



## Demographic, Clinical, And Tumor Profile Of Meningioma In Mohammad Hoesin Hospital Palembang, Indonesia

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### ARTICLE INFO

#### Keywords:

Meningioma  
Demographic  
Clinical profile  
Tumor profile

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All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.32539/BJI.v8i1.122>

### ABSTRACT

**Introduction.** Meningioma was the most frequently reported primary intracranial tumor. There had been few reports about meningioma profile in Indonesia. The objective of this study was to identify the profile of meningioma based on demographic, clinical, and tumor characteristics. **Methods.** This was a cross-sectional study using secondary data from medical records. There were 67 meningioma patients based on histopathological examination at Mohammad Hoesin Hospital from January to December 2018. Demographic profile, history of hormonal contraceptive use, neurologic symptoms, and tumor characteristics were obtained. **Results.** During 2018, the incidence of meningioma was 68,3% of all primary CNS tumors. Meningioma was mostly found in the age group 35-44 years (44.8%). Most of the patients was female (92.5%), and 29 patients (46.8%) had a history of hormonal contraceptive use. Headache was the most frequent clinical manifestation in meningioma patient (34.3%). Based on the location, convexity meningioma was the most frequently found (65.7%). No patient reported a history of ionizing radiation exposure. There was only one patient (1.5%) with a family history of malignancy (breast tumor). Based on histopathological examination, 60 patients (89.6%) were reported as WHO grade I, mostly of the meningothelial subtype (40%). The outcome was generally good in most patients (88.1%). **Conclusion.** In our institution, meningioma was the most commonly found primary brain tumor. Headache was the most common clinical manifestation, and these tumors were mostly located in convexity of the brain, with the majority being WHO grade I and meningothelial subtype.

### 1. Introduction

Meningioma is a benign meningeal tumor that arises from cells associated with arachnoid villi.<sup>1,2</sup> Meningiomas are the most common primary central nervous system (CNS) tumors, accounting for 15-20%.<sup>3</sup> Data from the Central Brain Tumor Registry of the United States (CBTRUS) in 2011-2015 revealed that meningiomas was the most frequently reported CNS tumor (37.1% of all CNS tumors).<sup>4</sup> Meanwhile, in Indonesia, there were only few data reported of meningioma each year.

### 2. Methods

This was a cross-sectional study using secondary data from medical record of Meningioma patients from January to December 2018.

The inclusion criteria were patients aged  $\geq 18$  years old and diagnosed with meningioma based on histopathological confirmed. Variables studied were age, sex, history of hormonal contraceptive use, history of radiation exposure, family history of

malignancy, clinical manifestation. Information of the tumor was obtained from the patient's chart (histopathology of the tumor) and from characteristics of neuroradiological finding (magnetic resonance imaging or computed tomography).

Statistical analysis was performed using SPSS 22.0 for Windows. Data were statistically evaluated using univariate analysis.

This study was approved by Health Research Review Committee of Mohammad Hoesin Central Hospital and Faculty of Medicine, Sriwijaya University (No. 210/kepkrsmhfksri/2019).

### 3. Results

There were 69 cases of meningiomas in 2018 and it accounted for 68,3% of all primary CNS tumors. Of those 69 cases, only 67 medical records were collected.

Most patients with meningioma were found in the age group 35-44 years (44.8%) with an average age of  $45.22 \pm 8.139$  years. Meningioma was predominantly

found in women (92.5%). Of the 62 female meningioma patients, only 33 reported the use of hormonal contraceptive and most of the patients used injectable hormonal contraceptive (93%). There was only one patient with a family history of malignancy (breast cancer). The most common clinical manifestation was headache (34.3%). Based on the treatment outcomes, the majority of patients (88.1%) were discharged alive from the hospital, and only a small proportion died (11.9%). The demographics and clinical characteristics of patient are shown in Table 1.

Based on its location, convexity meningioma was

the most frequently found (65.7%), while the rest were found only in small amounts, including sphenoid (11.9%), intraorbital (11.9%), spinal (4.5%), parasagittal (3.0%), suprasellar (1.5%) and posterior fossa (1.5%) meningiomas.

Histopathologically, the WHO grade I meningioma was seen in 60 patients (89.6%), 4 patients (6.0%) had grade II, and 3 patients had grade III meningioma (4.5%). According to the histopathological subtype, in patients with WHO grade I meningioma, the most common subtype was meningothelial (45%); WHO grade II was atypical (75%); and WHO grade III was anaplastic subtype (66%).

**Table 1. Demographic and clinical characteristics of meningioma patients**

<b>Variable</b>	<b>No. of cases</b>	<b>Percentages</b>
<b>Age</b>		
18-34	4	6.0
35-44	30	44.8
45-54	24	35.8
55-64	9	13.4
<b>Sex</b>		
Male	5	7.5
Female	62	92.5
<b>Risk Factors</b>		
<b>History of hormonal contraceptive use</b>		
Yes	29	46.8
No	4	6.4
Missing data	29	46.8
<b>History of radiation exposure</b>		
Yes	0	0
No	26	38.8
Missing data	41	61.2
<b>Family history of malignancy</b>		
Yes	1	1.5
No	37	55.2
Missing data	29	43.3
<b>Clinical Manifestations</b>		
Seizure	3	4.4
Headache	23	34.3
Loss of consciousness	10	14.9
Proptosis	13	19.4
Visual disturbance	6	9
Weakness	6	9
Forehead lump	6	9
<b>Outcome</b>		
Alive	59	88.1
Died	8	11.9

**Table 2. Tumor characteristics of meningioma patients**

Variable	No. of cases	Percentages
<b>Location</b>		
Convexity	44	65.7
Parasagittal/falx	2	3.0
Sphenoid	8	11.9
Suprasellar	1	1.5
Intraorbital	8	11.9
Spinal	3	4.5
Posterior fossa	1	1.5
<b>Histopathology</b>		
<b>Grade I</b>		
Meningothelial	60	89.5
Fibrous	27	45
Transitional	3	5
Angiomatous	9	15
Metaplastic	1	1.7
Enplaque	5	8.3
	15	25
<b>Grade II</b>		
Atypical	4	6.0
Chordoid	3	7.5
	1	2.5
<b>Grade III</b>		
Rhabdoid	3	4.5
Anaplastic	1	33.3
	2	66.7

#### 4. Discussion

In this study, most meningioma patients were in the age group of 35-44 and 45-54 years (44.8% and 35.8%). This is similar to Wahyuhadi and Ali KS' studies in 2018.<sup>5,6</sup> However, this is not in line with data from CBTRUS, where the incidence of meningiomas increased with age, and was commonly found in the elderly.<sup>4</sup> This difference might be due to an earlier exposure to oncogenes or substances that can trigger the onset of meningiomas, and also because of a longer life expectancy in the population in the United States. In Indonesia, there was an increasing trend of hormonal contraceptive use among women aged 15-49 years with injectable contraceptives being the most commonly used while in the US, the contraceptive use was mostly found at the age 40-49 years with the frequently used method was non hormonal contraceptive (sterilization).<sup>7,8</sup> This indicates the existence of higher and earlier hormonal exposure in Indonesian women compared to Americans, in which female sex hormones are one of the risk factors of meningiomas.

The results of this study showed that most of the patients were female, as found in some previous studies.<sup>5,9,10,11</sup> Meningiomas have a female predominance with a female to male ratio of 3:2.<sup>12</sup> The high incidence in women is likely due to the role of female sex hormones in meningiomas.

Based on some of the data obtained from medical records, there were no patients with a previous history of ionizing radiation exposure, and the majority of them had a history of hormonal contraceptive use. Wahyuhadi also reported that most meningiomas patients had a history of hormonal

contraceptive use.<sup>5</sup> This suggests that the influence of exogenous hormonal is significant in the oncogenesis of meningiomas. Most of the patients had no family history of malignancy, there was only one patient with a family history of breast cancer. Family history of malignancy is one of the risk factors of meningioma with weak evidence that should be verified by further studies to confirm its association with meningioma occurrence.<sup>3</sup>

Headache (34.3%) was the most common clinical manifestation found in this study. Meningioma is a benign slowly growing tumor. Along with its growth, this tumor will cause traction in both intra- and extracranial pain sensitive structures, such as dura mater, dural and cerebral arteries, venous sinus, and periosteum of the cranium.<sup>3</sup>

The most frequent location of meningioma found in this study were also reported by Mubeen (2019) and Niban (2017).<sup>13,14</sup> This is in accordance with the literature that most of meningiomas are located in cerebral convexity. This location is found in 20% of meningioma cases.<sup>15</sup>

Based on WHO grading system, we found that 89.5% meningioma were WHO grade I, followed by grade II (6%), and grade III (4.5%). Meningiomas are generally benign, 80-90% of tumors are grade I, 5-15% grade II, and 1-3% grade III. The higher the grading, the recurrence rate will increase.<sup>16</sup> In WHO grade I meningiomas, the most common subtype was meningothelial (45%); WHO grade II was atypical (75%); WHO grade III was anaplastic (66.7%). Similar finding has been observed in previous study.<sup>13</sup>

The majority of patients (88.1%) had a good outcome after hospital discharge. Meningiomas have

a good prognosis because most of them are benign, slow-growing, and well-defined so that the complete removal of the tumor will provide a better outcome.<sup>3</sup>

## 5. Conclusion

Meningioma was commonly found in the age group 35-44 years. The majority of patients were female, and most of them had a history of hormonal contraceptive use. Headache was the most common clinical manifestation. Majority of the patient had a good outcome. Meningiomas were most often located on cerebral convexity and based on histopathology, WHO grade I with meningothelial subtype was the most commonly found.

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