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Retrospective Study of CNS Tumors in Tertiary Care Hospital

Rajul Iqbal Desai[1], Nidhi Shailesh Soni[2], Iqbal Mohammad Desai[3], Kunjlata Rajput[4]

[1]Consultant Histopathologist, G.R.M.I., Rajasthan Hospital, Ahmedabad, Gujarat, India; [2]Consultant Pathologist, G.R.M.I., Rajasthan Hospital, Ahmedabad, Gujarat, India; [3]H.O.D, G.R.M.I., Rajasthan Hospital, Ahmedabad, Gujarat, India; [4]Quality Manager, G.R.M.I., Rajasthan Hospital, Ahmedabad, Gujarat, India.

ABSTRACT

Background: Central Nervous System(CNS) tumors are group of neoplasms having different prevalence in different sex and age groups and various parts of CNS. The aim of our study to show the prevalence of various brain tumors and their age and sex distribution.

Methodology: The present 1.5 years study from a single tertiary care center, Gujarat research and medical institute, the patient diagnosed with CNS tumors and registered between 2014 and 2015 in the pathology department were consecutively screened. The inclusion criteria were cases of CNS tumors of all age groups. The tumors of peripheral nervous system. With these criteria, a total of 107 cases of CNS tumors were studied, and their histological typing and grading was done.

Result: All the CNS tumors were divided into seven categories: Tumors of neuroepithelial tissue; tumors of the cranial and paraspinal nerves; tumors of the meninges; lymphomas and hematopoietic neoplasms; germ cell tumors; tumors of the sellar region; and metastatic tumors. most common lesions were Astrocytic Tumours followed by Meningeal Tumors. Male to Female ratio is 1.0 : 0.98.

Conclusion: Nowadays there is an increase in incidence of CNS tumors in developing countries because of advanced health care and diagnostic facilities. Astrocytic tumors are the most common followed by meningeal tumors. The study shows prevalent pattern and comparison with similar studies. This may help in locating prevailing etiological index of that region.

Key Words: Astrocytoma, Central nervous system, Meningioma

INTRODUCTION

Brain tumors though not very common, result in significant morbidity because of their poor survival rate. A number of studies from Western countries have reported on the pattern, incidence and mortality of brain and central nervous system (CNS) tumors. Tumors of the central nervous system are a group of neoplasms having different prevalence in different sex and age groups and various parts of CNS. The tumors of central nervous system are reported to be less than 2% of all malignancy[1]. In developing countries like India, there is lack of resources which result in missing the diagnosis of new cases hence the exact tumor burden is underestimated. Hospital-based prevalence data, therefore, forms the basis for estimating the disease load. Nowadays health care and diagnostic facilities have advanced which leads to increase in incidence of CNS tumors in developing countries.[3]

All the CNS tumors were divided into seven categories: Tumors of neuroepithelial tissue; tumors of the cranial and paraspinal nerves; tumors of the meninges; lymphomas and hematopoietic neoplasms; germ cell tumors; tumors of the sellar region; and metastatic tumors. The WHO classification offers a crude histological grading system, in which each CNS tumor is classified as Grades I-IV according to its degree of malignancy. This system can provide an estimate for the prognosis of a patient. In this study, age, sex and the histological tumor type and grade were systematically recorded.

MATERIALS AND METHODS

The present 1.5 years study from a single tertiary care center, Gujarat research and medical institute, the patient diagnosed with CNS tumors and registered between 2014 and 2015 in

Corresponding Author:
Dr. Rajul Iqbal Desai, Consultant Histopathologist, G.R.M.I. ,Rajasthan Hospital, Ahmedabad , Gujarat, India.
Ph:9825444640; E-mail: ridesai2011@gmail.com

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the pathology department were consecutively screened. The H and E stained histopathological slides of biopsy received were evaluated. The cases were diagnosed and characterized where necessary using Immuno-histochemistry and categorized according to the WHO 2007 classification. The inclusion criteria were cases of CNS tumors of all age groups. The tumors of peripheral nervous system. With these criteria, a total of 107 cases of CNS tumors were studied, and their histological typing and grading was done.

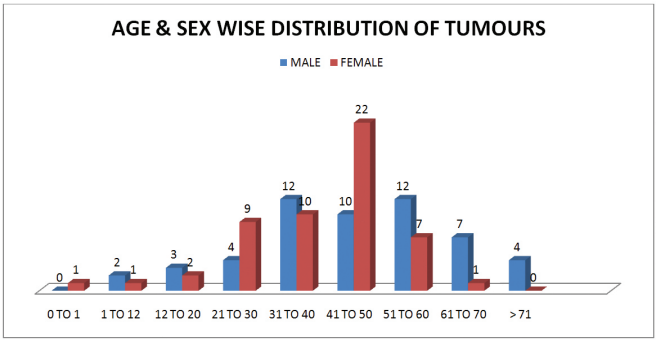
RESULTS

Total 107 cases were found at Gujarat Research Medical Institute, GRMI, Rajasthan Hospital for the period of 1.5 years. In our study most common lesions were Astrocytic Tumours followed by Meningeal Tumors . Out of total 107 cases of CNS tumours, 25 cases were of Astrocytic Tumours and 21 cases were of Meningeal tumours. There was almost equal sex ratio as there were 54 males & 53 females out of 107 cases of CNS tumours. Male to Female ratio is 1.0 : 0.98

Table 1: CNS tumors with histological subtypes and WHO grading & others

Tumour Type		Percentage
Tumours of Neuroepithelial Tissue		
Astrocytic Tumour	25	23.31
Oligodendroglial Tumours	6	5.62
Ependymal Tumours	2	1.87
Choroid Plexus Tumours	1	0.93
Embryonal Tumours	3	2.80
Tumours of Cranial and Paraspinal Nerves	15	14.05
Tumours of the Meninges		
Meningeal TX	21	19.65
Mesenchymal TX	3	2.80
Lymphomas and Haematopoietic Neoplasms	4	3.74
Tumours of the Sellar Region	3	2.80
Metastatic Tumours	4	3.74
Others	20	18.69

in our study, age distribution revealed that tumors were more common in age group 41 to 50 years (32 cases) followed by 31 to 40 years (22 cases).



Among various CNS tumours, the most common location was spinal region (24 cases - 22.43 %)followed by sellar and suprasellar region (17 cases - 15.88 %).

Table 2: Site wise location

Site	No.	%
Frontal	12	11.21
Temporal	6	5.61
Parital	6	5.61
Posterior	9	8.41
Occipital	2	1.87
Tentorial	4	3.74
Interventricular	4	3.74
CP Angle	8	7.48
Spinal	24	22.43
Seller and Supra	17	15.88
Sphenoid	3	2.80
Peri Sylvian	2	1.87
Others	10	9.35

In our study it is observed that Astrocytic Tumours have almost equal distribution in both Males & Females, However in Meningeal tumours are more common in females. And in the others category the most common tumor was Pituitary adenoma (12 cases).

Table 3: Sex distribution

Tumour Type		Male	Female
Tumours of Neuroepithelial Tissue			
Astrocytic Tumour	25	13	12
Oligodendroglial Tumours	6	3	3
Ependymal Tumours	2	1	1
Choroid Plexus Tumours	1	1	0
Embryonal Tumours	3	1	2
Tumours of Cranial and Paraspinal Nerves	15	6	9
Tumours of the Meninges			

Meningial TX	21	6	15
Mesenchymal TX	3	3	0
Lymphomas and Haematopoietic Neoplasms	4	2	2
Tumours of the Sellar Region	3	2	1
Metastatic Tumours	4	2	2
Others	20	14	6

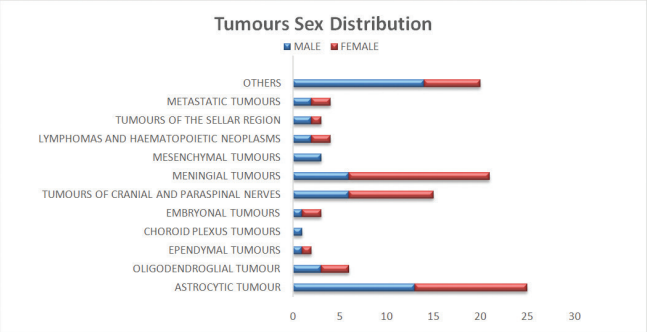


Table 4: CNS Tumour among age groups

Tumour Type	Total	0-1	1-10	11-20	21-30	31-40	41-50	51-60	61-70	> 71
Tumours of Neuroepithelial Tissue										
Astrocytic Tumour	25	0	1	1	4	4	5	6	1	3
Oligodendroglial Tumours	6	0	0	0	1	1	2	1	1	0
Ependymal Tumours	2	0	0	0	0	1	1	0	0	0
Choroid Plexus Tumours	1	0	1	0	0	0	0	0	0	0
Embryonal Tumours	3	0	0	1	1	0	1	0	0	0
Tumours of Cranial and Paraspinal Nerves	15	0	0	0	3	4	6	2	0	0
Tumours of the Meninges	0	0	0	0	0	0	0	0	0	0
Meningial TX	21	0	0	0	1	6	11	2	1	0
Mesenchymal TX	3	0	0	0	0	3	0	0	0	0
Lymphomas and Haematopoietic Neoplasms	4	0	0	0	0	1	0	2	1	0
Tumours of the Sellar Region	3	0	0	2	0	0	1	0	0	0
Metastatic Tumours	4	0	0	0	0	0	3	0	1	0
Others	20	1		2	1	4	2	6	2	2

DISCUSSION

In our study, we noted that Astrocytic tumour was the commonest tumor (23.31%) which was contrary to Surawicz et al (1999)[5] in USA & Lee et al (2010)[6] in Korea noticed that most common tumor was meningioma (31.2%).

Aryal G. et al (2011)[9] in Nepal noticed that astrocytomas were most common tumors of CNS followed by meningiomas. According to Materljan E et al (2004)[8], neuroepithelial tumors were common CNS neoplasm. Sex distribution showed that meningioma affects females more than males, as it was noted by Surawicz et al.[5]

In our study, astrocytoma was seen in males & females equally. According to Surawicz et al (1999) gliomas affect about 40% more males than females.[5] Our study showed that male to female ratio was 1.0 : 0.98, but according to Balkishan B Yeole et al (2008) , brain – nervous system cancer were more common in male than female.[1] But according to Lee et al (2010) 6 CNS tumors occurred in females more often than in males (female to male, 1.43: 1).

According to WHO classification, majority of lesions belonged to Grade I in comparison to grade III or IV. But in cases of astrocytoma, grade III lesion was more common in comparison to Grade I lesion.

CONCLUSION

Nowadays there is an increase in incidence of CNS tumors in developing countries because of advanced health care and diagnostic facilities. Astrocytic tumors are the most common followed by meningeal tumors. The study shows prevalent pattern and comparison with similar studies. This may help in locating prevailing etiological index of that region.

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