Original Research Paper

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SPECTRUM OF SPINAL CORD NEOPLASMS : A FIVE YEAR STUDY

Pathology

KEYWORDS: Spinal Cord neoplasms, schwannoma, meningioma, astrocytoma, extradural, intradural extramedullary, intramedullary.

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ABSTRACT

Spinal cord tumors are rare tumors of the central nervou system. We present 63 cases of spinal cord tumors treated surgically in our hospital. The purpose of this study is to evaluate the relative frequency of various spinal cord tumors at Gandhi Hospital.

Materials & Methods : The present study was conducted over a period of 5 years from January 2010 to December 2014 ,those patients who presented with symptoms related to spinal cord tumors at our hospital. After detailed routine and special investigations were done to know the anatomical location, vertebral level of the mass and diagnosis of the spinal mass by histo pathological examination.

Results : Of the 63 patients in our study, 27 were males(43%), 36 were females(57%). M:F ratio – 0.75

The anatomical location of the tumors were extradural in 7 cases (11%), intradural extramedullary in 38 cases (60%) and intramedullary in 18 cases (29%). The histopathological diagnosis were schwannoma in 19 cases (30%), menigioma in 15 cases (24%), astrocytoma in 10 cases (16%), neurofibroma in 9 cases(14%), expendymoma in 6 cases(9%), small round cell tumors in 3 cases(5%), malignant peripheral nerve sheath tumor (MPNST) in 1 case.

Conclusion : In the present study there was a predominance of schwannoma (30%) followed by meningioma(24%) and Astrocytoma (16%). There was a female proponderance with maximum number of cases being located at the thoracic vertebral level.

INTRODUCTION:-

Spinal cord tumors are the rare categories of tumors representing about 4-16% of all tumors arising from the central nervous system. Because of variation in population size studied, the frequencies of different spinal cord tumors vary. Although there are many reports on the epidemiology of all CNS tumors (including brain & Spinal Cord), there are less reports focussing on epidemiology of spinal cord tumors alone.

The present study was conducted, to have a insight into the patterns of spinal cord neoplasms at our institute due to the rarity of study on the subject. The patients age, sex, anatomical location, vertebral level and histopathological diagnosis were noted in each case

Materials & Methods :-

The present study was conducted over a period of 5 years from Jan 2010 – Dec 2014 at our institute. 63 cases of spinal cord neoplasms reported during this period were included in the study.

Specimens received to the pathology department were subjected to the routine processing and paraffin embedding then the sections were stained with H&E and examined.

In each case patients age, sex, anatomical location of the tumor (Extradural, Intradural, Extramedullary, Intramedullary), vertebral level of the tumor (cervical, thoracic, lumbar) and histopathological diagnosis were determined.

Results :-

There were 63 patients with primary spinal cord tumors surgically treated during the period of this study.

Of the 63 cases 27(43%) were males and 36(57%) were females. Male : Female ratio being 0.75

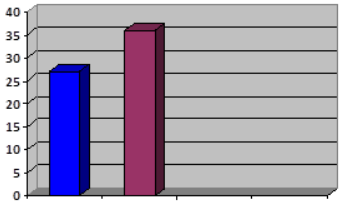
Patients age ranged from 3 months to 70 years. Maximum number of cases were found in 31-40 years of age group accounting for 28% (18 cases).Schwannomas were the most commonest of the tumors accounting for 30% (19 cases) followed by meningioma in 24% (15 cases), Astrocytoma in 16% (10 cases), neurofibroma in 14% (9 cases), ependymoma in 9% (6 cases), small round all tumors in 5%(3 cases) and MPNST in 2% (1 case).

In maximum number of cases, the anotomical locations was intradural extramedullary in 38 cases(60%)

The most common vertebral level of the tumor was thoracic spine in 26 cases(41%)

TABLE: 1

TYPE OF TUMOR	INCIDENCE
SCHWANNOMA	30%
MENINGIOMA	24%
ASTROCYTOMA	16%
NEUROFIBROMA	14%
EPENDYMOMA	9%
SRBCT	5%
MPNST	2%



Male and female patients in our study. (27:36).

Schwannomas were the most commonest of spinal cord tumors of the 63 cases patients, 19 cases (30%) were schwannomas. Most common anatomical location was intradural extramedullary and were mostly located in lumbar region. Maximum number of cases were in the age group of 31-40 years.Most of the cases showed

classical hypercellular areas with verocay bodies and hypocellular areas .15 cases (24%) of menigiomas were diagnosed with females predominated (9 cases) over males (6 cases).Thoracic spine was most commonly involved site for meningiomas and were intradural extramedullary in location. All were low grade meningiomas with morphological patterns being fibroblastic,meningothelial and one case of psammomatous meningioma were diagnosed in our study.

Astrocytomas constituted 10 cases (16%) in the present study , out of which 7 cases were females and 3 were males.Most commonly they were in the age group of 31-40 years. Thoracic spine was the most commonest vertebral location ,and most of them were low grade tumors and most of them were in the intramedullary locations.9 cases (14%) of neurofibroma were studied. Neurofibroma were common in males (6 cases) than females (3 cases).Maximum number of cases were in 31-40 years age group similar to astrocytoma. Neurofibromas predominated at the cervical spine and were intradural extramedullary in location.No other associated lesions or tumors were identified in patients with neurofibroma.

Of the 6 cases (9%) of ependymoma there was equal distribution in males (3 cases) and females (3 cases). Most of the cases were seen in 21-30 years age group and were intramedullary in location.

Ependymomas were equally distributed in cervical , thoracic and lumbar spine. Of the remaining 4 cases, 3 were small round cell tumors diagnosed asmedulloblastoma and one case of MPNST was seen

Discussion :

Primary spinal cord tumors are one of the rarest categories of tumors representing about 4-16% of all tumors arising from CNS .Spinal cord tumors are typically classified into 2 major groups – Extra dural & Intra dural. Extradural tumors usually arise from adjacent connective tissues. In contrast intradural tumors arising from neural , glial or meningial cells in the spinal cord and are subcategorized into intramedullary and extramedullary. Regarding the rarity of spinal cord tumors little population based studies are available .

Tumors of the glial origin like Astrocytoma, Ependymoma are usually intradural intramedullary in location where as nerve sheeth tumors (eg neurofibroma and schwannoma) are typically intradural extramedullary locations. Meningiomas can be either extradural or intradural extra medullary lesions . Nerve sheath tumors constitute about 25% of tumors arising in intradural extramedullary region . We evaluated 63 cases of primary spinal cord tumors diagnosed during a 5 years period. The incidence of primary spinal cord tumors varies in different series.

Among nerve sheath tumors schwanmoma (30%) followed by and neurofibroma(16%) were commonest in our study. Su et al , Hirano et al , sun et al , klekamp and samii et al , yu lun wu et al also showed the similar incidence comprising predominately of nerve sheath tumors followed by meningiomas and neuroepithelial tumors.

In our study nerve sheath tumors occurs most commonly at the level of lumbar spine, similar results were found in study by Koyama et al . In non-asian countires like USA, Europe& Australi, meningiomas are more common than nerve sheath tumor.

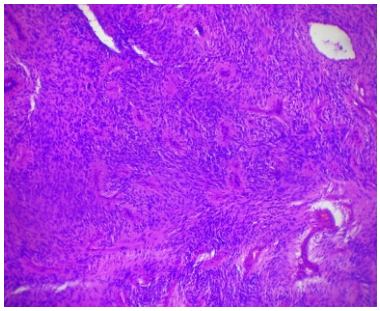
There were significant differences in prevalence of spinal cord tumors between asaian countries and Non – Asian Countries.

In our study there was a female preponderance for spinal meningiomas which correlated with Engethard et al and other previous studies .

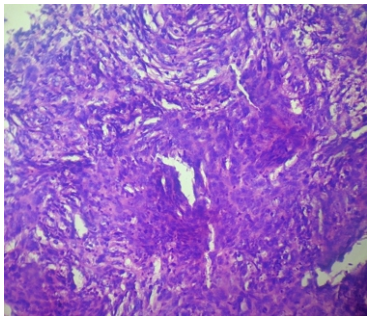
Our study reported that Ependymoma and Schwannoma are commonly found in middles aged patients, while meningioma are found in middle aged and older patients, similar results were found by Engethared et al . Average age of patients with meningioma was significantly higher than that of schwannoma and Ependymoma in our study which correlated well with previous studies .

In our study Dorsal region was the most frequent involved site in spinal cord (41%) as observed by Iyengar et al and Gelabert et al .

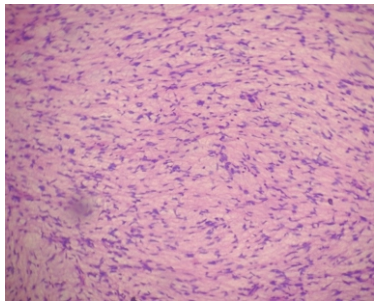
CONCLUSION: Lumbar spine was most commonest site for spinal cord tumors in our study and females were predominated over males. There are dissimilarities in the relative frequencies of spinal cord tumors among various reports. Some of the these discrepancies are due to differences in actual rate of occurence of these tumor. The relative frequency of spinal cord tumor in different parts of the world suggests the possible roles of environmental , genetic and hormonal factors in the etiology of spinal cord tumors.



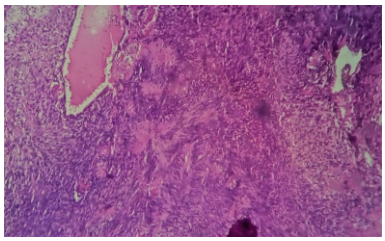
Picture 1:H & E,10X,Ependymoma



Picture 2: Meningioma (H & E),40 X



PICTURE 3: Neurofibroma (H & E) 10 X



Picture 4: schwannoma (10x,H& E)

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