

COMPLICATIONS OF CHRONIC SUPPURATIVE OTITIS MEDIA

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OBJECTIVE

The aim of the study was to find the complications of chronic suppurative otitis media.

MATERIAL AND METHODS

The study was descriptive study conducted from 1st January 2008 to 31 December 2010 (3 years duration) at ENT department Khyber Teaching Hospital Peshawar. Total 250 patients of all age having complications due to chronic suppurative otitis media enrolled from admitted patients in ENT department Khyber Teaching Hospital Peshawar were included in the study, using convenience (non-probability) sampling.

RESULTS

In total of 250 patients, all (100%) were having history of discharging ear, decreased hearing 250 (100%), earache in 75 (30%), fever in 31 (12.4%), headache in 28 (11.2%), nausea and vomiting in 23 (9.2%) patients. The extracranial complications were found in 204/250 (81.6%) patients with mastoiditis being the most common in 155/204 (75.98%) patients followed by sensory neural hearing loss, post auricular abscess, facial paralysis, petrositis, labyrinthitis, Bezold's abscess and ceteri's abscess in 7.84%, 6.37%, 5.88%, 1.7%, 0.98%, 0.98% and 0.49% patients respectively. While the intracranial complications were found in 46/250 (18.4%) patients with meningitis being the most common in 28/46 (60.9%) followed by brain abscess in 26%, lateral sinus thrombosis in 8.7% and otitic hydrocephalus in 4.4% patients.

CONCLUSION

Early detection and treatment of complications as a result of chronic suppurative otitis is vital to prevent morbidity and mortality.

KEY WORD

Chronic suppurative otitis media, intracranial complications, extracranial complications

INTRODUCTION

Chronic suppurative otitis media is a long-standing infection (more than 12 weeks) of a part or whole of the middle ear cleft characterized by ear discharge and permanent tympanic membrane perforation¹. Complications of suppurative otitis media occur when infection spreads

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outside the confines of the bony walls of middle ear and mastoid spaces (middle ear cleft). Various routes for spread of infections include pathological bony defects (e.g. demineralization, bony erosion and granulation tissue), infected thrombus in veins (e.g. lateral sinus associated with cerebellar abscesses and superior

petrosal sinus with temporal lobe abscesses), normal anatomical pathways (e.g. oval round windows, cochlear and vestibular aqueducts), anatomical dehiscence (e.g. dehiscence over Jugular bulb, middle cranial fossa dura and facial nerve), non-anatomical bony defects (e.g. trauma and surgery/iatrogenic) and neoplasms. Once into the brain tissue infection can spread via Peri-arteriolar spaces of Virchow-Robin.² The complications of otitis media have been divided into intracranial and intratemporal (extracranial) complications³. The extracranial complications of chronic suppurative otitis media include mastoid abscess, discharging sinuses, purulent

labyrinthitis, Bezold's abscess, facial nerve paralysis and zygomatic abscess⁴. Cervical osteomyelitis may develop as a rare complication and present as a cause of severe neck pain in patients with otitis media⁷. Among the intracranial complications the most common is meningitis followed by brain abscess, epidural abscess, sigmoid sinus thrombosis, subdural empyema, perisinus abscess and transverse and cavernous sinus thrombosis⁶. Clinical features of intracranial complications include fever, lethargy, focal neurologic signs (e.g. ataxia, oculomotor deficits and seizure), papilledema, meningismus, altered mental status and severe headache. Clinical features of extracranial complications include fever, post auricular oedema or erythema, facial nerve paresis or paralysis, fetid otorrhea, retro-orbital pain on the side of the infected ear, vertigo, spontaneous nystagmus associated with sensorineural hearing loss and an infected ear.⁷ The complications and the morbidity of complications in children are more extensive than in adult group⁸. Symptoms can be no characteristics and must be asked for a CT in case of doubt; CT is of the first rank in diagnosis⁹.

The management of complications includes hospital admission, medical treatment and surgery. Medical treatment includes antibiotics (the combinations of third- or fourth-generation cephalosporin with chloramphenicol, vancomycin, metronidazole or aminoglycosides) to cover infection, vestibular suppressants for vestibular symptoms as well as anticonvulsant for seizures and anticoagulant (controversial) for thrombosis¹⁰. Surgical options include mastoid exploration to eradicate primary source of infection while the treatment of otogenic brain abscess initially involves aspiration or excision of the abscess through a temporal or sub-occipital route depending on its location followed by a mastoid exploration by the ENT surgeon to eradicate the primary source of infection¹¹.

MATERIAL AND METHODS

It was a cross sectional descriptive study of three years duration from 1st Jan 2008 to 31st Dec 2010, conducting in the ENT department of Khyber teaching hospital, Peshawar. Sample size was 250 patients, having complications (intracranial and extracranial) secondary to chronic suppurative otitis. All patients of either gender presenting with discharging ear for more than 6-12 weeks and perforated tympanic membrane diagnosed clinically as chronic suppurative otitis media with its complications of any age were included in the study. And excluding those patients with traumatic perforation of tympanic membrane and other causes of brain abscess, meningitis and facial nerve palsy

METHODOLOGY

The study was conducted after getting approval from hospital ethical and research committee. The patients meeting the inclusion criteria were included in the study through OPD/ER department. The diagnosis of complications of chronic suppurative otitis media was made by detail history taking, ontological and neurological findings followed by CT scan and CSF laboratory findings. The complications were divided into intracranial and extracranial (intratemporal), and percentage was calculated accordingly for all gender and ages. All the above-mentioned information including name, age, gender, address and telephone numbers were recorded on a pre-designed proforma. A strict inclusion criterion was followed to control confounders and bias in the study results. Data was entered into SPSS version 16. Descriptive statistics were used to calculate mean and standard deviation for age and duration of discharging ear with perforated tympanic membrane and otogenic brain abscess. Frequencies (%) were calculated for gender, presenting symptoms, examination findings and CT scan findings.

RESULTS

In total of 250 patients, 108 (43.2%) were 1-15 years, 64 (25.6%) were 16-30 years, 78 (31.2%) more than 30 years. Out of 250 patients 130 (52%) were male and 120 (48%) were female as shown in figure #1. In total of 250 patients all (100%) were having history of discharging ears, decreased hearing in 250 (100%), earache in 75 (30%), fever in 31(12.4%), headache in 28 (11.2%), nausea and vomiting in 23 (9.2%), altered conscious level in 25 (10%), neck rigidity in 13 (5.2%), focal neurological deficit in 5 (2%) and seizure 5 (2%) as shown in table #2. All the patients suspected of any extracranial and intracranial complications were further investigated by doing temporal region CT scan. In comparison, the extracranial complications in 204/250 (81.6%) were relatively more common as compared to the intracranial complications in 46/250 (18.4%) as shown in figure # 1.

In total of 204 extracranial complications, the most common one was mastoiditis in 155/204 (75.98%) patients followed by sensory neural hearing loss, post auricular abscess, facial paralysis, petrositis, labyrinthitis, Bezold's abscess and cecili's abscess in 16/204 (7.84%), 13/204 (6.37%), 12/204 (5.88%), 3/204 (1.7%), 2/204 (0.98%), 2/204 (0.98%) and 1/204 (0.49%) patients respectively as shown in table 3. Among the 46 intracranial complications the most common was meningitis in 28/46 (60.9%) followed by brain abscess in 12/46 (26%), lateral sinus thrombosis in 4/46 (8.7%) and otitic hydrocephalus in 2/46 (4.4%) patients as shown in table 4. The overall complications are shown in figure 2.

Table 1: Demographic features

Sex and age of patients	Number of patients	Percentages
Gender	Male	130/250
	Female	120/250
Age of patients	1-15 years	108/250
	16-30 years	64/250
	More than 30 years	78/250

Table 2: Clinical features

Features	Number of patients	Percentage
Ear discharge	250/250	100%
Decreased hearing	250/250	100%
Earache	75/250	30%
Fever	31/250	12.4%
Headache	28/250	11.2%
Nausea/vomiting	23/250	9.2%
Altered conscious level	25/250	10%
Neck rigidity	13/250	5.2%
Focal defect	5/250	2%
Seizure	5,250	2%

Figure # 1: Comparison of extra cranial and intracranial complications

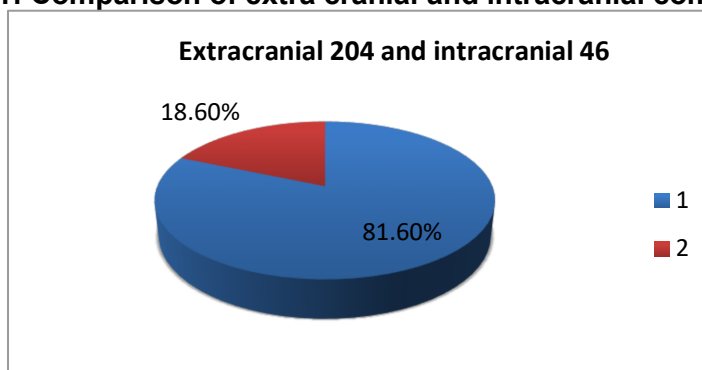


Table 3: Frequency of Extracranial Complications

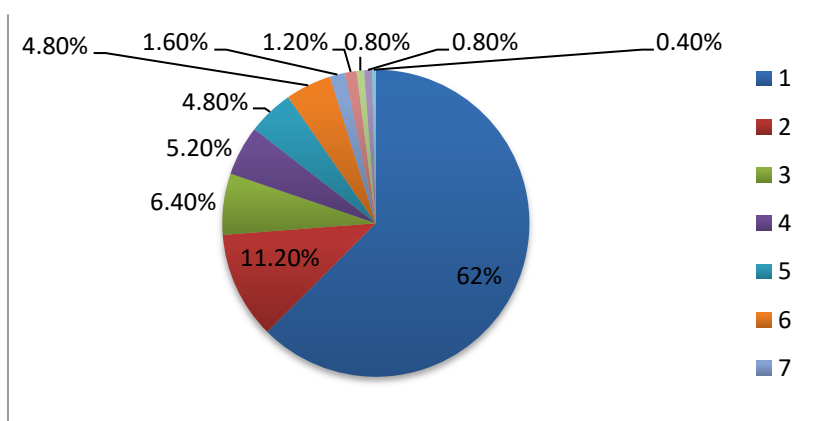
Extracranial complications	Number of patients/204	Percentage
Mastoiditis	155/204	75.98%
Sensory Neural Hearing Loss	16/204	7.84%
Post-Auricular Abscess	13/204	6.37%
Facial Paralysis	12/204	5.88%
Petrositis	3/204	1.47%
Labrynthitis	2/204	0.98%
Bezold's abscess	2/204	0.98%
Citelli's abscess	1/204	0.49%

Table 4: Frequency of Intracranial Complication

Intracranial Complication	Number of Patients/46	Percentage
Meningitis	28/46	60.9%
Brain Abscess	12/46	26%
Lateral Sinus Thrombosis	4/46	8.7%
Otitic Hydrocephalus	2/46	4.4%

Figure # 2: Relative frequency of complications in CSOM

1=mastoiditis, 2= meningitis, 3=SNHL, 4=postaural abscess, 5=facial paralysis, 6= brain abscess, 7= lateral sinus thrombosis, 8=petrositis, 9=labyrinthitis, 10=bezold's abscess, 11=otitic hydrocephalus, 12=citelli's abscess



DISCUSSION

Chronic suppurative otitis media is one the major middle ear infectious disease worldwide mostly occurs in children of low socioeconomic group¹². In a study by Dubey SP et al majority of patients having chronic suppurative otitis media with complications were under 18 years of age, with male twice that of female¹³. In our study majority of the patients 108 (43.2%) were 1-15 years, with 52% male. Chronic suppurative otitis media may cause serious intracranial and extracranial complication with high mortality and morbidity. In Finland the extracranial complications were in 97% while intracranial complications were 3%⁵. In Egypt, the ratio of extracranial to intracranial complications was nearly 1:1⁶. In our study the extracranial complications in 204 (81.6%) were relatively more common as compared to the intracranial complications in 46 (18.4%). In New Guinea, among the extracranial complications, 37% were mastoid abscess, 24% postauricular fistula and 14% facial palsy¹⁴. In China, facial paralysis was the commonest extracranial complication followed by suppurative labyrinthitis and periauricular abscess¹⁵. In our study, the most common extracranial complication was mastoiditis 62%, followed by sensorineural hearing loss 6.5%, the post auricular abscess 5.6% and facial nerve paralysis 5.2% while other like petrositis, labyrinthitis, Bezold's abscess and Citelli's abscess were relatively uncommon as 1.2%, 0.8%, 0.8% and 0.4% respectively.

In Turkey, the perisinus abscess was the most common intracranial abscess, followed by temporal lobe abscess, epidural abscess, cerebellar abscess and subdural empyema¹⁶. In Brazil otogenic brain abscess was most common followed by meningitis, lateral sinus thrombosis, subdural empyemas and epidural empyema¹⁷. In our study among the intracranial complications the most common was meningitis 11%, followed by brain abscess 4.8% and less common as lateral sinus thrombosis and otitic hydrocephalus as 1.2% and 0.4% respectively. Complication should be considered in any patient with chronic suppurative otitis media who is generally unwell and in particularly with symptoms such as pyrexia and headache. Early and effective management of complication is important. CT scanning is a reliable diagnostic tool for diagnosis of complications of chronic suppurative otitis media¹⁸. In our study we did CT scan in all cases with suspected complications. Surgeries were the main mode of treatment for majority of these conditions². In our study all such patients with complications due to chronic suppurative otitis media were treated first by medically and then surgically offering mastoid exploration to eradicate the primary cause. Patients with brain abscess were sent to neurosurgery department for aspiration of abscess followed by mastoid surgeries in ENT unit after full recovery.

CONCLUSION

Chronic suppurative otitis media causes extracranial/intracranial complications.

The mortality and morbidity due to these complications are preventable if early detected and treated.

Complications should always be considered in patients who have chronic suppurative otitis media presenting with headache, focal neurological deficit, seizures, nausea and vomiting.

CT scan is the investigation of choice for detection of complications in chronic suppurative otitis media.

RECOMMENDATION

Early detection and treatment of complications due to chronic suppurative otitis media are important in preventing morbidity and mortality.

REFERENCES

1. [Verhoeff M, van der Veen, EL, Rovers MM et al.](#) Chronic suppurative otitis media: a review. *Int J PediatrOtorhinolaryngol.* 2006; 70(1):1-1.
2. Y Robin. Complications of suppurative otitis media. *Disease of ears by Harold Ludman.* 6th Ed. 29 (398-399).
3. [Mostafa BE, El Fiky LM, El Sharnouby MM.](#) Complications of suppurative otitis media: still a problem in the 21st century. *ORL J OtorhinolaryngolRelat Spec.* 2009; 71(2):87-92.
4. [Paul CA, Kumar ARaut VV, Garhnam A, Kumar N.](#) Pseudomonas cervical Osteomyelitis with retropharyngeal abscess: an unusual complication of otitis media. *J Laryngol Otol.* 2005; 119(10):816-8.
5. [Leskinen K, Jero J.](#) Complications of acute otitis media in children in southern Finland. *Int J PediatrOtorhinolaryngol.* 2004; 68(3):317-24.
6. [Seven H, Coskun BU, Calis AB, Sayin I, Turgut S.](#) Intracranial abscesses associated with chronic suppurative otitis media. *Eur Arch Otorhinolaryngol.* 2005; 262(10):847-51.
7. [Wojcik K, Dalecka-Sztwiertnia E, Piekarska A, Zboinska J, Wrodycki W, Kuydowicz J.](#) Brain abscess: analysis of prevalence and clinical course. *PrzeglEpidemiol.* 2006; 60(2):265-71.
8. [Hossain MM, Kundu SC, Haque MR, Shamsuzzaman AK, Khan MK, Halder KK.](#) Extracranial complications of chronic suppurative otitis media. *Mymensingh Med J.* 2006; 15(1):4-9.
9. [Liang X, Chen S, Ou Y, Zheng Y, Ding J, Xu Y, et al.](#) Clinical analysis of chronic suppurative otitis media in adults and children. *Lin Chuang Er Bi Yan HouKeZaZhi.* 2005; 19(13):594-5.
10. [Migirov L, Duvdevani S, Kronenberg J.](#) Otogenic intracranial complications: a review of 28 cases. *Acta Otolaryngol.* 2005;125(8):819-22.
11. [Razzag AA, Jooma R, Ahmed S.](#) Trans-mastoid approach to otogenic brain abscess. *J Pak Med Assoc.* 2006; 56(3):132-5.
12. [Olatoke F, Ologe FE, Nwawolo CC, Saka MJ.](#) The prevalence of hearing loss among schoolchildren with chronic suppurative otitis media in Nigeria, and its effect on academic performance. *Ear Nose Throat J.* 2008 Dec;87(12):E19.
13. [Dubey SP, Larawin V, Molumi CP.](#) Intracranial spread of chronic middle ear suppuration. *Am J Otolaryngol.* 2010 Mar-Apr;31(2):73-7.
14. [Migirov L, Duvdevani S, Kronenberg J.](#) Otogenic intracranial complications: a review of 28 cases. *Acta Otolaryngol.* 2005; 125(8):819-22.
15. [Mostafa BE, El Fiky LM, El Sharnouby MM.](#) Complications of suppurative otitis media: still a problem in the 21st century. *ORL J OtorhinolaryngolRelat Spec.* 2009; 71(2):87-92.
16. [Dubey SP, Larawin V.](#) Complications of chronic suppurative otitis media and their management. *Laryngoscope.* 2007; 117(2):264-7.
17. [PenidoNde O, Borin A, Iha LC, Suguri VM, et al.](#) Intracranial complications of otitis media: 15 years of experience in 33 patients. *Otolaryngol Head Neck Surg.* 2005; 132(1):37-42.
18. [Zelikovich EI.](#) [Computed tomography (CT) of the temporal bone in diagnosis of acquired cholesteatoma of the middle ear]. *VestnOtorinolaringol.* 2004;(5):28-32.

