



ORIGINAL RESEARCH PAPER

Pathology

HISTOPATHOLOGICAL PATTERN OF VARIOUS INFRATENTORIAL TUMORS IN A TERTIARY CARE CENTER

KEY WORDS: Infratentorial, Histopathology, Brain Tumors, Schwannoma, Medulloblastoma

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ABSTRACT

Background: Brain tumor is one of the most devastating forms of human illness, especially when occurring in the infratentorial region. Mortality of patients with tumour occurring in this region is high. This is primarily due to limited space and presence of vital structures. **Aims And Objectives:** This study was done to ascertain the histological pattern of various tumours in infratentorial region of brain. **Materials And Methods:** A series of 80 cases of infratentorial neoplasms were studied retrospectively from January 2021 to December 2022. The routinely processed and Haematoxylin and Eosin stained histology section were used. **Results:** Adult patients predominated with 64.93% while in children it was 35%. The male to female ratio was 1.05:1. Medulloblastoma (15%), schwannoma (22.5%), meningioma (11.25%) and ependymoma (10%) were the commonest tumours seen. Epidermoids in infratentorial region were present in 17.35% cases. **Conclusion:** In our study it was found that schwannoma was the most common infratentorial neoplasm having female preponderance, Medulloblastoma are more common in children and meningioma in adults.

INTRODUCTION

The infra-tentorial space of the cranial cavity, limited by the tentorium above, has much smaller volume than the rest of the cranial cavity. The contents of such a comparably small space are several types of motor and sensory tracts and a number of vital nuclei and reticular formation for the systemic body functions and consciousness in the form of midbrain, pons and medulla. (1) Also, packed are cranial nerves, vascular network with large venous sinuses, changing volume of CSF in the ventricle and cisterns and prominently visible cerebellar parenchyma. Mass lesions within this compartment can lead to compression of the brainstem with subsequent herniation and death of the patient. (2)

Infratentorial space is one of the commonest site for occurrence of brain tumors. The tumors are a heterogeneous group, arising from the structures within the space and can either be benign or malignant with differing clinical presentation, behavior, management and prognosis. Tumors in the infratentorial space are particularly life threatening and have a high morbidity and mortality in patients mainly due to the small space with so many vital structures. Benign lesions in this location are just as important as malignant ones due to their presenting with compression of vital areas in the brainstem. (2)

AIM

The present study outlines the demographic and histological pattern of infratentorial brain tumors.

MATERIAL AND METHOD

This study was conducted at Department of Pathology, Gajra Raja Medical College, Gwalior. 80 cases of infratentorial tumors over 2 years period from January 2021 to December 2022 were studied. Records and histopathological slides stained with Hematoxylin and Eosin (H&E) of all the patients with infratentorial tumors were retrieved, analyzed and compiled.

Inclusion Criteria:

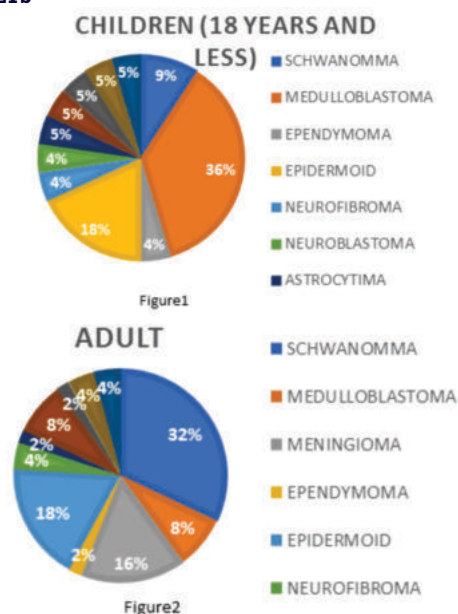
all operated patients of infra-tentorial tumors of brain

Exclusion Criteria: -

Autolyzed specimen

-Inadequate specimen

RESULTS



Adult population showed a preponderance with 64.93% cases while children included 35% cases. The most commonly occurring infra-tentorial tumor type in children was medulloblastoma. However, tumors like schwannomas and meningiomas were uncommon while metastases absent in children.

Most common histological tumor type in the adults were schwannoma and meningioma. While medulloblastoma and hemangioblastoma were less common. Secondaries were seen only in adults.

Gender Distribution

Results of the study revealed a male-predominance of 51.25% cases in overall infra-tentorial brain tumors with M/F-ratio of 1.05:1. More number of female cases were present in

schwannoma and meningioma .Where as medulloblastoma , ependymoma, hemangioblastoma , neurofibroma showed male preponderance. Astrocytoma , tuberculoma and secondaries showed equal number of male to female cases. Arachnoid cyst and abscess showed only female cases and neuroblastoma and brain stem cavernoma showed only male cases.

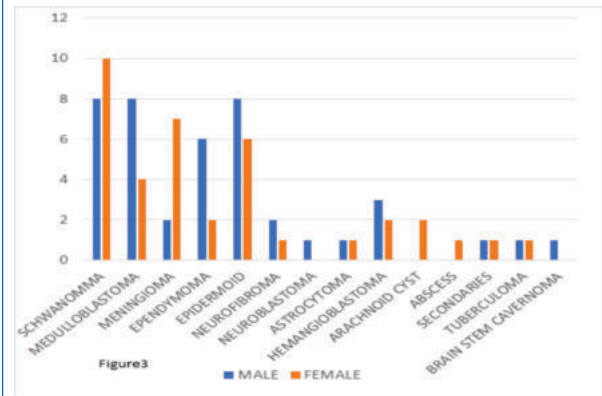


Figure3

HISTOLOGICAL TYPES	CASES	PERCENTAGE
SCHWANOMMA	18	22.5%
MEDULLOBLASTOMA	12	15%
MENINGIOMA	09	11.15%
EPENDYMOMA	08	10%
EPIDERMOID	14	17.5%
NEUROFIBROMA	03	3.75%
NEUROBLASTOMA	01	1.2%
ASTROCYTOMA	02	2.5%
HEMANGIOBLASTOMA	05	6.25%
ARACHNOID CYST	02	2.5%
ABSCCESS	01	1.2%
SECONDARIES	02	2.5%
TUBERCULOMA	02	2.5%
BRAIN STEM CAVERNOMA	01	1.2%

Schwannomma was the overall most commonly occurring infratentorial tumor type seen in 22.5 % cases.The other common types were medulloblastoma 15%, meningioma 11.15 % and ependymoma 10%.Hemangioblastoma, neurofibroma and astrocytoma were present in 6.25%, 3.75% and 2.5% cases respectively.Epidermoid cyst was present in 14 cases.Where as arachnoid cyst, abscess , tuberculoma , brain stem cavernoma and secondaries were present in 1-2% cases.

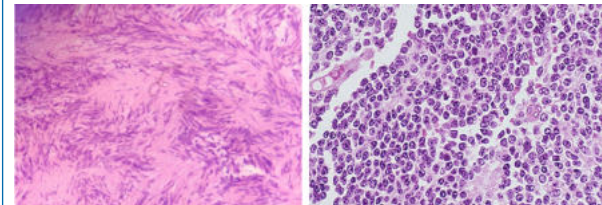


Fig 4:Schwanomma-compact small hyper cellular (Antoni A) and undifferentiated cells with hypo cellular (Antoni B) areas scanty cytoplasm (400x H&E)

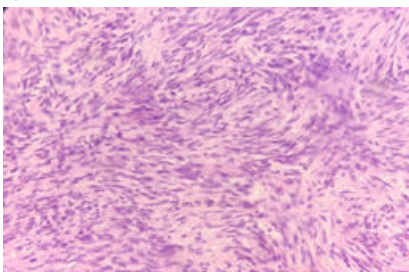


Fig 6:Meningioma – cells arranged in whorls (400x H&E)

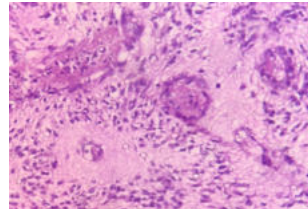


Fig 7:Ependymoma-Fibrillary perivascular pseudo rosette (400x H&E)

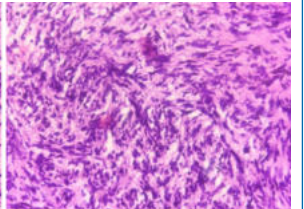


Fig 8:Neurofibroma-Loosely arranged spindle cells with collagen (400x H&E)

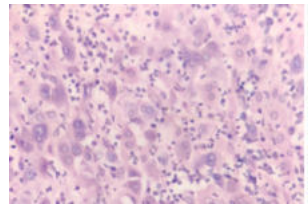


Fig 9:Hemangioblastoma-neoplastic stromal cells with foamy cytoplasm (400x H&E)

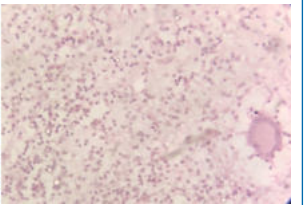


Fig 10: Tuberculoma-Granulomatous reaction (400x H&E)

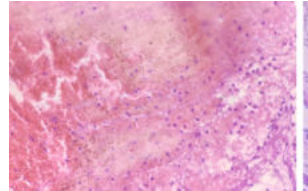


Fig 11:Brain stem cavernoma- congested vessels (400x H&E)

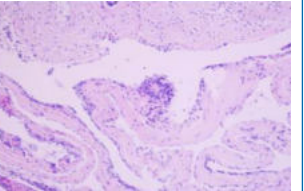


Fig 12:Arachnoid Cyst: Wall formed by connective tissue (400x H&E)

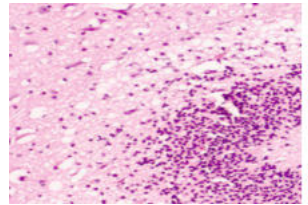


Fig 13: Brain abscess-inflammatory infiltrate (400 x H&E)

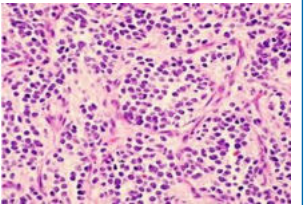


Fig 14:Neuroblastoma-Neuroepithelial cells with rosette (400x H&E)

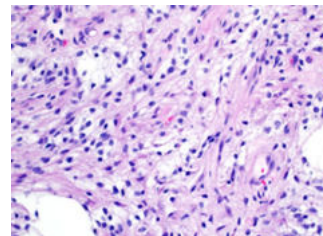


Fig 15:Astrocytoma – round to oval nuclei(400 x H&E)

DISCUSSION

In this study, adult population predominated with 64.93% cases and children included 35% cases similar to Bhat et al(1).Around 51.25% of the infratentorial tumors belonged to male gender. This male predominance was also reported by Bhat et al(1) ,Rehman et al(3) and Dukkkipati et al(5).The male to female ratio was 1.05:1 in this study similar to Shah et al(6) that reported a ratio of 1.1:1.Schwannomma was the most common overall tumor in this study similar to the finding of Bhat et al(1) having 24.8 % cases.Qadri et al(7) 2017 and Ahmed et al(8) reported medulloblastoma as commonest in children similar to the present study. In this study, adult females included more schwannomma cases and male children showed more medulloblastoma cases.In the present study meningioma in adults was present in 11.25% cases , ependymoma in 10% and hemangioblastoma in 6.25% cases similar to Salami et al(2).Astrocytoma, accounted for 2.5 % cases in this study in contrast to Ogun et al(8).Neurofibroma

was seen in 3.75% cases and neuroblastoma in 1.2% cases. In the present study, epidermoids were present in 17.35% cases which was a rare clinical entity in other studies. 1-2% cases of tuberculoma, abscess and brain stem cavernoma were seen in this study. Only 2 cases of secondaries in the infratentorial region were seen in this study and both were in adult population.

CONCLUSION

Infratentorial tumors encompass a wide variety of histological tumor types. The tumors of infratentorial space have all the potential to harm the vitality of infratentorial neural structures and lead to catastrophic outcome. There is a great variation in the frequencies of the tumors in age groups. The commonest infratentorial tumor in this series was schwannoma. In children, medulloblastoma was the most common type while meningioma was seen more in adults. There is rarity of metastases in this series.

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