CHRONIC SUPPURATIVE OTITIS MEDIA: CLINICAL PRESENTATION OF INTRACRANIAL COMPLICATIONS IN A RURAL AREA

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ABSTRACT: INTRODUCTION: Chronic suppurative otitis media (CSOM) remains one of the most common childhood chronic infectious diseases worldwide. Microbial, immunological, and genetically determined factors, Eustachian tube characteristics, are supposed to be involved in the pathogenesis of CSOM. The objective of this study was to describe the clinical presentation of intracranial complications of chronic suppurative otitis media in a rural area of Anwarpur, Hapur.

MATERIALS AND METHODS: Patients suffering from CSOM attending outpatient department of Ear, Nose and Throat Department of Saraswathi institute of medical Sciences, anwarpur, Hapur from 2012 to 2015 were included in this study. All admitted cases of intracranial complications due to chronic suppurative otitis media of any age and gender were included. Cases of intracranial complications due to acute suppurative otitis media were excluded from the study. After confirmation of complications by computed tomography, a multidisciplinary approach was followed, including initial treatment by intravenous systemic antibiotics to the definitive final treatment of mastoid surgery. RESULTS: Out of the 50 reported cases of csom with intracranial complications the age of patients ranged from 10 to 70 years, with majority, about 42%, being between 10-25 years of age. Male predominance was (62%).Majority of patients belonged to (69%) poor socioeconomic status. Otorrhoea (92%) was the commonest presentation. Perforation of the tympanic membrane was seen in in 80% cases, while only 64% cases were marginal or attic perforation. Meningitis (50%) is the commonest intracranial complication of chronic suppurative otitis media followed by brain abscess (temporal lobe abscess).

CONCLUSIONS: Meningitis (50%) is the commonest intracranial complication of chronic suppurative otitis media followed by brain abscess which was found to be 24% (temporal lobe abscess was seen in 16%). In this era of antibiotics, a high degree of clinical suspicion with a proper investigation, followed by a prompt surgical intervention, gives good results in the cases of intra cranial complications associated with cases of CSOM. The rate of complications, especially more serious intracranial complications, observed in developing countries is significantly more than those observed in studies from the developed countries.

KEYWORDS: Suppurative otitis media, Meningitis, Brain abscess, Sinus thrombosis.

INTRODUCTION: Chronic suppurative otitis media (CSOM) is defined as chronic otorrhoea (>12 weeks) through a perforated tympanic membrane. The cycle of infection, inflammation, granulation tissues, polyp and cholesteatoma formation continues, destroying surrounding bony margins and ultimately leading to the various complications of CSOM. Slattery WH.[¹]

Both aerobic and anaerobic bacteria are found in chronic discharging ears. Pseudomonas aeruginosa, Staphylococcus aureus, Klebsiella, Proteus, and E. coli species are the predominant.
bacterial etiology. Despite the availability of newer antibiotics, CSOM can still lead to major complications in developing countries. Prakash R, et. al.[2]

The formation of biofilm facilitates chronic bacterial infections and reduce efficacy of anti-microbial therapy. It is estimated that biofilm account of approximately 60% of microbial infection in the body. In addition to bacterial biofilm, role of fungal infections in CSOM needs more attention. Fungal infections of middle ear are common as fungi thrive well in moist pus. Abdelshafy IA, et. al.[3]

CSOM with cholesteatoma can spread beyond middle ear, leading to extra cranial and intracranial complications. Various intracranial complications of CSOM are meningitis, extra- dural abscess, sub-dural abscess, brain abscess, sigmoid sinus thrombosis, and otitic hydrocephalus. The objective of this study was to describe the clinical presentation of intracranial complications of CSOM and various ontological surgical procedures in management of these complications.

MATERIAL AND METHODS: This study was conducted at Department of ENT, SIMS, Hapur from 2012 to 2015. A written informed consent containing terms about inclusion in study, benefits and risks involved, was obtained from each patient. Cases of intracranial complications due to acute suppurative otitis media were excluded from the study. A thorough history was taken and detailed otological, neurological, ophthalmological, and general physical examination was carried out and recorded on a proforma. Pure tone audiogram, CT-Scan of brain & temporal bone were done in all patients. The Computerized Tomography (CT) scan and MRI is the main-stay of the investigations. In our study, all the patients underwent HRCT scan of the brain and temporal bone, with fine cuts of the temporal bone and a contrast enhancement. Every patient on admission was put on intravenous broad spectrum antibiotics and steroids to reduce cerebral edema. Selection of surgical procedure on ear was done according to the type and extent of disease. Patients with persistent disease and recurrent foul smelling otorrhoea, marginal and attic perforation, and cholesteatoma were selected for mastoid exploration.

RESULTS: Out of the 50 reported cases of csom with intracranial complications the age of patients ranged from 10 to 70 years, with majority, about 62%, being between 10-25 years of age. Male predominance was (62%). Majority of patients belonged to (69%) poor socioeconomic status.

| Sl. No. | Symptoms        | No of Patients | %  |
|--------|-----------------|----------------|----|
| 1      | Otorrhoea       | 46             | 92 |
| 2      | Decreased hearing | 38          | 76 |
| 3      | Fever           | 24             | 48 |
| 4      | Headache        | 20             | 40 |
| 5      | Vertigo         | 8              | 16 |
| 6      | Seizures        | 6              | 12 |

| Sl. No. | General Signs     | No. of Patients | %  |
|--------|------------------|-----------------|----|
| 1      | Raised temperature | 24             | 48 |
| 2      | Kernings/ Brudzinski sign | 22           | 44 |
| Sl. No | Otologic Sign          | No. of Patients | %  |
|-------|------------------------|----------------|----|
| 1     | Cholesteatoma          | 42             | 84 |
| 2     | Granulation tissue     | 28             | 56 |
| 3     | Attic perforation      | 32             | 64 |
| 4     | Polyp                  | 18             | 36 |

| Sl. No | Intracranial Complications | No. of Patients | %  |
|--------|----------------------------|----------------|----|
| 1      | Meningitis                 | 25             | 50 |
| 2      | Brain abscess              | 12             | 24 |
| 3      | Extra dural abscess        | 6              | 12 |
| 4      | Lateral sinus thrombosis   | 4              | 8  |
| 5      | Otitic hydrocephalus       | 3              | 6  |

Table 1

Graph 1

Graph 2
DISCUSSION: Otitis media (OM) is one of the most common medical problems of childhood. In the pre-antibiotic era, there was significant incidence of mastoiditis and intracranial complications (ICC) caused by otitis media, which presented high rate of mortality. After the introduction of antimicrobial agents, there has been a reduction in the incidence from 2.3% to 0.04%. However, nowadays, intracranial complications still represent a situation of risk given that mortality rate is high, reaching 36%. MIURA, Mauricio. et. al.[4] An increase in the reported complications of CSOM can be attributed to the rise of antibiotic resistant rates and the of cases with immunodeficiency (diabetes mellitus, AIDS, use of steroid etc)

A complication of otitis media is defined as a spread of infection beyond the pneumatized area of the temporal bone and the associated mucosa. Complications of otitis media may be divided into intratemporal and extratemporal. The former include tympanic membrane perforation, conductive or sensorineural hearing loss, ossicle lesions, facial palsy, mastoiditis, labyrinthitis and petrosis. Extratemporal complications are subdivided into intracranial (abscess of the central nervous system, meningitis, lateral sinus thrombophlebitis and otic hydrocephalus) and extracranial complications (retroauricular, zygomatic and Bezold abscess) .The following signs or symptoms is suggestive of intracranial complications:

a) Fever associated with a chronic perforation.

b) Lethargy.

c) Focal neurologic signs (eg, ataxia, oculomotor deficits, seizure).

d) Papilledema.

e) Meningismus.

f) Altered mental status.

g) Severe headaches.

h) Foul smelling discharge and hearing loss were the most common presenting symptoms.

Pennybacker et al., in 1961, reported 200 cases of ICC: they found 85 cases of temporal lobe and cerebellum abscess, 28 cases of otic hydrocephalus, 13 cases of meningitis, and 8 cases of lateral sinus thrombosis. Pennybacker J. et. al.[5]

Kuczkowski and Mikaszewski reported 503 cases of ICC (372 by COM and 131 by AOM); 80.7% of ICC were isolated and 19.3% were multiple. The most common ICC was meningitis with 177 cases (35.2%), extradural abscess with 122 cases (24.2%), cerebral abscess with 64 cases (12.7%), lateral sinus thrombosis with 90 cases (17.9%), cerebellum abscess with 35 cases (7.0%), hydrocephalus with 14 cases (2.8%), cavernous sinus thrombosis with 1 case (0.2%). Kuczkowski. et. al.[6]

In our study Meningitis was the commonest intracranial complication of CSOM seen in 50% cases followed by brain abscess (24%). Presence of cholesteatoma is the most important feature in association with aural polyps and granulation tissue.

Extra dural abscess was seen in 12% of the cases.

Lateral Sinus Thrombosis (LST) is a rare complication and was seen in 8% of the cases. Lateral sinus thrombosis occurs by bone erosion of the mastoid over the sinus owing to the presence of cholesteatoma, granulomatous processes or coalescence, which form a perisinusal abscess. There may be high fever, retroauricular pain, thickness of perisinusal region,
sternocleidomastoid muscle pain and papilla edema. CT scan shows the classification of delta sign by dura in cases of lateral sinus thrombosis, confirming the diagnosis Lubianca Neto JF.[7]

Otic hydrocephalus is the increase of intracranial pressure without affection of the CSF. In our study otic hydrocephalus was seen in 6% of the cases. The patient may present with headache, 6th cranial nerve palsy, reduction of attention, lethargy, diplopia, nausea/vomiting and papilla edema. Treatment is based on intravenous antibiotics and mastoidectomy. Intracranial hypertension is handled by systemic corticoids.[4]

Cholesteatoma, granulation tissues and attic perforation were the common otological findings in the study patients. Cholesteatoma was present in 80% of the patients studied by Ajmal. et. al[8] as compared to 68.57% by Asmatullah Khan. et. al[9] In our study cholesteatoma was wound in 84% of the cases followed by granulation tissue in 56% cases and attic perforation in 64% cases.

CONCLUSIONS: Meningitis is still the commonest intracranial complication of CSOM followed by brain abscess. Presence of cholesteatoma is the most important feature and when present in association with aural polyps and granulation tissue it is likely to lead to severe intracranial complications. CT Scan is the most relevant investigation in establishing diagnosis and follow-up. Early surgical intervention in combination with broad spectrum antibiotics provides a good outcome. Pneumococcal vaccination is recommended for the elderly patients who are treated conservatively. The rate of complications, especially more serious intracranial complications, observed in developing countries is significantly more than those observed in studies from the developed countries.

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