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ORIGINAL ARTICLE

PAEDIATRIC POSTERIOR FOSSA TUMORS: A CLINICO-PATHOLOGICAL STUDY IN A TERTIARY CARE HOSPITAL

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ABSTRACT: INTRODUCTION: Tumors of the Central Nervous System, are the second commonest childhood tumors and are the most common solid paediatric tumors comprising 40% - 50% of all tumors.[1 2] Posterior fossa brain tumors are one of the most devastating forms of human illnesses which are more common in children. **AIMS AND OBJECTIVES:** To study the incidence, clinicopathological features and management of paediatric posterior fossa tumors. **MATERIALS AND METHODS:** This is a prospective study done in the Department of Neurosurgery, Rangaraya Medical College, Government General Hospital, Kakinada from 2012 to 2015. It is a Tertiary Care Hospital. A total of 25 paediatric patients ranging from infants to 15 years were included in the study. **DISCUSSION AND CONCLUSION:** Posterior fossa tumors are the commonest solid brain tumors of children with a rate of 2.4 per lakh of children at risk per year. The predominant symptoms are headache and vomiting followed by cerebellar symptoms (gait disturbances). Posterior fossa tumors are predominantly seen in children with peak incidence in first decade. Commonest presenting symptoms are due to raised intracranial pressure with headache and vomiting followed by cerebellar symptoms. Meticulous microsurgical techniques are to be followed in removing these tumors. The incidence of recurrence is very less after gross total excision. Prognosis is good in patients with total excision.
KEYWORDS: Posterior fossa tumors, Solid brain tumors.

INTRODUCTION: Tumors of the Central Nervous System, are the second commonest childhood tumors (20%) after leukemia (37%) and are the most common solid paediatric tumors comprising 40%-50% of all tumors.[1,2] Posterior fossa brain tumors are one of the most devastating forms of human illnesses which is more common in children. Brainstem compression, herniation and death are the risks associated with these tumors. Posterior fossa tumors (infrateritorial) tumors comprise between 54-70% of childhood brain tumors compared to 15-20% in the adult population.[3] The estimated incidence of brain tumors in children is 2-3.5 per lakh children. Common posterior fossa brain tumors in children include juvenile pilocytic astrocytoma (JPA), medulloblastoma (MB), Ependymoma and Brainstem glioma. Less frequently, atypical rhabdoid/teratoid tumor (ATRT), Hemangioblastoma (HB), dermoids, schwannoma of the VIIIth cranial nerve, cerebellar gangliocytoma, meningioma and high grade glioma. Posterior fossa tumors are considered as some of the most critical brain lesions. This is due primarily to the limited space within the posterior fossa, as well as the potential involvement of the vital brainstem nuclei. Presentation with acute symptoms of brainstem involvement will need an emergency operation.

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AIMS AND OBJECTIVES: To study the incidence, clinicopathological features and management of paediatric posterior fossa tumors.

MATERIALS AND METHODS: This is a prospective study done in the Department of Neurosurgery, Rangaraya Medical College, Government General Hospital, Kakinada from 2012 to 2015. It is a Tertiary Care Hospital. A total of 25 paediatric patients ranging from infants to 15 years were included in the study. In all the patients the duration of symptoms ranges between 1 month to 6 months. Features of raised intracranial pressure like headache, vomiting's were the commonest mode of presentation followed by cerebellar symptoms and signs. All patients underwent C.T. and MRI. All patients underwent posterior midline craniectomy with excision of tumor. CSF diversion procedure like external ventricular drainage or ventriculoperitoneal shunt pre or post definitive procedure was done.

DISCUSSION AND ANALYSIS: Posterior fossa tumors are the commonest solid brain tumors of children with a rate of 2.4 per lakh of children at risk per year. The youngest case reported in literature was 6 weeks old by Rorke L 1987.[4] In the present study the youngest patient is 1 year and 3 months old. Posterior fossa tumors are more common in the age group between 1 to 9 years. In this study 80% of cases are seen below 10 years. In a study by Albright AL et al,[5] most of the posterior fossa tumors are seen in the age group between 1 to 10 years. In a study by May PL et al 1991[6] a slight male predominance was seen in the sex incidence. In the present study males are 16(64%) and females are 9(36%). The male predominance may be due to increased number of male children being investigated due to social factors. In the clinical presentation headache was the predominant symptom in most of the studies with 80 to 92% of cases in a study by Sutton et al in 1989.[7] This was followed by vomiting in 60% and gait disturbances. In the present study the predominant symptoms were also headache and vomiting seen in 17 and 11 patients followed by cerebellar symptoms (gait disturbances). Convulsions were seen in 6 patients in the present study. In the present study the predominant signs were ataxia and papilloedema seen in 10 patients (40%). 11 patients (44%) presented with cranial nerve palsies. According to the site of tumors, in the present study the cerebellum is the commonest site 60%, followed by fourth ventricle 28%, extrinsic 8% and brainstem 1%. The most common pathological types in the present study was medulloblastoma 36%, astrocytoma 24%, ependymoma 16% brainstem glioma 8%, tuberculoma 8% meningioma 4% and choroid plexus papilloma 4%. These are similar to the study according to childhood hospital Philadelphia[7] and the study of sick children hospital (Toronto).[8] These tumors were surgically managed by near total excision or subtotal excision. Although long survival period are generally reported, a high incidence of recurrence ranging from 5% to 17% is seen in many studies by Austin in 1984 and by Geissenger and Bucy in 1971.[9] The extent of surgical resection is the most important factor for recurrence. Recurrence is common after subtotal removal and rare after total removal. Grossly solid tumors have an increased tendency for recurrence. In a study by Qwallner and colleagues (1988)[10] it was found that pilocytic astrocytomas are associated with improved survival. A recurrence of 5.6% was reported in a study by Bruse and Falavigne A (1993).[11] In the present study it was seen that total resection influences surgical outcome and quality of life. In the

present study, all patients with ependymomas were subjected to radiotherapy which is similar to the study by Salazar OM (1983).[12] All children with medulloblastoma received adjuvant radiotherapy and chemotherapy which improves survival. In the present study near total excision of tumor was achieved in more than half of the patients and in 40% of cases subtotal resection was done and in one brainstem glioma case only biopsy was done.

CONCLUSION: Posterior fossa tumors are predominantly seen in children with peak incidence in first decade. Commonest presenting symptoms are due to raised intracranial pressure with headache and vomiting followed by cerebellar symptoms. Majority of the tumors are medulloblastomas, cerebellar astroyctomas and ependymomas. The most commonest location is the cerebellar vermis followed by fourth ventricle and brainstem. Meticulous microsurgical techniques are to be followed in removing these tumors because important structures are present around the surgical field. The incidence of recurrence is very less after gross total excision. Prognosis is good is patients with total excision.

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RESULTS:

Age	No. of patients	Percentage
0 – 5	12	48%
6 – 10	08	32%
11 – 15	05	20%

Table I: Distribution of Patients according to Age

Sex	No. of patients	Percentage
Male	16	64%
Female	09	36%

Table II: Distribution of patients according to Sex

Symptom/ Sign	No. of Patients	Percentage	Mean Duration in Months
Headache & Vomitings	17	68%	2.0
Cranial nerve palsy	11	44%	3.0
Motor (Pyramidal Tract Signs)	06	24%	2.5
Cerebellar Signs	14	56%	4.5
Blurred/ Dimness of vision (Papilloedema)	04	16%	1.0
Convulsions	06	24%	1.2
Hydrocephalus	18	72%	1.2

Table III: Distribution of Patients according to clinical presentation

Treatment	No. of patients	Percentage
Near total excision	14	56%
Subtotal excision	10	40%
Biopsy	01	4%

Table IV: Distribution of patients according to type of treatment

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Tumor Type	No. of Patients	Percentage	Male	Female
Medulloblastoma	09	36	06	03
Astrocytoma	06	24	04	02
Ependymoma	04	16	03	01
Tuberculoma	02	08	01	01
Brainstem glioma	02	08	01	01
Meningioma	01	04	01	-
Choroid Plexus Papilloma	01	04	01	-

Table V: Distribution of Patients according to Histopathology

Location	No. of patients	Percentage
Cerebellum	15	60%
Fourth Ventricle	07	28%
Brainstem	01	4%
Extrinsic	02	8%

Table VI: Distribution of patients according to Anatomical location of tumors

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