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Clinical and Radiological Assessment of Children (0-18 Years) with Intracranial Space-Occupying Lesions

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Abstract: ***Aim: The aim of the present study is to understand the clinical presentation and etiologies associated With Intracranial space occupying (ICSOL) lesions in children and to determine the frequency of different types of ICSOL at various anatomical locations. Methods: 21 children who attended the pediatrics department with ICSOL were selected. All the children were evaluated by taking a detailed history, thorough clinical examination was done, and all children were subjected to relevant investigations to find out the cause of ICSOL. Children with neural tube defects were excluded from the study. Results: In the present study, infective lesions were seen in 12 cases (57.1%) and non infectious lesions were seen in 9 cases (42.9%), among the ICSOL, tuberculoma is the most common group with 10 cases (47.6%), followed by 8 cases (38.1%) of neoplasm's, 2 cases(9.5%) of abscess and 1 case (4.8%) of arachnoid cyst . The most common location of the ICSOL is the supratentorial space 11cases (52.4%), infratentorial lesions 9 cases (42.8%) and in both areas 1 case (4.8%). Most common feature of ICSOL is headache (66.7%) followed by seizures (42.9%), vomiting (33.3%). Tuberculoma are most commonly associated with headache and seizures whereas Neoplastic SOL is mostly associated with Headache, vomiting, ataxia and visual deficit. CT findings show hydrocephalus in 2 cases (9.5%), enhancement with dye in 17 cases (80.9%), focal cerebral edema in 15 cases (71.4%). Conclusion: Among the space-occupying lesions, infective lesions like tuberculomas and brain abscess constitute the major lesions which can completely be cured. So, early diagnosis and institution of appropriate treatment are the cornerstones in better outcomes of the brain lesions.***

Keywords: Tuberculoma, Brain Neoplasm's, CT scan

1. Introduction

1) Intracranial lesions occupying space within the skull, which cause a rise in the intracranial volume are known as intracranial space-occupying lesions (ICSOL).
2) ICSOL produces focal signs by interfering with the function of the neighboring part of the Brain[1].
3) During, the first two years of life and adolescence, supratentorial tumors predominate, while the infratentorial tumors are predominant throughout the rest of the life.
4) Tuberculomas constitute the largest percentage of ICSOL.
5) There are two major histological types of neoplasms – glial tumors and primitive neuroectodermal tumors. Tumors of embryonic histology such as medulloblastoma, neuroendocrine tumors, and Pineoblastoma occur exclusively in children and young adults[2].
6) Intracranial tumors are the most common solid tumors of childhood, with incidence rates of 20, 000-50, 000 for one million children representing 20% of all malignancies.
7) The present study is undertaken to evaluate the incidence, various causes, and types of intracranial space-occupying lesions with the clinical and radiological profile.

Purpose of study

1) To study the etiology and clinical features of ICSOL in children between 0-18 years of age.
2) To know the age and sex incidence of ICSOL.
3) To know the frequency of different types of ICSOL at various anatomical locations.
4) To evaluate the cause of various ICSOL using CT and MRI.

2. Materials and Methods

In the present study, 21cases of ICSOL admitted consecutively in the Department of Paediatrics and Neurosurgery of Katuri Medical College, Guntur was included.

Type of study: Prospective. Study duration: 9 months.

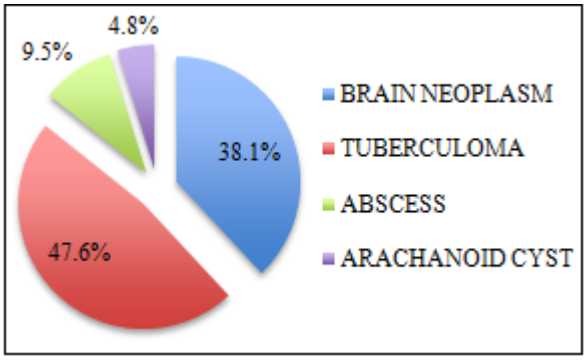
Inclusion Criteria

Children in the age group of 0 - 18 years with a history of seizures, signs of raised ICT, focal neurological deficits, and other CNS manifestations.

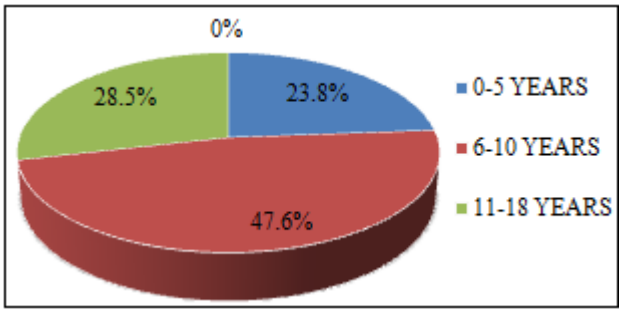
3. Observations and Results

All patients were examined clinically and investigated thoroughly with appropriate investigations.

Incidence of Various Lesions

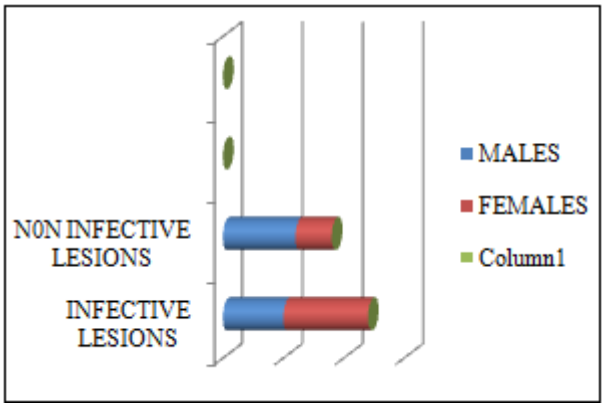


Age Incidence



1) The incidence of ICSOL, was almost equal in both the sexes and it was in the ratio of 1.1:1.
2) The infective lesions were more common in females than in males.
3) The noninfective lesions were more common in males than in females.

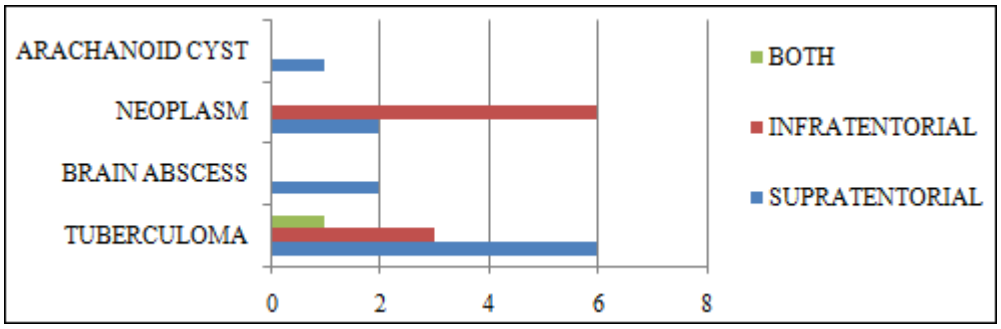
Sex Distribution



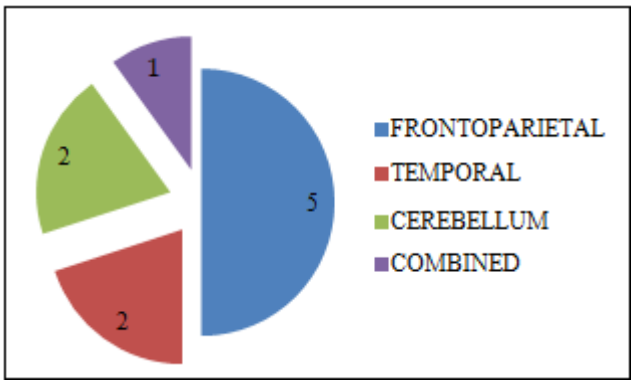
Distribution according to Site:

The infective lesions were majorly found in the supratentorial region.

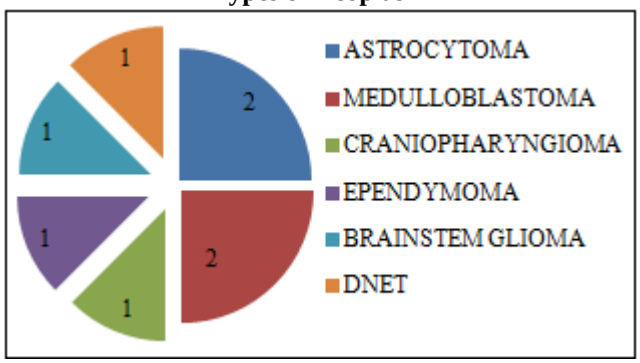
Tumors were found majorly in the infratentorial region



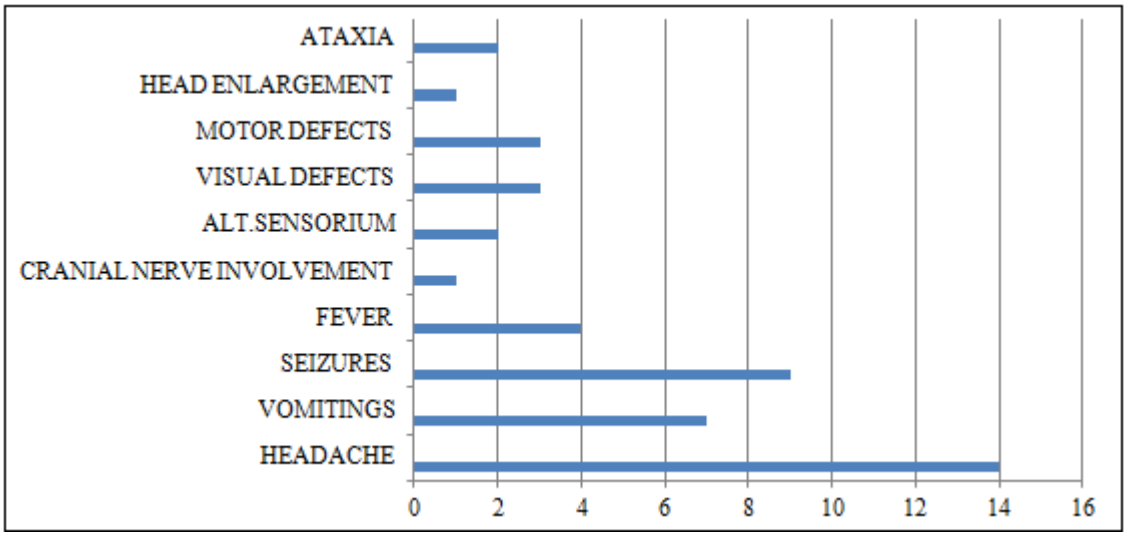
Location of Tuberculomas



Types of Neoplasm

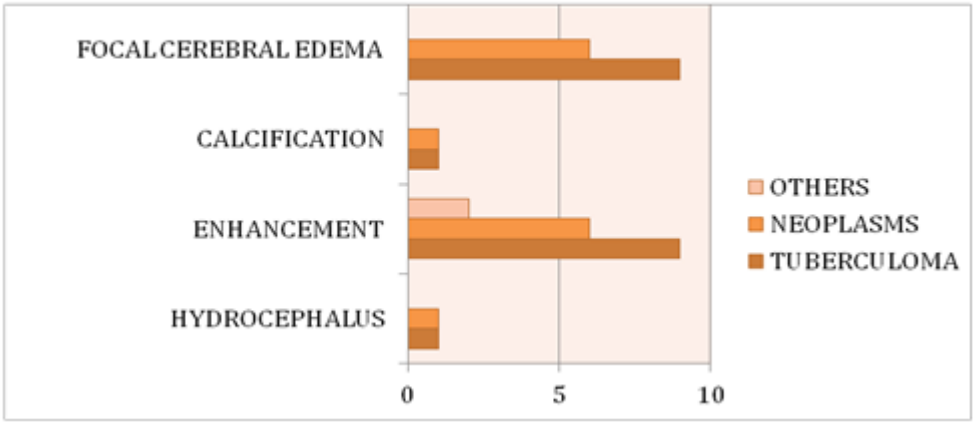


Clinical Features

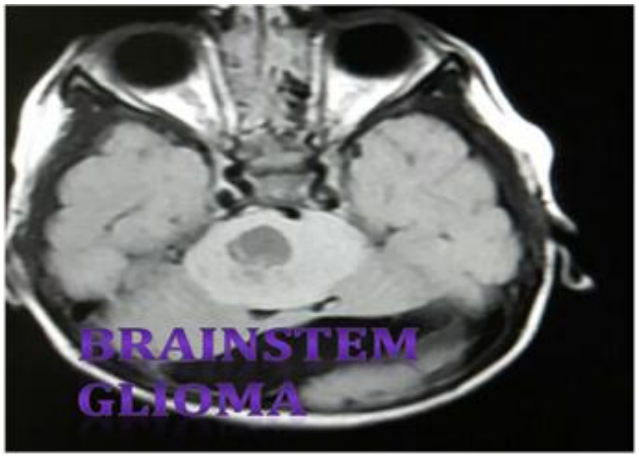


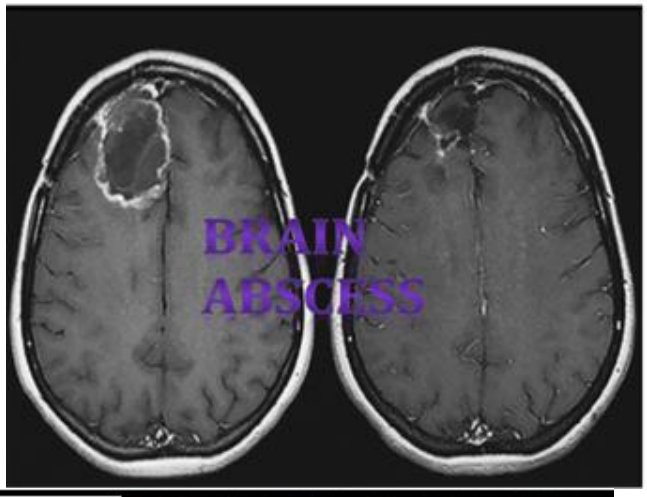
Tuberculomas are most commonly associated with headache and seizures, whereas neoplastic space-occupying lesions are most commonly associated with headache, vomiting, ataxia, and visual deficits.

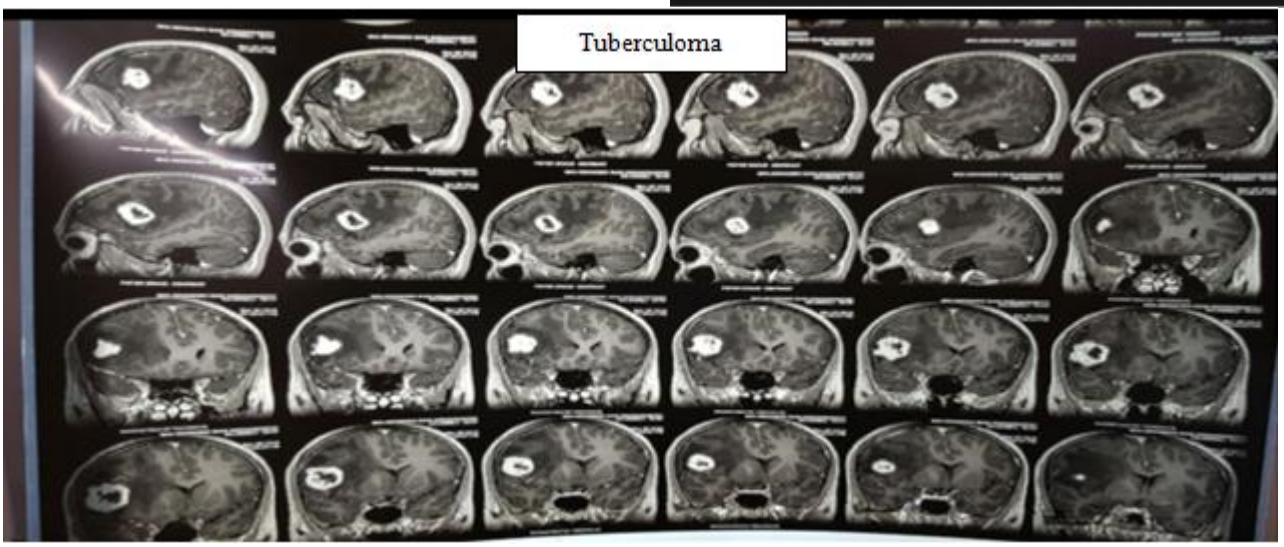
RADIOLOGICAL FINDINGS IN ICSOL



- CT scan findings in Tuberculomas showed ring enhancement in 70%, nodular enhancement in 30%, calcification in 10 %, and focal cerebral edema in 90 % of cases.
- CT scan findings in Brain neoplasms showed enhancement in 75%, calcification in 12.5 % (Craniopharyngioma), and focal cerebral edema in 75%.







4. Discussion

- It was observed that the incidence of Tuberculoma was 10, the neoplasm was 8, brain abscess 2, and arachnoid cyst 1 among the 21 cases.
- In the present study, infective lesions like tuberculomas and Brain abscess.[3] are the predominant lesions constituting 57.1%, whereas the incidence of brain tumors was 38.1 %, thereby, whenever a case of ICSOL attends the ward, one must evaluate completely to identify treatable conditions like Tuberculomas and brain abscess.
- When the present study regarding the incidence of tuberculomas.[4] was compared with the incidence of other authors, it was in correlation with the study of Prajapati et al.
- since it is a short-term study it may not be considered as a true incidence.
- The incidence of brain tumors in the present study was 38.1%, which was in correlation with the study of Rashmi Tanvi et al., where the incidence was 34.72%.

It is observed that children in the age group 6-10 years are more vulnerable to developing ICSOL, both infective and noninfective therefore any child over the age of 5 years who present with unexplained seizures, signs of raised ICT, focal neurological deficits, visual disturbances should be investigated preferably with C.T scan to rule out ICSOL.

Management

Tuberculomas – all 10 cases were treated with ATT, out of which 6 cases required surgical intervention. One case required Ventriculoperitoneal shunt due to associated meningitis with hydrocephalus.

Neoplasm's – Out of 8 cases 7 cases were treated surgically, the remaining one case was treated by chemotherapy and radiotherapy.

Brain Abscess –2 cases of cerebral abscess in the study group treated by drainage and with antibiotics.

Arachnoid cysts – 1 case of arachnoid cysts in the study group, was operated by excision.

References

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