

## ORIGINAL RESEARCH

# A Study to Assess Incidence of Brain Abscess in Different Age Groups and Gender Population: An Institutional Based Study

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### ABSTRACT

**Background:** Brain abscess is an intraparenchymal collection of pus. It can occur due to spread of infection from a contiguous focus, hematogenous seeding from a distant source, as a sequelae of head trauma or neurosurgical procedure. The present study was conducted to assess incidence of brain abscess in patients coming to the department of Neurosurgery.

**Materials & Methods:** The present study was conducted to assess incidence of brain abscess in patients coming to the department of Neurosurgery over a period of one year. All patients suspected of having brain abscess on basis of clinical history, CT scan and MRI, of all groups and genders were included in the study. The collected data were analysed using SPSS version 16.0 software.

**Results:** In the present study 410 patients were reported to the department in which 50 patients were included based on history, examination and investigations were done. The total incidence of brain abscess was 12.19%. The brain abscess was prevalent in males (56%) than females (44%). The brain abscess was more common in age group 31-40 years followed by age group 18-30 years.

**Conclusion:** The study concluded that the total incidence of brain abscess was 12.19%. The brain abscess was prevalent in males than females. The brain abscess was more common in age group 31-40 years followed by age group 18-30 years.

**Keywords:** Brain Abscess, Incidence, Age Group, Gender.

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### INTRODUCTION

A brain abscess is an intraparenchymal collection of pus in the brain. The incidence of brain abscess among intracranial masses varies from 1-2% in western countries, to about 8% in developing countries.<sup>1</sup> A brain abscess is a focal, intracerebral infection that begins as a localized area of cerebritis and develops into a collection of pus surrounded by a well-vascularized capsule.<sup>2</sup> It can occur due to spread of infection from a contiguous focus, hematogenous seeding from a distant source, as a sequelae of head trauma or neurosurgical procedure.<sup>3</sup> In 25% of cases, an etiology cannot be identified.<sup>4</sup> The causative pathogen can vary from Gram positive cocci (*Staphylococci*, *streptococci*

*Peptostreptococcispp*), Gram negative bacilli (*Klebsiella*, *Escherichia coli*, *Salmonella*, *Bacteroides*, *Haemophilus*, and *Proteus spp*).<sup>5</sup> Fungal infection, Toxoplasma are found in immunocompromised patients with HIV infection, organ transplantation, chemotherapy and prolonged steroid usage.<sup>6</sup> Clinical presentation of brain abscess depends on multiple factors including location of lesion, pathogenic organism and host immune status. It commonly presents with either a mass lesion with focal neurological deficit or raised intracranial hypertension due to diffuse cerebritis.<sup>7</sup> Recently, newly diagnostic procedures, such as brain imaging techniques (i.e., magnetic resonance imaging [MRI] and computed tomography [CT]) and

stereotactic biopsy, as well as administration of new antibiotics have considerably changed the management and outcome of patients with BA. The mortality of BA has declined from 40% in 1960 to 10%–20% during the past decade. Unfortunately, many survivors continue to suffer from neurological deficits.<sup>8</sup> The present study was conducted to assess incidence of brain abscess in patients coming to the department of Neurosurgery.

## MATERIALS & METHODS

The present study was conducted to assess incidence of brain abscess in patients coming to the department of Neurosurgery over a period of one year. All patients suspected of having brain abscess on basis of clinical history, CT scan and MRI, of age group below 18 years to 50 years and both genders were included in the study. Relevant history, examination and investigations were done in all patients. All patients received intravenous antibiotics with proper neurosurgical consultation and intensive care support when it was required. Following investigations were performed: Complete blood count, blood culture sensitivity for aerobic, anaerobic and fungal infections, aspirated pus culture sensitivity after burr hole aspiration and craniotomy, Digital X-ray chest, 2D-ECHO (in case of congenital heart disease), serum Immunological profile (IgA, IgG, IgM, IgE). Patients were managed depending on their condition. Neurosurgical opinion was taken for aspiration. Patients with following condition required surgical drainage (burr hole aspiration or craniotomy): multiple abscess, abscess causing significant midline shift on neuro-imaging, posterior fossa abscess, suspected fungal abscess and air fluid level in abscess. At time of discharge, all patients underwent detailed neurological examination. The collected data were analysed using SPSS version 16.0 software.

## RESULTS

In the present study 410 patients were reported to the department in which 50 patients were included based on history, examination and investigations were done. The total incidence of brain abscess was 12.19%. The brain abscess was prevalent in males (56%) than females (44%). The brain abscess was more common in age group 31-40 years followed by age group 18-30 years.

**Table 1: Incidence of brain abscess according to gender**

Gender	N(%)
Male	28(56%)
Female	22(44%)
Total	50(100%)

**Table 2: Incidence of brain abscess according to age**

Age groups (yrs)	N(%)
>18 years	5(10%)

18-30 years	17(34%)
31-40 years	19(38%)
41-50 years	9(18%)
Total	50(100%)

## DISCUSSION

Brain abscesses increase mortality rates and prolong hospitalization, that pose diagnostic and therapeutic challenge to both neurologists as well as microbiologists. Most of the time the clinical presentation of patients with brain abscess are atypical, only a few presents with the classical triad of headache, fever, and focal neurological deficits.<sup>9</sup> Many a times even radiological features could be misinterpreted as brain tumors.<sup>10</sup>

In the present study 410 patients were reported to the department in which 50 patients were included based on history, examination and investigations were done. The total incidence of brain abscess was 12.19%. The brain abscess was prevalent in males (56%) than females (44%). The brain abscess was more common in age group 31-40 years followed by age group 18-30 years.

The incidence of BA was 3–5 per million population-years in a study conducted in Northern Ireland<sup>11</sup>, which identified BA cases based on pathology and excluded patients with abscesses smaller than 15 mm in diameter. A more recent investigation conducted in Olmsted County in Minnesota showed a decline in the incidence of BA from 2.7 per 100,000 persons during 1935–1944 to 0.9 per 100,000 persons during 1965–1981.<sup>12</sup> However, these studies were performed over 20 years ago in Western countries.<sup>11,12</sup>

McClelland et al. (1978) found that this disease occurs most often in the middle decades of life.<sup>13</sup> Sinha et al. (2003) reported 74.89 % of their patients were below 20 years of age.<sup>14</sup> A brain abscess in neonates and infants is a rare condition, but there are occasional reports of brain abscess in infants documented in the literature.<sup>15,16</sup> Menon S et al undertook a comprehensive study to determine the demographics and bacteriological spectrum of brain abscesses in our hospital. The study concluded that brain abscess could develop at any age but there was a preponderance of males over females. Chronic suppurative otitis media was the most common predisposing factor for temporal lobe infections. Forty-one (54.70 %) abscesses were found to be due to pyogenic organisms, 4 % due to Mycobacterium tuberculosis and 1.3 % were due to Cladophialophorabiantiana. The majority of microbial isolates were sensitive to the therapeutic regime adopted in our neurosurgery unit (cefotaxime, gentamicin and metronidazole). Chloramphenicol is another antibiotic with in vitro activity against the isolates.<sup>17</sup>

## CONCLUSION

The study concluded that the total incidence of brain abscess was 12.19%. The brain abscess was prevalent in males than females. The brain abscess was more common in age group 31-40 years followed by age group 18-30 years.

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