Clinicopathological study of otogenic brain abscess

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Abstract Chronic suppurative otitis media (CSOM) is one of the commonest disease entities encountered in otolaryngology practice. Due to poor economic conditions poor hygiene lack of education and death of knowledge about the disease and its complications, we frequently encounter patients of CSOM with extracranial and intracranial complications. Among the intracranial complications otogenic brain abscess is one of the dreadest. With the improvement of healthcare and accessibility of the poor people to healthcare system and development of CT scan, MRI as diagnostic tools incidence of otogenic brain abscess is becoming less due to early diagnosis and interventions. The objectives of this study are to assess the incidence of brain abscesses to explore age, sex, variation to study clinical presentations and common pathogens responsible.

Keywords Chronic suppurative otitis media · Brain abscess

Introduction

Brain abscess is a focal suppurative process in the brain parenchyma. Significant percentage of brain abscesses are of otogenic origin. Otogenic brain abscess almost always develop in the temporal lobe area [1, 3, 5] in or in the cerebellum region [2, 7]. In childrens 25% of all brain [4, 6, 8] abscesses are otogenic, while in the adults the incidence of brain abscess is >50% due to chronic ear diseases. For some unknown reasons otogenic intracranial complications occurs predominately in males. As a rule, otogenic brain abscesses are single and multiple only in rare cases. Incidence on otogenic brain abscesses are becoming less due to early diagnosis and interventions. Conventionally it is well accepted that Chronic suppurative otitis media (CSOM) with cholesteatoma are always unsafe; but in some cases of CSOM were the ear is regarded as safe mat also lead to intracranial complications including brain abscesses. It seems pertinent to avoid complacency in any ear with active discharge regardless of the tympanic membrane defect, and no ear infected can be regarded as completely free from the risk of life-threatening complications.

Aims and objectives

1. To study the incidence of brain abscesses in relation to otitis media.
2. To explore age and sex variation along with relationship to socioeconomic status.
3. To study clinical presentations in relation to site and nature of abscesses.
4. To study common pathogens responsible.

Materials and methods

Cases had been selected from patients attending ENT OPD in IPGMER & SSKM Hospital, Kolkata during the period between May 2006 to April’ 2007. Patients
attending ENT OPDs who were suffering from CSOM with intracranial complications was selected initially and those patients having CT scan or MRI with feature of brain abscess were finally selected for present study. A detail history was taken in every case and special emphasis was given on history-related to features of intracranial complications. Past history of otogenic meningitis and brain abscesses with or without, surgical intervention were also ask for. A thorough examination of ear, nose and throat were performed for each case. Presence of any attic perforation or postero-superior retraction pocket with or without cholesteatoma were searched. Fistula test, was done in every cases. Neurological examinations were performed, consciousness, neck rigidity, Kernig’s sign [1, 4], cerebeller signs [3, 7], cranial nerve examinations [1, 3, 8], muscle power and tone, plantar reflex and jerks, papillary reactions, nystagmus, ophthalmoscopy, speech, gait, etc. were looked for. Selected patients underwent otomicroscopy, CT Scan of brain, MRI of brain (in selected case), hematological and audiological investigations [7]. Sensitivity of CT Scan is >95% in detecting brain abscesses. Without contrast administration a brain abscess typically appear as a hypodense lesion, surrounded by a uniformly enhancing ring and a variable hypodense are of edema extending beyond the ring in CT scan. MRI is extremely sensitive in detecting focal of diffuse parenchymal lesions (like brain abscess) and it appear to be more sensitive than CT scan at detecting brain abscesses in cerebritis phase of its development. Pus from ear and also aspirated pus from brain abscesses were routinely send for culture and sensitivity.

Results

In this study 16 cases of otogenic brain abscess were studied and evaluated. The results were compared with informations obtained by review of literature of the previous workers. Total number of patients attending the ENT OPD in the study period (May 2006–April 2007) was around 65,000 and total number of cases of otogenic brain abscesses in this study are 16. So the incidence of otogenic brain abscess is 0.25 in 100. Annual risk of otogenic brain abscess of a patient suffering from chronic otitis media comes around 0.98 in 1,000.

Among the selected 16 patients 13 were male (81.25%) and 3 were female (18.75%) (Fig. 1). In this study patients in their second decade of life had suffered the most. The incidence in 11–20 years is 43.75% (Fig. 2). Most of the patients in this study had prolonged history of aural discharge in the ipsilateral ear due to chronic suppurative otitis media. Poor socio-economic status, illiteracy and lack of consciousness are important determinants for intracranial complications of CSOM. In this study 9 patients (56.25%) were below poverty line. Five patients were from lower middle class income group (31.25%) and rest 2 patients (12.50%) were from middle class income group. Among the 16 patients 9 patients came from urban areas and 7 patients came from rural areas. But most of the patients were coming from urban slum areas. One interesting findings in this study is the distribution of the patients according to the history of pond bathing: out of 16 patients 12 patients had history of pond bathing and 4 patients had no history of pond bathing. Most of the patients give history of aural discharge, which was initially muco postero-superior purulent in nature and later became scanty and foul smelling. In this study 15 out of 16 cases had single brain abscess and only 1 patient had multiple brain abscesses. Regarding the site of perforation in the tympanic membrane 10 patients had only attic perforations, 3 patients had only postero-superior marginal perforations, 2 patients had postero-superior retraction pockets and 1 patient had combination of attic and postero-superior marginal perforations.

All patients underwent radical mastoidectomy and cholesteatoma was found in all the cases. Among the 16 patients 9 cases had cerebellar abscesses, 4 cases had temporal abscesses and 3 cases had temporo-parietal abscesses. Regarding the clinical presentations of otogenic brain abscesses there were many signs and symptoms found in the patients. Headache, nausea, vomiting, hearing loss were found in all of the cases. Other features were fever (75%), altered sensorium (50%), generalized weakness (100%), altered speech (43.75%), convulsion (37.5%), focal neurologic symptoms (25%), nystagmus (12.5%), neck rigidity (50%), Kernig’s sign (18.75%), hypotonia (81.75%), cerebellar sign (37.5%), photophobia (50%), hemiparesis (8.75%).

Among the 7 patients who had temporal/ temporo-parietal lobe abscess, 3 patients presented with altered sensorium and among the 9 patients who were presented with cerebellar abscess, 5 patients presented with altered sensorium. All patients with otogenic brain abscess presented in the third stage of development of brain abscess; so most of the patients had some form of localizing signs. Among the 16 patients only 2 patients had positive culture reports of the past aspirated from brain abscesses and 14 patients had sterile abscesses. Only 1 patient had died in the 3rd postoperative day, so mortality rate was 6.25%. all the 16 patients had initial 10–14 days of conservative treatment followed by radical mastoidectomy. In most of the cases cholesteatoma and granulation tissues were found with evidence of bone destruction in the form of dehiscent tegmen tympani, posterior cranial fossa dura of sinus plate were found. CT scans with contrast enhancement were done in every case. Abscesses with typical ring enhancement were found in most of the cases. Only 2 patients could afford MRI scan and the parenchymatous lesions were delineated in the MRI scan excellently.