthermore, the research revealed a rise in the proportion of patients with non-glioma at 48 (57.14%) in comparison with gliomas at 36 (42.86%).

Additionally, we conducted a distribution of complications among patients who had undergone brain tumor surgery and found that infection was the most significant factor influencing patients with brain tumors after surgery. Our study determined infection as the highest contributing factor at 10 (11.9%), while neurological deficits were the lowest factor at 3 (3.57%). As a result, our analysis revealed a median survival time of 12.12 months and a survival rate of 49.7%.

CONCLUSION

The study's findings suggest a significant correlation between age and mortality rate with a p-value greater than 0.05, resulting in prolonged hospital stays for elderly patients.

In our research, we conducted a univariate analysis of factors influencing overall survival, highlighting tumor type as the most significant risk factor, with Glioma presenting a hazard ratio of 2.871 (1.036-4.468). In summary, our study revealed that glioma treatment can significantly impact the survival rates of patients diagnosed with brain tumors. It was observed that patients' survival rates varied depending on the type of treatment they received.

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