

## Demographic Characteristics and Anatomical Location of Primary Spinal Cord Tumour Patients operated at a Referral Neuroscience Hospital in Dhaka City

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### Abstract

**Background:** Spinal tumor can occur in different anatomical location. **Objective:** The purpose of the present study was to see the demographic characteristics and anatomical location of spinal tumour. **Methodology:** This descriptive cross sectional study was conducted in the Department of Neurosurgery at National Institute of Neurosciences & Hospital, Dhaka, Bangladesh from January 2016 to December 2019 for a period of around 04 (four) years. Patients presented with spinal tumor were selected as study population. The demographics characteristics were evaluated among all the patients. Patients were examined by MRI for the detection of anatomical location of the tumor. **Result:** A total number of 57 spinal tumor cases were recruited for this study. The mean age with SD of the study population was 38.7±13.24 years. The male and female ratio was 1.34:1 Most of the spinal tumor were found in the thoracic region which was 29(50.9%) cases followed by lumbar region which was 20(35.1%) cases. Spinal tumor in cervical region was found in only 5(8.8%) cases. **Conclusion:** In conclusion adult middle age male patients are the most commonly suffering from spinal tumor which are mostly located in the thoracic region. [*Journal of National Institute of Neurosciences Bangladesh, 2020;6(1): 15-18*]

**Keywords:** : Demographic characteristics; anatomical location; spinal tumour

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### Introduction

Primary spinal cord tumours are the tumours that originate from the spinal cord, its coverings or surrounding soft tissues except bony elements. Primary spinal cord tumors are one of the rarest categories of tumors, representing about 4-16 % of all tumors arising from the central nervous systems (CNS) according to previous reports<sup>1-3</sup>. Because of variation in population sizes studied and classification of tumors, the frequencies

of different spinal cord tumors vary among these reports. Although there are many reports on the epidemiology of all CNS tumors (including brain and spinal cord or brain only), there are less reports focusing upon epidemiology of spinal cord tumors alone<sup>4-5</sup>. The overall incidence is about .74 - 2.5 per 100000 persons<sup>6</sup>. The hospital-based incidences of various tumors, in the occurrence of age and gender were revealed in the analysis of tumors of the spinal cord, nerves, meninges. This present study was

undertaken to see the demographic characteristics and anatomical location of spinal tumour.

**Methodology**

This descriptive cross sectional study was conducted in the Department of Neurosurgery at National Institute of Neurosciences & Hospital, Dhaka, Bangladesh from January 2016 to December 2019 for a period of 4 (four) years. Patients presented with spinal tumor at any age with both sexes were selected as study population. The demographics characteristics like age and gender were recorded among all the patients. Patients were examined by MRI for the detection of anatomical location of the tumor. The locations of involvement were divided into 4 levels which were cervical, thoracic, lumbar, and lumbosacral regions. The patients with hematologic and bone malignancy were excluded from this present study. The data were analyzed by using SPSS and reported with descriptive statistics. Categorical variables were expressed as frequency and percentage with the range of the data set. However, the continuous variables were expressed as mean with standard deviation when these data set were normally distributed. The present study was approved by local ethical committee.

**Results**

A total number of 57 spinal tumor cases were recruited for this study. The mean age with SD of the study population was 38.7±13.24 years with the range of 14 to 70 years. Most of the patients were in the age group of 40 to 60 years of age group which was 27(47.4%) cases followed by 20 to 40 years of age group and less than 20 years which were 22(38.6%) cases and 6(10.5%) cases respectively. Only 2 cases were in the age group of more than 60 years of age group (Table 1).

Table 1: Age Distribution among Study Population (n=57)

Age Group	Frequency	Percent
Less than 20 Years	6	10.5
20 to 40 Years	22	38.6
40 to 60 Years	27	47.4
More than 60 Years	2	3.5
<b>Total</b>	<b>57</b>	<b>100.0</b>

Male was predominant than female which was 33(57.9%) cases and 24(42.1%) cases respectively. The male and female ratio was 1.34:1 (Table 2).

Table 2: Gender Distribution among the Study Population

Gender	Frequency	Percent
Male	33	57.9
Female	24	42.1
<b>Total</b>	<b>57</b>	<b>100.0</b>

Most of the spinal tumor were found in the thoracic region which was 29(50.9%) cases followed by lumbar region which was 20(35.1%) cases. Spinal tumor in cervical region was found in only 5(8.8%) cases. 3 (5.3%) were found in Lumbosacral region (Table 3).

Table 3: Anatomical Location of Spinal Tumor among study Population

Location	Frequency	Percent
Cervical Region	5	8.8
Thoracic Region	29	50.9
Lumbar Region	20	35.1
Lumbosacral Region	3	5.3
<b>Total</b>	<b>57</b>	<b>100.0</b>

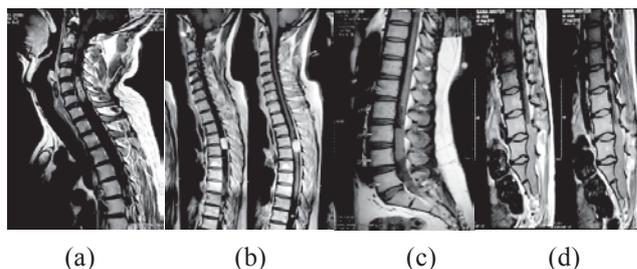


Figure 1: MRI of the spine showing spinal cord tumour at (a) cervical, (b) Dorsal, (c) Lumbar and (d) Lumbosacral region.

**Discussion**

Space occupying lesions in the spinal canal cause compression of the structures with resultant neurological deficits<sup>7</sup>. Rapidly growing lesions cause severe loss of function as there is no time for the spinal cord to adjust itself. The presence of a tumor interferes with the normal movements of the cord, which occur during movements of the spinal column. Such impairment contributes to cord damage<sup>8</sup>. In long standing tumors, there may be gliosis in the spinal cord due to ischemia and recovery may be incomplete despite complete removal of the tumor. Initial assessment of the patient with a primary spinal tumor requires meticulous application of common clinical tools including a detailed history and clinical examination<sup>9</sup>. Clinical presentation usually relates to pain, varying degrees of motor sensory deficits as well as bowel bladder symptoms in some, which may be due

to either mass effect or neurological compression<sup>10</sup>.

A total number of 57 spinal tumor cases were recruited for this study. The mean age with SD of the study population was 38.7±13.24 years with the range of 14 to 70 years. Most of the patients were in the age group of 40 to 60 years of age group which was 27(47.4%) cases followed by 20 to 40 years of age group and less than 20 years which were 22(38.6%) cases and 6(10.5%) cases respectively. Only 2 cases were in the age group of more than 60 years of age group. Similar results have been reported by Hirano et al<sup>11</sup> and have been analyzed on 678 patients with primary spinal cord tumors who are surgically treated. The mean age at surgery is 52.4 years with the range of 2 months to 92 years. When stratified by patient age in 10-year intervals, the patient groups aged 50 to 59 years and 60 to 69 years encompassed the largest number of patients with primary spinal cord tumors; only 4.1% of patients are under the 20 years of age. Hirano et al<sup>11</sup> have stated that the mean age of presentation of patients with IDDM tumors is 35.88 and those having IMSCT are 25.79 and in extradural tumors was 30.77. The mean age of IMSCTs in these series is less as compared to that of the western world; however, it is comparable to Indian reports. This is due to the presence of significant number of pediatric patients in this subgroup.

Male is predominant than female which is 33(57.9%) cases and 24(42.1%) cases respectively. The male and female ratio is 1.34:1. Therefore, this is a clear evident that male is most commonly suffering from spinal tumor. Similarly, Hirano et al<sup>11</sup> have stated that of the 678 patients, 55.6% are male and 44.4% are female which is consistent with the present study result. According to previous studies, the male and female ratios for patients with primary spinal cord tumors vary among countries from 40.0% male and 60.0% female in the USA<sup>12</sup>; furthermore, 60.3% male and 39.7% female is found in China<sup>13</sup>. In Asian countries spinal cord tumors predominantly occur in men, whereas in non-Asian countries they predominantly occur in women<sup>11</sup>. Furthermore, several studies have reported that spinal meningioma occurs much more frequently in women than in men<sup>7,9,14</sup>. The female preponderance for spinal meningiomas is universal<sup>11</sup>. As Engelhard et al<sup>9</sup> pointed out the female preponderance in meningiomas alone is enough to change male and female ratios for entire spinal cord tumor series (in non-Asian countries). However, in Asian countries, where the frequencies of spinal meningiomas overall are lower than in non-Asian countries, the male and female ratio for an entire series might not be affected

by the male and female ratio for meningiomas. Engelhard et al<sup>9</sup> have pointed out that there is a slight male preponderance for primary intraspinal tumors. There is a male preponderance in schwannomas, ependymomas, hemangiomas, hemangioblastomas, neurofibromas, malignant lymphomas, and lipomas<sup>15</sup>. The literature indicates that in western populations, the primary spinal tumors occur more frequently in females, whereas Asian studies show a slight male preponderance<sup>16</sup>. Similar male to female ratio has been reported by other studies from India<sup>8</sup>.

### Conclusion

In conclusion adult middle age patients are most commonly suffering from the spinal cord tumour. Furthermore, male is predominant than female. Interestingly the thoracic and lumbar region are the most common location of spinal tumor. Few cases are found in the cervical region. Further large scale study should be performed to see the real scenario.

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