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The Clinical Status of Meningothelial Meningioma Patients

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Abstract

Background: Understanding the clinical status of patients with meningothelial meningioma is crucial for accurate prognosis, treatment planning, and monitoring disease progression. Numerous factors, including tumor characteristics, patient demographics, and histopathological features, contribute to the clinical status and overall management of these patients**.** ***Objective:*** To assess the clinical status of meningothelial meningioma patients**.** ***Method:*** This descriptive cross-sectional study was carried out at the Department of Pathology, Dhaka Medical College over a period of two years from January 2018 to December 2019. A total of 60 Patient of any age group with histologically diagnosed meningiomas of the central nervous system were included as a sample population. During the collection of specimen, all relevant information were recorded systematically in a prepared proforma. All the cases were numbered chronologically and the same number was given to H&E as well as in immunohistochemically stained slides. ***Results:*** During the study, majority were belong to 51-60 years and 61-70 years age group, 26.7% and majority were female, 70%. It revealed that maximum lesions (86.7%) were at brain and 13.3% were at the spinal cord. It was observed that meningioma was widely distributed throughout the CNS. Majority of the lesions were at the parietal region (28.3%). 18.3% lesions were at frontal region. Plus, according to the tumor grade, It was observed that more than three fourth (80.5%) patients had grade I tumor, 17.8 % patients had grade II tumor and 1.7 % patients had grade III tumor. Moreover, that 55% cases were meningothelial meningioma and 8 (13.3%) patients had atypical meningioma**.** ***Conclusion:*** In our study, maximum patients had lesions were at brain which was widely distributed throughout the CNS. Plus, more than three fourth patients had grade I tumor where meningothelial meningioma was most common.

Keywords: Progesterone, meningothelial meningioma, tumor.

INTRODUCTION

Meningothelial meningiomas are the most common subtype of intracranial tumors arising from the meninges, the protective membranes enveloping the brain and spinal cord. These tumors predominantly occur in adults and are characterized by slow growth and typically benign behavior. However, the clinical status of patients diagnosed with meningothelial meningioma can vary widely, with some cases displaying aggressive features and a potential for recurrence [1-3].

Understanding the clinical status of patients with meningothelial meningioma is crucial for accurate prognosis, treatment planning, and monitoring disease progression. Numerous factors, including tumor characteristics, patient demographics, and histopathological features, contribute to the clinical status and overall management of these patients [4-7].

Histologically, meningothelial meningiomas are composed of uniform cells with round-to-oval nuclei and eosinophilic cytoplasm arranged in lobular or sheet-like structures. The World Health Organization (WHO) classifies meningiomas into several subtypes based on histological features and malignant potential.

Meningothelial meningiomas are generally considered WHO Grade I, indicating a low potential for aggressive behavior. However, a subset of meningothelial meningiomas may exhibit atypical or malignant features, indicating a higher risk of recurrence and potential for aggressive clinical course [8-9].

In addition to histopathology, the clinical status of meningothelial meningioma patients is influenced by various factors. Patient age, gender, and comorbidities can impact the overall prognosis and treatment options. Location and size of the tumor are critical determinants of symptomatology, neurological deficits, and surgical resectability. Certain anatomical locations, such as the skull base or critical neurovascular structures, pose unique challenges and may require multidisciplinary approaches for optimal management.

Clinical manifestations of meningothelial meningiomas can vary widely, depending on the tumor's location and size. Common symptoms include headaches, seizures, focal neurological deficits, visual disturbances, and cognitive impairments. The severity and progression of symptoms, as well as the presence of associated complications, can greatly influence the clinical status and quality of life of meningothelial meningioma patients [10].

Given the potential for recurrence and variable clinical outcomes, regular monitoring and long-term follow-up are essential in managing meningothelial meningioma patients [11]. Radiological imaging techniques, such as magnetic resonance imaging (MRI) and computed tomography (CT), play a crucial role in assessing tumor growth, recurrence, and treatment response. Additionally, histopathological evaluation of recurrent tumors may provide insights into the malignant transformation of initially benign meningothelial meningiomas [12].

This study aims to summarize the current understanding of the clinical status of patients diagnosed with meningothelial meningioma. By examining the diverse factors influencing prognosis and treatment outcomes, including tumor characteristics, patient demographics, and histopathological features, we aim to provide a holistic view of the clinical spectrum associated with this subtype of meningioma. Such knowledge will contribute to improved patient care, enhanced prognostic accuracy, and the development of personalized treatment strategies for meningothelial meningioma patients.

OBJECTIVE

To asses the Clinical Status of Meningothelial Meningioma Patients.

METHOD

This descriptive cross-sectional study was carried out at the Department of Pathology, Dhaka Medical College over a period of two years from January 2018 to December 2019. A total of 60 Patient of any age group with histologically diagnosed meningiomas of the central nervous system were included as a sample population. During the collection of specimen, all relevant information were recorded systematically in a prepared proforma. All the cases were numbered chronologically and the same number was given to H&E as well as in immunohistochemically stained slides.

Evaluation of immunostaining and scoring was performed by light microscopy. All slides were examined for positively stained tumor cell nuclei regardless of tumor grade. Distinct brown-stained nuclei were recorded as positive. PR receptor expression was evaluated on the basis of extent and intensity of immunolabelled tumor cells. The receptor status was determined by immunoreactivity scoring scale (IRS).

After meticulous checking and rechecking all data were recorded in a predesigned data collection sheet. Continuous variables were expressed as mean ± SD and were compared between groups of patients by student's 't' test. Categorical variables were compared using a chi-square test or Fischer's exact test as appropriate, and were presented as absolute frequencies with percentages. All P values were two-tailed with significance defined as $p<0.05$ at the level of 95% confidence interval (CI). All analysis was done using the SPSS 22.0 (Statistical Package for Social Science) package for windows.

RESULTS

Table-1 shows demographic status of the patients where majority were belong to 51-60 years and 61-70 years age group, 26.7% and majority were female, 70%.

Table-1: Demographic status of the patients

Age distribution, years	Percentage (%)
<10	**1.7**
10-20	**3.3**
21-30	**11.7**
31-40	**15**
41-50	**26.7**
51-60	**26.7**
61-70	**10**
>70	**5**
Gender	**%**
Male	**30**
Female	**70**

Figure-1 shows distribution of study patients according to location. It revealed that maximum lesions (86.7%) were at brain and 13.3% were at the spinal cord.

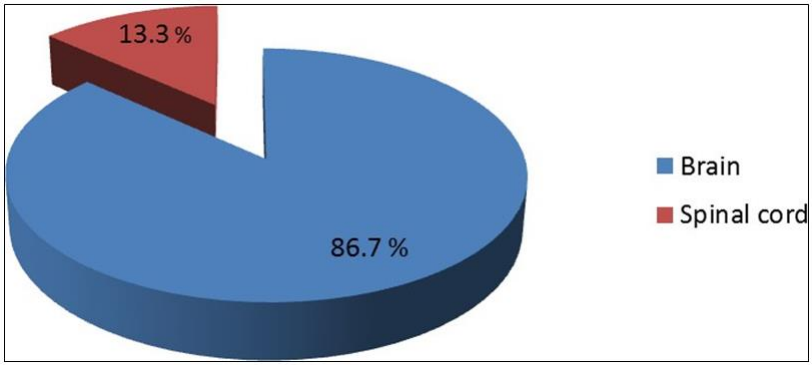

Figure-1: Distribution of the study patients according to lesion arises in the CNS and the spinal cord (n=60)

Table-2 shows the site of distribution of meningioma of study patients. It was observed that meningioma was widely distributed throughout the CNS. Majority of the lesions were at the parietal region (28.3%). 18.3% lesions were at frontal region.

Table-2: Distribution of the study patients according to site of lesion (n=60):

Site of lesion	Frequency		Percent
Brain	Parietal	17	28.3
	CP angle	2	3.3
	Frontal	11	18.3
	Falcine	2	3.3
	Temporal	3	5.0
	Tentorial	1	1.7
	Sphenoid wing	2	3.3
	Cerebellar	1	1.7
	Sellar region	6	10.0
	Falx cerebri	1	1.7
	Orbital plate	1	1.7
	Cribriform plate	3	5.0
	Olfactory groove	1	1.7
Spinal Region	Petro-clival	1	1.7
	Spinal	8	13.3
	Total	**60**	**100.0**

Figure-2 shows distribution of the patients according to the tumor grade. It was observed that more than three fourth (80.5%) patients had grade I tumor, 17.8 % patients had grade II tumor and 1.7 % patients had grade III tumor.

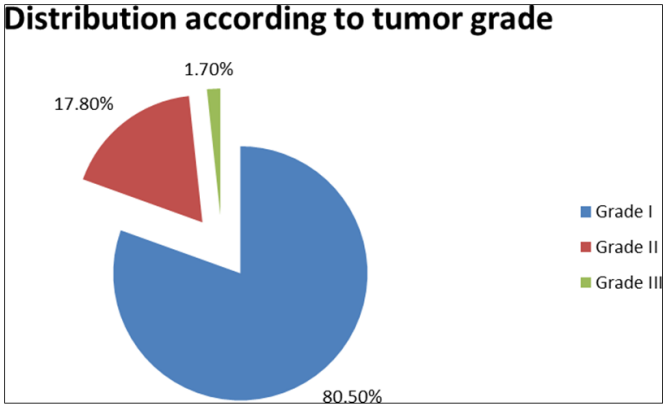

Figure-2: Distribution of the study patients according to tumor grade (n=60)

Table-3 mentions the distribution of the histomorphologic types of the study patients. It was observed that 55% cases were meningothelial meningioma, 8 (13.3%) patients had atypical meningioma, 5 (8.3%) patients had transitional meningioma, 4 (6.7%) patients had psammomatous meningioma and 1(1.7%) cases had anaplastic meningioma.

Table-3: Distribution of the study patients according to histomorphologic type (n=60)

Histologic subtype	Frequency	Percentage (%)
Meningothelial	33	55.0
Fibrous	2	3.3
Transitional	5	8.3
Psammomatous	4	6.7
Angiomatous	2	3.3
Secretory	1	1.7
Lymphoplasmacyte-rich	1	1.7
Atypical	8	13.3
Chordoid	2	3.3
Clear cell type	1	1.7
Anaplastic	1	1.7
Total		**100.0**

DISCUSSION

The clinical status of patients with meningothelial meningioma is a complex and multifaceted aspect that encompasses various factors impacting prognosis, treatment outcomes, and overall patient well-being. To gain a deeper understanding of the clinical status of these patients, several studies have investigated different aspects related to tumor characteristics, patient demographics, and treatment modalities. In this discussion, we will explore the findings of relevant studies and their implications for the clinical status of meningothelial meningioma patients.

In the current study age range was 3 to 75 years and the mean age of the was 46.78 (±15.56) years. Most cases were at 4th and 5th decade which was 26.7% of the total cases. The result is similar to the other study. [9] They found the mean age of the patient was 42.29 (±15.96) years and age was 6 months to 67 years. Other study found most of the patients with meningioma were above the age of 40 years. 11 Another study showed that mean age of the patient was 54 years [12].

The male female ration of the current study was 1: 2.23. In Germany, one study did a similar study having 588 patients. They found the male female ratio was 1: 2.06 which is comparable to the current study [12].

According to WHO grading system meningioma is divided into three different grades. They are grade I, grade II and grade III. Histopathological grading is useful for diagnosis, treatment and prognosis. The current study revealed 76.7% grade I, 17.8% grade II and 1.7% grade III meningiomas. Study done by Cetin et al. (2019) showed that the frequency of grade I, grade II and grade III meningiomas was 78.7%, 20% and 1.3%. One study showed that the frequency was 68%, 22% and 10% in grade I, II and II respectively which is comparable to the current study. 12 Different studies showed that grade I was the most common grade of meningioma. They ranged from 84-92.6%. Grade II meningioma was 6.3-17% and grade III was 1.11-5.68% [12-15].

Numerous studies have focused on identifying tumor characteristics that may influence the clinical status of meningothelial meningioma patients. One such study analyzed a large cohort of meningioma patients and found that tumor grade, as determined by the WHO classification, significantly impacted overall survival and progression-free survival rates. Patients with higher-grade meningiomas exhibited poorer clinical outcomes, emphasizing the importance of accurate histopathological grading for prognostic assessment [16].

In addition to tumor grade, the size and location of meningothelial meningiomas have been shown to influence clinical status. Several studies have demonstrated that larger tumor size is associated with increased neurological deficits and a higher likelihood of recurrence [13]. Furthermore, meningothelial meningiomas located in critical neurovascular areas or skull base regions often pose greater challenges in terms of surgical resectability, leading to a more complex clinical management approach [14].

Patient demographics, including age and gender, have also been investigated in relation to the clinical status of meningothelial meningioma patients. One study by Ostrom *et al.*, (2015) explored the impact of age on survival outcomes and reported that older age at diagnosis was associated with worse overall survival [15]. The study highlighted the need for tailored treatment approaches considering the age-related factors influencing clinical status.

Moreover, hormonal factors have garnered attention due to the potential influence of sex hormones on meningothelial meningioma growth and progression. Several studies have investigated the expression of hormone receptors, such as estrogen receptor (ER) and progesterone receptor (PR), in meningothelial meningiomas. A study found that ER and PR positivity was associated with improved progression-free survival, suggesting a potential role for hormonal therapies in selected cases.

The clinical status of meningothelial meningioma patients is a complex interplay between tumor characteristics, patient demographics, and treatment modalities. While histopathological grading, tumor size, and location provide insights into prognosis, age, and hormonal factors contribute to clinical outcomes. Surgical resection remains the mainstay of treatment, and the extent of resection is closely tied to clinical success. Adjuvant therapies such as radiation may further improve outcomes, but long-term effects should be considered. It is crucial for future studies to continue investigating these factors to refine risk stratification, develop personalized treatment algorithms, and improve the clinical status and overall well-being of meningothelial meningioma patients [16-18].

CONCLUSION

In our study, maximum patients had lesions were at brain which was widely distributed throughout the CNS. Plus, more than three fourth patients had grade I tumor where meningothelial meningioma was most common.

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