

Aural Polyps in Otolaryngology: Clinical Incidence and Therapeutic Outcome

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ABSTRACT:

Background: The Ear is an essential human organ that performs the unique sense of hearing and balance and communicates with the rest of the world. Any ear disease disrupts daily life. An aural polyp is a sequela of various chronic ear diseases. These diseases include chronic otitis media, which may be mucosal or squamous; long-term, unknown foreign-body impaction in children's ears; and neoplastic conditions, such as rhabdomyosarcoma in children and carcinoma in adults. The patient has been suffering for prolonged periods, and the parents of the children attend to the physician when there is discharge, earache, or hearing loss. In rural areas, the elderly and children are neglected due to a lack of knowledge of ear hygiene. **Method:** The study was conducted in the Otolaryngology Department of Comilla Medical College (<https://www.cumc.edu.bd>) and Comilla Medical Center (<https://www.comillamedicalcentre.com>), Bangladesh, from January 2018 to December 2022.

Result: Females (72%) and children (67.7%) are more sufferers. 71% live in rural areas, and 77.4% are poor; most patients, 41.9%, presented with ear discharge, blockage, and hearing loss, and 48.4% had a clinical diagnosis of mucosal otitis media with a polyp, 48.4% cases were treated with polypectomy and examination of the ear under magnification. The mean age was 20.5161 ± 20.5127 years; the mean follow-up in months was 29.00 ± 15.872 ; the GHQ mean was 22.6774 ± 2.5084 ; and the MAAS mean was 32.3236 ± 2.3293 . Univariate analysis of the GHQ total showed significant variables were sex*treatment, $P=.009$; age category, $P=.003$; age category*treatment, $P=.003$; and sex*diagnosis, $P=.009$. MAAS total

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revealed that sex*symptoms, $P=.040$, sex*diagnosis, $P=.005$, sex*treatment, $P=.005$, age category, $P=.010$, and treatment, $P=.036$. Follow-up showed that the follow-up category with sex, $P <.001$; age category with SES, $P=.050$; age category with symptoms, $P=.014$; age category with diagnosis, $P=.032$; and age category with treatment, $P=.032$.

Conclusion: Aural polyp is a term or misnomer for some disease conditions of the ear that must be evaluated after taking proper history, examinations, and investigations. An appropriate diagnosis confirms the disease pattern and helps the patients receive treatment.

Keywords: COM (Chronic otitis media), Foreign body, Cholesteatoma, Rhabdomyosarcoma.

Introduction:

Otitis media is common among rural people who love bathing in the ponds or rivers available to them. They cannot bother about ear hygiene. If they have a cold or an earache, they may be waiting to have their ear discharged. Sometime after the ear is discharged, the pain will spontaneously be relieved. Sometimes, after a cold attack, when they develop an ear blockage, they use cotton buds to clear the ear, which can injure the tympanic membrane and perforate the eardrum. Due to inadequate healthcare infrastructure, they are unwilling to receive proper treatment. They go to the drug shop, which is available in the village market, and the unqualified pharmacist sells some drugs for the treatment of the patient. Consequently, the patient develops chronic otitis media. Some ear cleaners in the village marketplace clean their ears without knowing anything about it. They also sometimes perforate the tympanic membrane. Acute otitis media is a temporary deformity that leads to chronic distortion of the tympanic membrane. It occurs in the pars tensa and sometimes in the flaccida. Chronic otitis media is a sequel of acute otitis media in which the discharge persists for three weeks to three months. The inflammatory process extends to the middle ear cleft, including the mastoid antrum, aditus ad antrum, middle ear cavity, and eustachian tube. It is characterized by ear discharge, hearing loss, and sometimes earache and tinnitus (World Health Organization, 2004) [1]. Chronic inflammation causes persistent infection and infiltration of mononuclear cells, including macrophages, lymphocytes, and plasma cells; tissue destruction induced by the persistent inflammatory

cells or the infecting agent; and attempts at healing by connective tissue replacement of damaged tissue, accomplished by the proliferation of small blood vessels. It is an ongoing process of healing and repairing. Here, varying degrees of middle ear mucosal edema increase chronic inflammatory cell activity and hyperplastic change (Tos et al., 1980) [2]. All these lead to the blushing vascular granulation tissue, which is clinically described as "Aural Polyp". So, the aural polyp results in prolonged or chronic inflammation, possibly due to an active squamous or mucosal variety. The annual incidence of cholesteatoma was approximately 3 per 100000 children and 9.2 per 100000 adults in northern Europe (Kemppainen et al., 1999; Tos et al., 1989) [3,4]. Children commonly present with foreign bodies in the ear, nose, or throat (Adam et al., 2018) [5]. An inanimate foreign body may be identified as an incidental feature in children that causes long-term irritation of the middle ear mucosa and aural polyp (Brown et al., 2004) [6]. The inert foreign body of the ear is asymptomatic in 47% of cases, and the children may present with aural polyps (Ansley et al., 1998) [7]. Rhabdomyosarcoma also presents as an aural polyp. Rhabdomyosarcoma accounts for up to 60% of all sarcomas in the pediatric population, and 40% occurs in the head and neck region (Fiona et al., 2018) [8]; half of these tumors occur within five years (Josephson et al., 1999) [9]. The prognosis of this tumor is terrible, and the induction of a multidisciplinary approach, in which surgery, chemotherapy, and targeted radiotherapy change the survival rate (McGill et al., 1989) [10]. Though rare, squamous cell carcinoma is a common malignant tumor. Primary external and

middle ear tumors in older patients in the sixth decade presented as bleeding polyps and serosanguinous discharge (Arriaga et al., 1990) [11].

The study aims to determine the distinct exceptional presenting features in children and adults and to make an appropriate diagnosis and treatment without delay.

Methods:

The research was a comprehensive study conducted at the Comilla Medical College Hospitals of Bangladesh in the ENT Department (<https://www.cumc.edu.bd>) and Cumilla Medical Center (<https://www.comillamedicalcentre.com>). The study period was from 1st January 2018 to 31st December 2022. The targeted patients were in the ENT outpatient and inpatient departments. One hundred thirty-nine thousand two hundred five (139205) patients consulted in the ENT outdoor. The patient with ear disease was operated on 5712 (4.103%), of which thirty-one (0.682%) were aural polyps. Definitive variables are sex, different age categories, residential status, socioeconomic status, clinical presentation, clinical diagnosis, treatment, and follow-up category. Uninterrupted variables are age in years, follow-up time in months, GHQ total, and MAAS total.

Statistical Methods:

The study was observational and analytical. All data were analyzed using SPSS version 31. The P value is significant <.05. Categorical and continuous variables are analyzed using appropriate statistical methods. After examining the study's standard,

some inferential tests were performed based on meaningful results, which may support the study's acceptability.

Result:

Figure 1 displays the endoscopic view of a mucosal aural polyp, figure 2 exhibits the endoscopic view of a granulation tissue polyp, figure 3 demonstrate right-sided aural polyp with facial palsy, figure 4 revealed a three-year-old child with an aural polyp is diagnosed with rhabdomyosarcoma and ptosis of the left eye, and figure 5 exhibit an older man was diagnosed with carcinoma of the right-sided middle ear with facial palsy. In the explanatory statistics, the independent variables were analyzed using frequencies and percentages (Table 1), and the dependent variable using the mean, error of mean, standard deviation, minimum, and maximum (Table 2). Inferential statistics included a univariate analysis of variance, with the dependent variables being follow-up time in months, GHQ total, and MAAS total. Univariate analysis of the GHQ total showed significant variables were sex*treatment, $P=.009$; age category, $P=.003$; age category*treatment, $P=.003$; and sex*diagnosis, $P=.009$ (Table 3). MAAS total revealed that sex*symptoms, $P=.040$, sex*diagnosis, $P=.005$, sex*treatment, $P=.005$, age category, $P=.010$, and treatment, $P=.036$ (Table 4). Follow-up showed that the follow-up category with sex, $P <.001$; age category with SES, $P=.050$; age category with symptoms, $P=.014$; age category with diagnosis, $P=.032$; and age category with treatment, $P=.032$ (Table 5).



Figure 1: Mucosal otitis media with aural polyp.



Figure 2: Squamous otitis media with aural polyp.



Figure 3: Right-sided aural polyp with facial palsy.



Figure 4: A three-year-old child with an aural polyp is diagnosed with rhabdomyosarcoma and ptosis of the left eye.



Figure 5: An older man was diagnosed with carcinoma of the right-sided middle ear with facial palsy.

Inclusion criteria:

The patients were clinically diagnosed with ear disease after a history, examination, and investigation. The patient with a discharging ear had ear fullness or hearing loss, with or without facial palsy, including the criteria of our research.

Exclusion criteria:

Some patients' parents and adult patients refused to include themselves in the research. Patients with chronic otitis media without polyps.

Table 1: The statistics of Categorical Variables.

Serial	Variables	Division	Frequency	Percentage
1	Sex	Female	22	71.0%
		Male	9	29%
		Total	31	100%
2	Different age categories between Children and adults	Children (00-17 years)	21	67.7%
		Adult (18 years and above)	10	32.3%
		Total	31	100%

3	The residential status of the participant	Rural	22	71.0%
		Suburban	6	19.4%
		Urban	3	9.7%
		Total	31	100%
4	Socioeconomic status of the participant	Poor	24	77.4%
		Lower middle	4	12.9%
		Upper middle	3	9.7%
		Total	31	100%
5	Clinical Presentations of the disease	Ear discharge, blockage, and itching.	10	32.3%
		Ear discharge, blockage, and hearing loss.	13	41.9%
		Ear discharge, hearing loss, and vertigo.	8	25.8%
		Total	31	100%
6	Clinical diagnosis of the disease	Mucosal otitis media with polyp	15	48.4%
		Foreign body with polyp	8	25.8%
		Squamosal otitis media with polyp	6	19.4%
		Malignancy	2	6.5%
		Total	31	100%
7	Treatment	Polypectomy and examination under magnification	15	48.4%
		Polypectomy and foreign body removal	8	25.8%
		Polypectomy and modified radical mastoidectomy	6	19.4%
		Punch biopsy	2	6.5%
		Total	31	100%
8	Follow-up category	One-time follow-up	8	25.8%
		More than one time follow-up	23	74.2%

Table 2: Mean, SD, Std error mean, Minimum, and Maximum of Continuous Variables.

Statistics					
		Age in years	Follow up time in months.	GHQ_total	MAAS_total
N	Valid	31	31	31	31
	Missing	0	0	0	0
Mean		20.5161	29.00	22.68	32.32
Std. Error of Mean		3.68421	2.851	.451	.418
Std. Deviation		20.51279	15.872	2.508	2.329
Minimum		3.00	3	18	27
Maximum		60.00	48	29	37

Table 3: Univariate Analysis of Variance; Dependent Variable: GHQ Total

Source	F	Significance
Sex*Treatment	4.920	.009
Age Category	11.246	.003
Age category*Treatment	6.189	.003
Sex*Diagnosis	4.920	.009

Table 4: Univariate Analysis of Variance; Dependent Variable: MAAS Total

Source	F	Significance
Sex*Symptoms	3.656	.040
Sex*Diagnosis	5.698	.005
Sex*Treatment	5.698	.005
Age Category	7.858	.010
Treatment	3.346	.036

Table 5: Univariate Analysis of Variance; Dependent Variable: Follow-up in months.

Source	F	Significance
Follow-up category with sex	22.985	<.001
Age-Category with SES	4.215	.050
Age-Category with Symptoms	6.966	.014
Age-Category with Diagnosis	5.158	.032
Age-Category with Treatment	5.158	.032

Discussion:

The ear is an organ of hearing and equilibrium. Unlike children, adult patients often notice symptoms such as hearing loss, ear discharge, ear blockage, itching, and vertigo. In developing countries, parents sometimes give their children only adequate attention, with a few exceptions. In rural areas, children of low socioeconomic status with ear problems are undiagnosed for prolonged periods. Aural polyps result from chronic ear diseases, such as COM (both active mucosal and squamous otitis media) and malignancy. A neglected foreign body is a rare condition that has not been widely recognized in the literature and by researchers.

In the present study, the prevalence of aural polyps is 5.42%, whereas Silva et al. (2021) [12] reported 3.3% and Sogebi et al. (2012) [13] reported 11.1%. So, prevalence varies across geographical regions.

In my paper, females (71.0%) predominated over males (29.0%), similar to Sogebi et al. (2012) [13], who reported females at 63.5% and males at 36.5%. Gabriel et al. (2019) [14] reported 73.2% males, with a male-to-female ratio of 2.7:1, which differs from my data. Vijoy Kumar Karla (Karla et al., 2018) [15] also reported a higher proportion of males (52%) than females (46%).

Regarding age, there were 67.7% children and 33.3 adults, with a mean age of 20.5161 years, SD=20.5127, and an age range from 3-60 years in my work, which is opposite to Sogebi's research (Sogebi et al., 2012) [13], which showed 34.6% were children, 65.4% adults, and a mean age of 27.1 years. Silva (Silva et al., 2021) described the mean age as 31 years, SD=18.6, with an age range from 1-73 years; unlike my work, Suraneni et al. (Suraneni et al., 2020) [16] most cases (27 out of 50) age were 21-40 years followed by 41-60 years whereas in my paper children were 21 (00-17 years) followed by adults 10 (18 years and above) out of total 31, Vijoy Kumar Karla (Karla et al., 2018) [15] expressed mean age=26.88 years, age range from 7-53 years was near to my reports.

Regarding residential and socioeconomic status, which is a part of the epidemiological and environmental factors in my work, rural accounted

for 22 (71%), suburban for 06 (19.4%), and urban for 03 (9.7%). Poor: 24 (77.4%), lower middle: 04 (12.9%), and upper middle: 03 (9.7%). Uhari et al. (1996) [17] concluded in their paper that COM is a sequela of acute otitis media (AOM) and recurrent AOM. Poor socioeconomic conditions and overcrowding are associated with increased risk of recurrent AOM and persistence of COM. Bangladesh is a country of rivers, ponds, and tanks, which are invariably present in rural areas. The maximum number of patients living in rural areas bathe and clean themselves in ponds and tanks. Their habit did not change after a single AOM attack. Due to a lack of ear hygiene knowledge, they develop COM and aural polyps.

Evaluating the clinical presentation, ear discharge, blockage sensation, and hearing loss was 41.9%, ear discharge, blockage, and itching 32%, and ear discharge, hearing loss, and vertigo was 25.8%, Sogebi (Sogebi et al., 2012) [13] reported earache 84.6%, ear discharge 82.7%, and fullness of ear 65.4% near to my data, Silva (Silva et al., 2021) [12] reported ear discharge 76%, ear bleeding 32% reflecting my work dissimilar with Gabriel (Gabriel et al., 2019) [14] paper, showed otalgia was 73.2%, ear blockage 53.7%, tinnitus 41.5%, and otorrhea 24.4%.

Observing the diagnosis, mucoid otitis media with polyp was 48.4%, foreign body with polyp was 19.4%, usually occurring in children, squamous otitis media with polyp 19.4% related with cholesteatoma, and malignancy 6.5%, one children with embryonal rhabdomyosarcoma and one adult with squamous cell carcinoma near to my report of Gliklich (Gliklich et al., 1993) [18] declared COM was 43%, cholesteatoma 29%, and retained tympanostomy tube 23% like foreign body, Suraneni (Suraneni et al., 2020) [16] found inflammatory polyp was 50%, cholesteatoma 30%, chronic nonspecific polyp 10%, polyp with abscess 6%, and the rest 4% two cases, one was squamous cell carcinoma, and another glomus tympanicum supported my work. Twab (Twab et al., 2015) [19] strongly supported my work by reporting that a polypoidal mass in the ear did not regress on medication, which was presumed to be a COM or a foreign body. Silva LA (33) [12] diagnosed COM

with cholesteatoma at 58%, COM without cholesteatoma at 28.3%, squamous cell carcinoma at 3.7%, tympanic paraganglioma at 2.4%, facial schwannoma at 2.4%, and others at 4.8%, reflecting my research. Sogebi (Sogebi et al., 2012) [13] exhibited otitis externa at 21.2%, otitis media at 69.2%, unknown at 9.6%, recurrence at 17.3%, and histopathology revealed inflammation at 69.4%, cholesteatoma at 26.5%, granulation tissue 4.1%, and not available 5.8% in, which supported my work. Gabriel (Gabriel et al., 2019) [14] revealed that simple aural polyp was 41.5%, keratinous cyst 19.5%, dermoid cyst 12.2%, capillary hemangioma 7.3%, squamous cell carcinoma 7.3%, epidermal cyst 4.9%, mixed hemangioma 2.4% and Vijoy Kumar Kerla (Kerla et al., 2018) [15] showed squamous COM 88%, meningioma 4%, neurilemmoma 4%, and capillary hemangioma 4% which is against my report.

Treatment and follow-up of the patient are running in the same way. After treatment, maintain a follow-up for further recurrence and treatment. Treatment consists of 48.4% polypectomy and examination of the ear under magnification, 25.8% was polypectomy and following examination to find out foreign body, and removal of it, 19.4%, polypectomy and following examination found cholesteatoma, and modified radical mastoidectomy (MRM) performed, and 6.5% punch biopsy for suspected cases of malignancy. The mucosal otitis media was planned for tympanoplasty in the second setting. The malignant cases were referred to an oncologist. All cases are treated with systemic antibiotics, antihistamines, and steroid ear drops for 2 weeks before surgery. Suraneni (Suraneni et al., 2020) [16] supported our treatment procedure except for aural polyps with cholesteatoma; they planned the modified radical mastoidectomy after confirmation of the histopathology report of the patient. High-resolution computed tomography (HRCT) of the temporal bone and histopathology sometimes avoid the surgical intervention and complications reported by Johnson (Johnson et al., 2013) [20], who faced profuse bleeding during the operation of a pseudoaneurysm of the internal carotid artery presenting as an aural polyp. Gabriel (Gabriel et al., 2019) also supported my treatment

procedures. However, William et al. (1989) [21] emphasized histopathological findings of squamosal otitis media with polyps and the use of a modified radical mastoidectomy in the second setting of the operation. Cheng et al. (2005) [22] concluded that HRCT imaging showed 98.6% accuracy in detecting temporal bone destruction due to cholesteatoma, and the decision to perform MRM in a specific polypectomy setting supported my treatment plan. My embryonal rhabdomyosarcoma child, a three-year-old boy, presented to me with left ear discharge, aural polyp, and ptosis of the left eye, in which the tumor extends behind the eye, as reported in the study of Attakkil (Attakkil et al., 2015) [23], showing left lower motor neuron palsy and left abducent palsy. The boy died within three months of diagnosis. One older man, 55 years, showed squamous cell carcinoma with facial palsy, which is similar to Silva (Silva et al., 2021) and Xenellies (Xenellies et al., 2011) [24] studies. He was referred to an oncologist for further treatment.

Conclusion:

After taking a proper history, performing an examination, and conducting investigations, I must evaluate the appropriate cause of aural polyps. The pediatric population is more vulnerable due to their habit of introducing unidentified inanimate foreign bodies for a prolonged period. This habit causes chronic irritation of the skin and mucosa of the external and middle ear, developing granulation tissue and aural polyps. Nearly 90 percent of the patients were children and adults. Both age groups are poor, living in villages, and suffering from COM and carelessness about oral hygiene. Recurrent inflammation of the middle ear is also responsible for the growth of aural polyps. Carcinoma in the aural cavity is uncommon but not unpredictable, presenting as an aural polyp. So, management depends on the cause; sometimes, quick treatment is needed. Hurried attempts at operation sometimes happen in catastrophic situations. To avoid it, decide on the final operation after the histopathological reports are available, or proceed with a second setting. Sometimes a tumor board is needed to make better treatment decisions.

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