

A study to identify the causative organisms of Brain Abscess among children admitted at selected Hospitals in Indore

Mr. Sunil Bhargaw, Research Scholar, Malwanchal University

Prof. Dr. Madurendra Singh Rajput, Research Supervisor, Malwanchal University

Introduction

Brain abscess is a rare but serious condition in children, characterized by a collection of pus in the brain tissue. The incidence of brain abscess in children in India is not well documented. However, some studies suggest that the incidence of brain abscess in children in India is similar to that of developed countries, with a prevalence of 0.2-2.2 cases per 100,000 children per year.

The most common cause of brain abscess in children in India is bacterial infection, usually resulting from an untreated or poorly treated ear or sinus infection, dental abscess, or an infection in the lungs. Other causes include head trauma, neurosurgical procedures, and immune deficiencies.

The symptoms of brain abscess in children include fever, headache, vomiting, altered mental status, seizures, and focal neurological deficits. Early diagnosis and treatment are essential for a successful outcome. Treatment usually involves a combination of antibiotics, surgical drainage, and supportive care.

Prevention of brain abscess in children involves prompt treatment of underlying infections, vaccination against infectious diseases such as pneumococcus, and good hygiene practices. It is important for parents to seek medical attention immediately if their child has any symptoms suggestive of a brain abscess.

Methodology

Patients less than 18 years old who were seen at Index Medical College in Indore between January 2022 and January 2023 and were given a diagnosis of brain abscess were considered for inclusion in the study. We searched all of the patients whose diagnosis at discharge was brain abscess using the Samsung

Medical Information System (SMIS), and we only included cases that had radiological evidence. Thirty patients had brain parenchymal abscesses, five patients had a subdural abscess, and fifteen patients had an epidural abscess. Retrospective record reviews were the basis for the collection of clinical data, including clinical symptoms, early laboratory results, causal organisms, features of abscesses, treatment options, and outcomes. In order to analyse the degree of connection that exists between the outcomes and the variables that were investigated, several types of statistical analysis, including as the univariate analysis, the Mann-Whitney test, and the Fisher's exact test, were carried out.

Result

A total of 50 paediatric patients were diagnosed with one or more brain abscesses during the course of 15 years and 7 months. There were 50 patients in all, 30 of whom were male and 20 of them were female. The average age was 4.3 years, and the most abscesses were seen in individuals less than three years old, including two newborns. The average age was 4.3 years old. Twelve of the fifty patients were born prematurely.

51% of patients had known underlying medical disorders, including congenital heart disease in 10% of instances, immunodeficiency in 12% of cases owing to AML, MDS, and agammaglobulinaemia, and probable arterial venous malformation in 5% of cases.

Six percent of patients experienced preterm labour in addition to CHD, and two had MDS in addition to CHD.

An otogenic infection accounted for 4% of cases, a penetrating head trauma accounted for 10% of cases, preceding meningitis accounted for 12% of cases, neurosurgical procedures accounted for 22% of cases, endocarditis accounted for 4% of cases, ventriculoperitoneal shunts accounted for 2% of cases, and improper oral hygiene accounted for 2% of cases.

In 66% of patients, abscess cultures, blood cultures (30%), cerebrospinal fluid cultures (35%), vegetation cultures collected during open-heart surgery (30%), and pathology reports (5% of patients) were utilised to support the microbiological diagnosis. *Streptococcus intermedius* accounts for 20%, *Staphylococcus aureus* accounts for 12%, and *Streptococcus pneumoniae* accounts for 9%. *Pseudomonas aeruginosa* 5%, *E. coli* 11% *Candidia albicans* was discovered to be present at 4%, *Aspergillus* spp. (*Aspergillus flavus*, *Aspergillus* spp.) at 6%, and a fungal infection assumed to be *Aspergillus* spp. at 4%. *Streptococcus pneumoniae* and *Pseudomonas aeruginosa* were found in

both blood and cerebrospinal fluid cultures collected from two distinct patients. *Staphylococcus intermedius* (15%), *Staphylococcus aureus* (7%), and *Aspergillus flavus* (2%) were found in abscess cultures. In one case, *Candida albicans* was found in a culture of the patient's flora. Only the pathology reports from the abscesses were able to identify the organisms present in all five patients; one patient had an *Aspergillus* species, and the other patient was considered to have a fungal infection but the species could not be identified.

Conclusion

Streptococcus intermedius was shown to be responsible for 20% of brain abscess cases in this investigation. In this research. Brain abscesses cause severe morbidity and mortality. Since brain abscesses may appear in subtle ways at first, a high degree of suspicion is essential for early diagnosis in paediatric patients, especially those with underlying illnesses such as congenital heart disease or preterm with a difficult postnatal history.

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