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Pathology

Histopathological Study of Tumours of Central Nervous System in a Tertiary Care Hospital of Western Maharashtra

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Abstract **Original Research Article**

Background: Brain tumours comprise of heterogeneous group of benign and malignant tumours. Tumours of Central Nervous System are considered to be among the most notorious of all tumours. The present study helped in diagnosis of number of Central Nervous System tumour cases, their prognosis and further management depending on their grading. ***Aims and objectives:*** Aim of present study was to diagnose and classify tumours of Central Nervous System based on morphological features of WHO Classification of Central Nervous System tumours- 2007 and 2016 and to correlate histopathological findings with imaging studies and clinical details. ***Material and methods:*** Present study was a two years prospective study of 52 CNS tumours received in a tertiary care hospital from June 2016 to May 2018. Specimens were received in the form of biopsy and histopathological study was done. Detail records including clinical history and radiological findings were noted. ***Results*:** Out of 52 cases, maximum number of cases (n=19) were meningioma, followed by astrocytoma 15 cases. While choroid plexus papilloma was least in number i.e. 1 case. Maximum number of cases were in the age group of 51-60 years (26.92%) followed by 61-70 years age group (21.15%). Headache, giddiness and vomiting were the most common clinical presentation. Meningioma and schwannoma presented as slow growing tumours. ***Conclusion:*** Meningioma and astrocytoma form the majority of CNS tumors. There are limitations in making definitive diagnosis of CNS tumors with clinical examination and radiological investigations. Histopathological examination is the gold standard for making definitive diagnosis of CNS tumours which helps in further management.

Keywords: Central Nervous System, Tumours, Histopathological study.

INTRODUCTION

Brain tumours comprise of heterogeneous group of benign and malignant tumours arising from the brain parenchyma and its surrounding structures.

Brain tumours are among top ten causes of cancer related deaths. Primary brain tumors comprise approximately 2% of all malignant disease [1]. Tumours of Central Nervous System are considered to be among the most notorious of all tumours [2].In the present study the nature, duration and course of symptoms of CNS tumours were studied in detail and correlated with histopathological and radiological findings in patients coming to our tertiary care centre. The present study helped in diagnosis of number of Central Nervous System tumour cases, their prognosis and further management depending on their grading.

AIM AND OBJECTIVES

Aim of present study was to diagnose and classify tumours of Central Nervous System based on morphological features of WHO Classification of Central Nervous System tumours- 2007 and 2016 and to correlate histopathological findings with imaging studies and clinical details.

MATERIALS AND METHODS

Present study was conducted after ethical clearance from ethical committee. Present study was a two years prospective study of 52 CNS tumours received in a tertiary care hospital from June 2016 to May 2018.

The specimens were received in the form of biopsy. Detail record including clinical history and radiological findings were noted. All the specimens were received in the form of open craniotomy biopsy.

Gross examination was done as per College of American Pathologists guidelines (2014) and findings were noted. Tissue was submitted entirely for histopathological processing.

The microscopic findings were studied in detail and histopathological reports were given according to histomorphology of WHO classification of CNS tumours 2007 and 2016.Cytogenetics and molecular parameters suggested by revised WHO classification of CNS tumours 2016 could not be applied due to financial constraints and lack of facilities in our institute. Histopathological results were corelated with clinical and radiological findings.

OBSERVATIONS AND RESULTS

The study included 52 cases of Central Nervous System tumours carried out in the department of Pathology in a tertiary care hospital. Maximum number of cases were in the age group of 51-60 years (26.9%) followed by 61-70 years age group (21.1%), mean age being 50.8 years.

Out of 52 cases, 27 cases (51.92%) were males and 25 cases (48.08%) were females. Male to female ratio was 1.08:1.

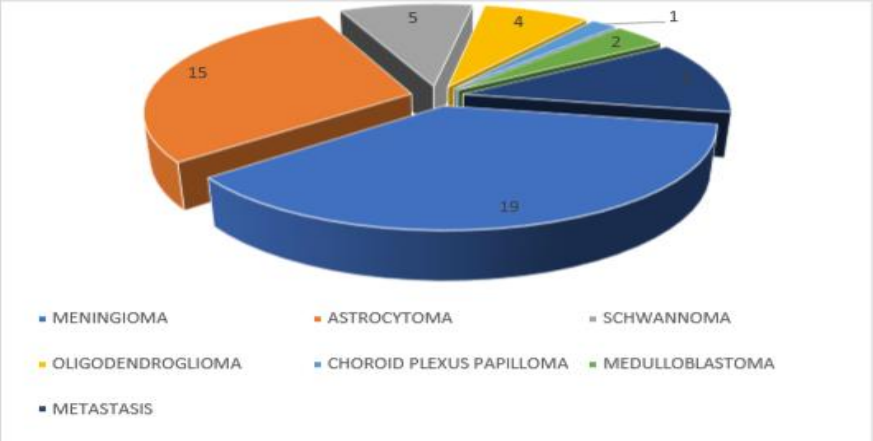

Fig-1: Histopathological diagnosis of CNS tumors

Maximum number of cases were of Meningiomas (n=19 i.e. 36.54%), followed by Astrocytoma (n=15 i.e. 28.84%).

Correlation of radiological diagnosis was done with histopathological diagnosis of all CNS tumours. Radiological examination failed to give definitive diagnosis in 19 (36.53%) out of 52 cases. Though radiological correlation was seen in cases of schwannoma, choroid plexus papilloma and metastatic tumours, it failed to diagnose all cases of oligodendroglioma and medulloblastoma.

Out of 52 cases, maximum number of cases i.e.44 (84.61%) were clinically diagnosed as space occupying lesion, followed by 6 cases(11.53%) infarction and 2 cases (3.84%) infection.

Overlapping of clinical features was observed. Headache (96.15%) was the most common symptom, followed by giddiness (53.84%), vomiting (38.46%), limb weakness (25%), seizures (13.46%), hearing loss(11.53%) and diminished vision(11.53%).

The frontal lobe was most commonly affected either alone or in combination with parietal and temporal lobe in 21 cases (40.38%).

Out of 52 cases, maximum number of cases i.e. 44 cases (84.61%) showed solitary lesion and 8 cases (15.38%) were multicentric which were meningiomas (4 cases) and metastasis (4 cases). Twenty two cases (42.30%) were grading I tumours while 10 cases (19.23%) were grade IV tumours.

Out of 19 cases of meningioma, maximum number of cases i.e. 5 cases (26.31%) were in the age group of 41-50 years and revealed female preponderance (68% cases).

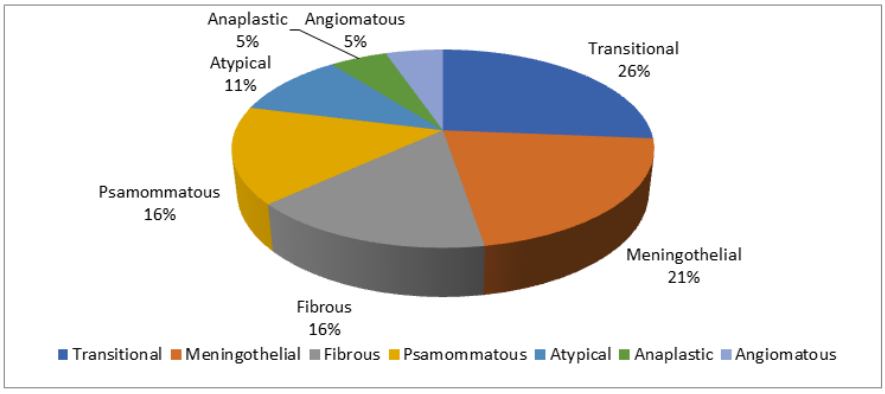

Fig-2: Subtyping of meningioma

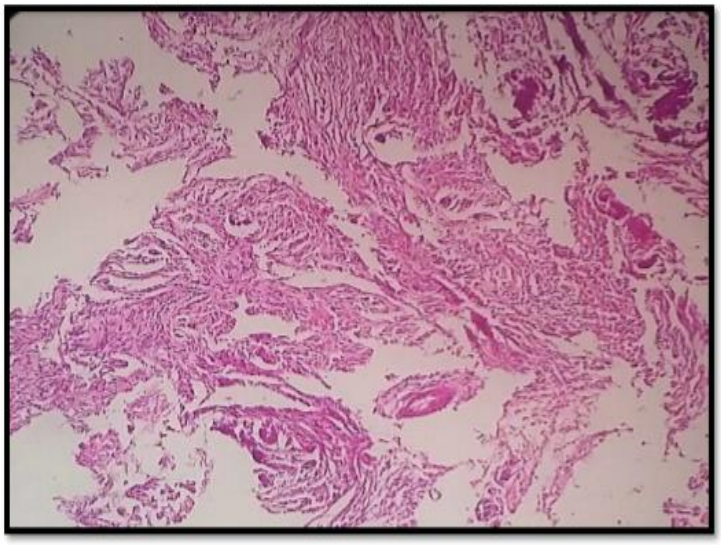

Fig-3: Transitional meningioma showing fibrous & syncytial pattern (H&E 40x)

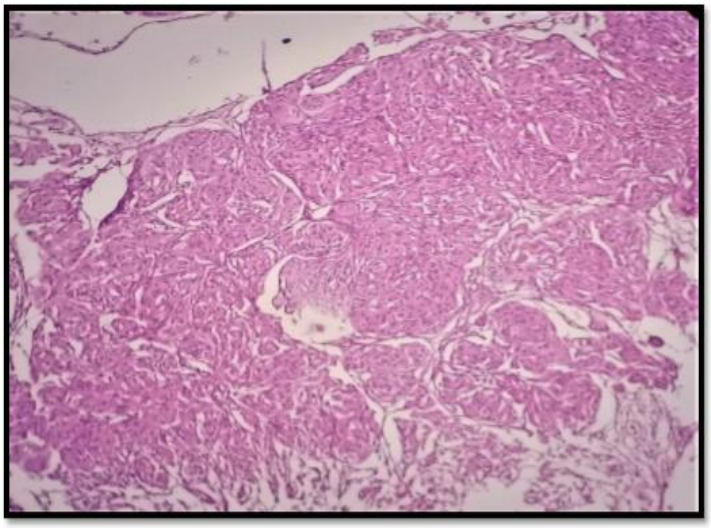

Fig-4: Meningothelial meningioma showing neoplastic cells having oval nuclei, indistinct cell borders in syncytial pattern (H&E 100x)

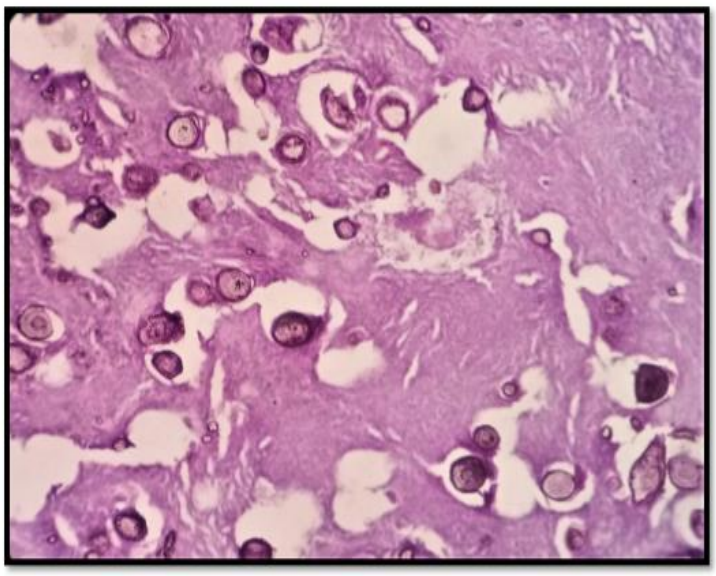

Fig-5: Psamommatous meningioma showing psamomma bodies (H&E 40X)

Out of 15 cases (28.84%) of astrocytoma, maximum number of cases i.e.5 cases (33.33%) were in the age group of 51-60 years followed by 4 cases (26.66%) of 61-70 years. Male to female ratio was 3:2.

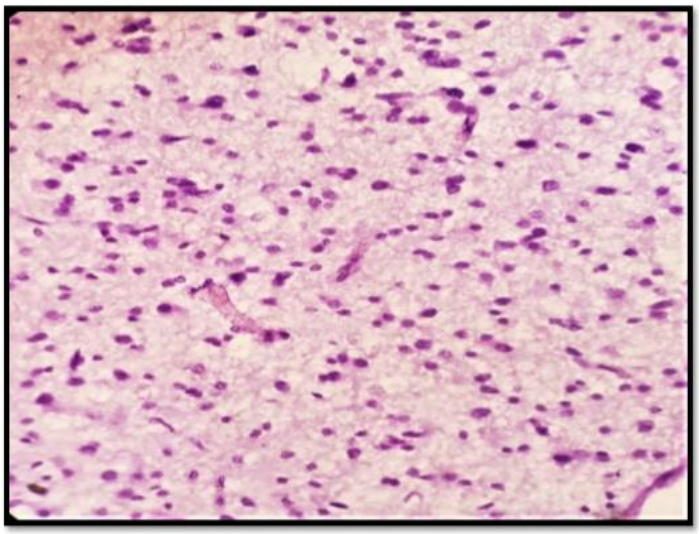

Fig-6: Grade ii astrocytoma showing diffusely arranged neoplastic cells. (H&E 100X)

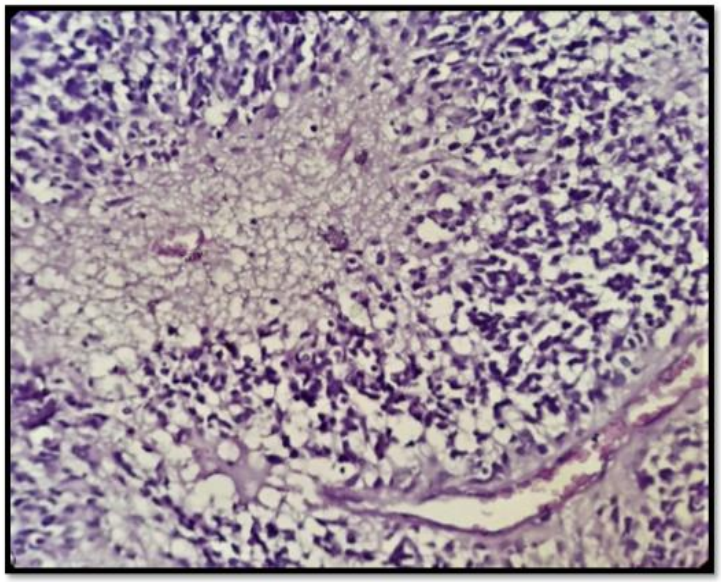

Fig-7: Glioblastoma multiforme showing stellate necrosis with pseudo palisading of neoplastic cells (H&E 400X)

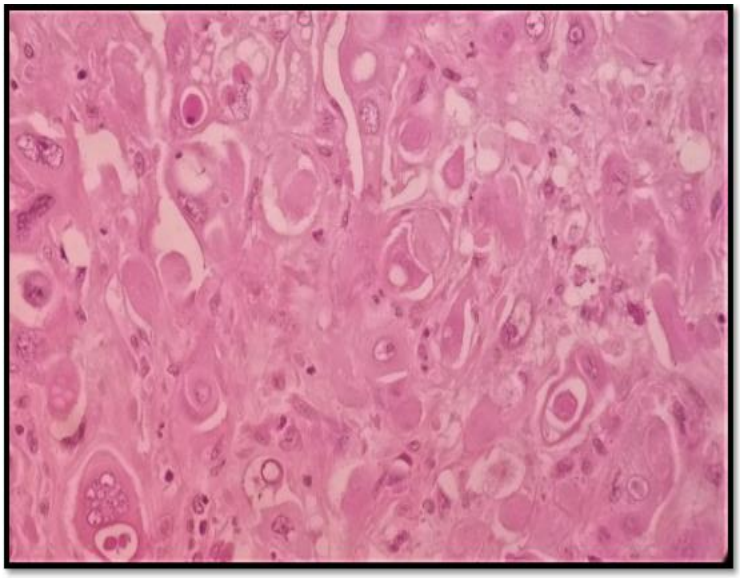

Fig-8: Pleomorphic xanthoastrocytoma showing spindle and multinucleated giant cells with vacuolated cytoplasm (H&E 400X)

Out of 5 cases (9.61%) of schwannoma, 3 cases were female (60%) and 2 cases (40%) were male and age distribution was 20-70 years.

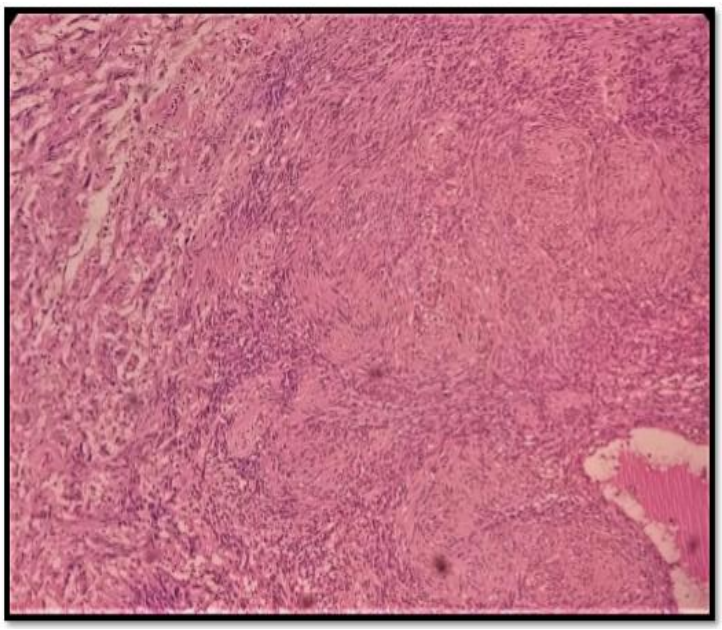

Fig-9: Schwannoma showing neoplastic cells with antoni a and antoni b pattern (H&E 40X)

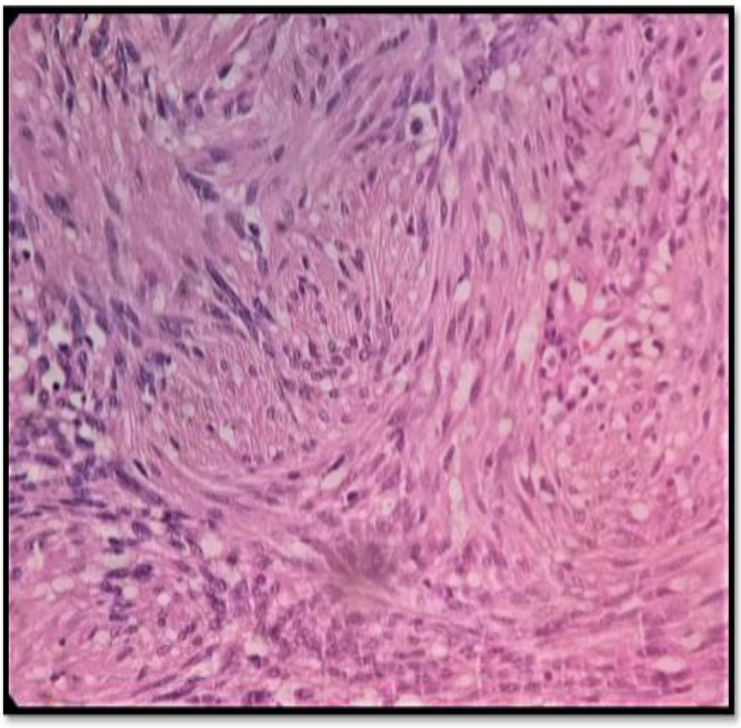

Fig-10: Schwannoma showing spindle shaped neoplastic cells with nuclear palisading (H&E 400X)

Out of 52 cases of CNS tumours on histopathology, 4 cases (7.69%) were oligodendroglioma, age distribution was 51-80 years and 75% were male patients.

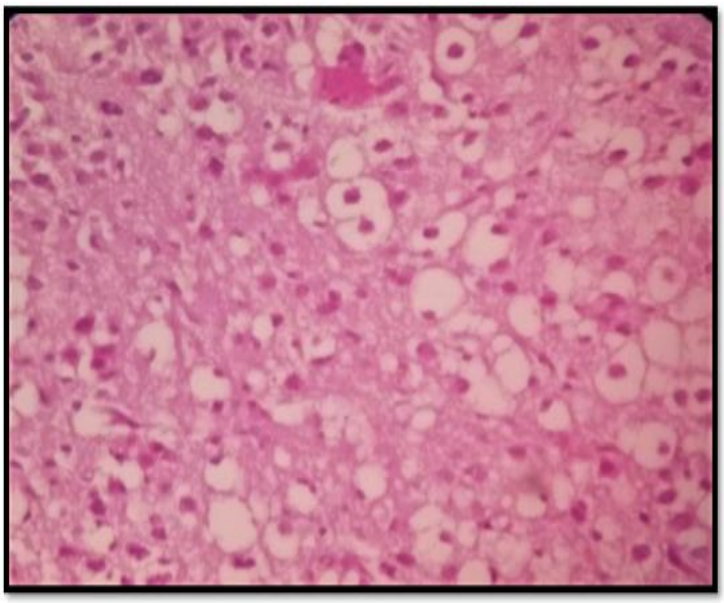

Fig-11: Oligodendroglioma showing tumour cells with uniform round nuclei and perinuclear halos (H&E 400 XS)

Out of 52 cases of CNS tumours on histopathology, 1 case was choroid plexus papilloma (1.92%) affecting 4 year's male child.

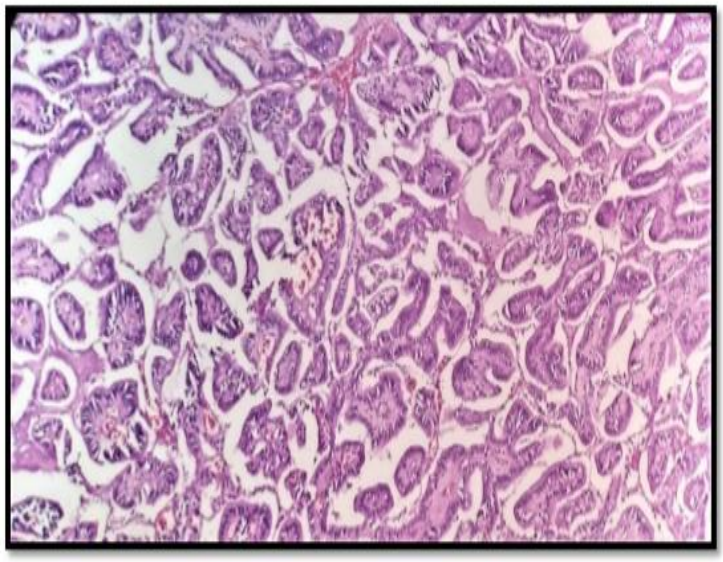

Fig-12: Choroid plexus papilloma showing neoplastic cells in papillary fronds (H&E 100X)

Out of 52 cases of CNS tumours on histopathology 6 cases (11.53%) were metastatic tumours. Out of these, 2 cases were metastasis from multiple myeloma and one case each of metastatic mucoepidermoid carcinoma from ethmoid sinus, metastatic papillary carcinoma of thyroid, metastatic adenocarcinoma with unknown primary site and high grade malignancy with possibility of metastatic origin. Out of 6 cases of metastasis,2 cases(33.33%) each were in the age group of 41-50 years ,51-60 years and 61-70 years age group.

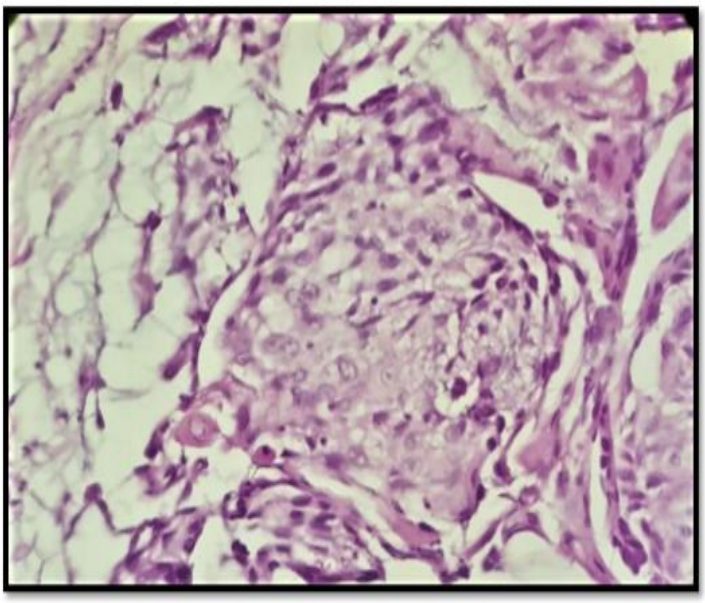

Fig-13: Metastatic mucoepidermoid carcinoma: intermediate cells, squamoid cells and mucinous areas (H&E 400X)

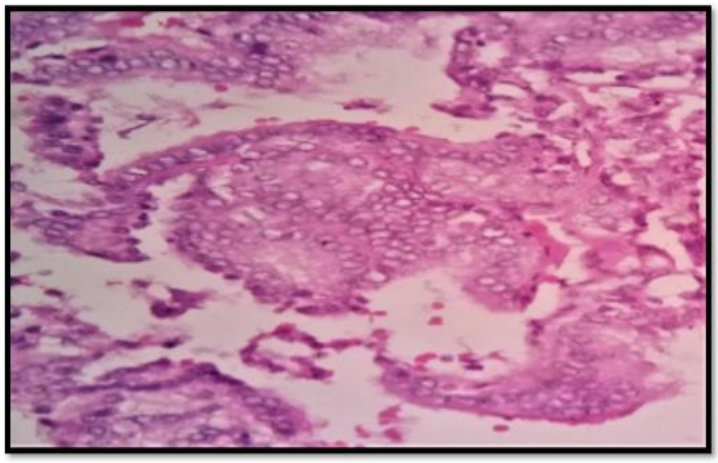

FIg.14: Metastatic papillary carcinoma of thyroid showing tumour cells with ground glass nuclei (H&E 400X)

DISCUSSION

In the present study, males slightly outnumbered female with male to female ratio1.08: 1. Similar findings were found in studies done by Ghanghoria *et al.* [2], Nibhoria *et al*. [3].

In the present study, out of 52 cases, meningioma (36.54%) was the most common histopathological diagnosis followed by astrocytoma (28.84%). While choroid plexus papilloma was minimum in number as 1 case (1.92%).These findings were in concordance with studies done by Ghanghoria *et al*. [2] and Kanthikar *et al.* [4].

In the present study, most common clinical presentation was headache (96.15%), followed by vomiting (38.46%), limb weakness (25%) and seizures (13.46%). Similar observations were found by other studies done by Masoodi *et al*.[5], Strong *et al*.[6] and Tesfay *et al*.[7].

In the studies conducted by Masoodi *et al*.[5] and Pinho *et al*. [8] there was predominance of supratentorial tumours which was concordant with the present study.

Most commonly affected anatomical site was frontal lobe (40.38%).Similar observations were observed by studies done by Thambi *et al*. [9], Masoodi *et al*. [5] and Kumari *et al.* [10].

The commonest age group in cases of meningiomas was 41-50 years with female dominance as observed by Ghanghoria *et al.* [2], Kanthikar *et al*. [4] and Nibhoria *et al*. [3].

Astrocytomas were more common in males than females. Similar findings were also observed by Ghanghoria *et al.*[2] , Kanthikar *et al.*[4] and Nibhoria *et al.*[3].

In the present study, primary CNS tumours (88.46%) were more common in comparison with metastatic tumours (11.53%). These findings were in concordance with studies done by Kumari *et al.*[10] and Aryal *et al.*[11].

CONCLUSION

Meningioma and astrocytoma form the majority of CNS tumors, the commonest clinical presentation being headache, giddiness, vomiting, limb weakness and seizures.

There are limitations in making definitive diagnosis of CNS tumors with clinical examination as well as radiological investigations. Hence, histopathological examination is the gold standard for making definitive diagnosis of CNS tumours.

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REFFERENCES

1. Ghosh M, Shubham S, Mandal K, Trivedi V, Chauhan R, Naseera S. Survival and prognostic factors for glioblastoma multiforme: Retrospective single-institutional study. Indian journal of cancer. 2017 Jan 1;54(1):362.
2. Ghanghoria S, Meher R, Kulkarni CV, Yadav A, Patidar H. *IJMSPH*.2014;3(10):1205-1207.
3. Nibhoria S, Tiwana KK, Phutela R, Bajaj A, Chhabra S, Bansal S. Histopathological spectrum of Central Nervous System Tumors: a single centre study of 100 cases. IJSS.2015;3(6):130-4.
4. Kanthikar SN, Nikumbh DB, Dravid NV. Histopathological overview of central nervous system tumours in North Maharashtra, India: a single center study. IJPO. 2017;4(1):80-4.
5. Masoodi T, Gupta RK, Singh JP, Khajuria A. Pattern of Central Nervous System neoplasms: a study of 106 cases. JK-Practitioner.2012;17(4):42-6.
6. Strong MJ, Garces J, Vera JC, Mathkour M, Emerson N, Ware ML. Brain Tumors: Epidemiology and Current Trends in Treatment. Journal of Brain Tumors & Neurooncol. 2015;1:102-108.
7. Tesfay M, Hawaz Y, Assefa G, Abebe M. Radiological Features and Postoperative Histopathologic Diagnosis of Intracranial Masses at Tikur Anbessa Specialized Hospital and MCM Hospital. East Cent Afr J Surg.2013;18(1):95-106.
8. Pinho RS, Andreoni S, Silva NS, Cappellano AM, Masruha MR, Cavalheiro S. Pediatric Central Nervous System tumors: a single-centre experience from 1989 to 2009. J Pediatr Hematol Oncol.2011;33(8):605-9.
9. Thambi R, Kandamuthan S. Histopathological Analysis of Brain Tumours-A Seven Year Study from a Tertiary Care Centre in South India. JCDR. 2017 Jun;11(6):5-8.
10. Kumari V, Vaangala N. Incidence of Different Lesions in Brain-2 year study in a Teaching Hospital in Telangana, India. MRIMS J Heal Sci.2015;3(2):121-4.
11. Aryal G. Histopathological pattern of central nervous system tumor: A three year retrospective study. Journal of Pathology of Nepal. 2011;1(1):22-5.