Original Research Article

Pattern of Hearing Impairment in a tertiary Institution in Ado Ekiti, Nigeria

Abstract

Background: Hearing impairment is a common sensory impairment affecting all age group worldwide. Aims: This study aimed at determining the prevalence, sociodemographic features, aetiology, audiometry findings, impact on quality of life and management of hearing impairment in a tertiary health institution in Ado-Ekiti, Nigeria

Materials and Methods: This is a prospective hospital-based study of patients with complaints of hearing impairment in the ear, nose and throat department of Ekiti state university teaching hospital, Ado Ekiti.

The study was carried out from May 2017 to April 2018. Verbal consent was obtained from the patients/parents/guardian.

Data were obtained by using pretested interviewers assisted questionnaire.

All the data obtained were collated, documented and analyzed by using SPSS version 18.

Results: Prevalence of hearing impairment was 21.2%. There were 36.5% males and 63.5% female with male to female ratio of 1:1.5. Bilateral hearing impairment was predominant and accounted for 51.9%

Common aetiologic factors of hearing impairment among the patients were; 20.2% earwax impaction, 13.5% ototoxicity, 12.5% otitis media, 11.5% presbyacusis, 11.1% otitis externa and 10.1% febrile illnesses.

Common clinical features were earwax, earache, hard of hearing/ear blockage, ear discharge and tinnitus in 49.5%, 45.2%, 40.4%, 36.5% and 29.8% respectively.

The most Common type of hearing impairment was sensorineural hearing loss in 46.2%. Type A tympanometry (normal) was the commonest findings in 47.1%. Pure tone audiometry revealed mild, moderate and moderate-severe hearing impairment to be 44.7%, 27.9% and 20.2% respectively.

Common effect on quality of life were embarrassment, aggressiveness, social dysfunction and poor academic performance in 13.9%, 11.5%, 10.1% and 6.7%.

Majority of the patients in 63.5% had prehospital treatment. Conservative treatment was done in 26.9%. The surgery/procedure were done in 47.6%. Amplification and speech therapy in 13.5% and 6.7% respectively.

Conclusion: Hearing impairment is a hidden and common otologic disease with significant associated negative effect on quality of life in Ado- Ekiti, Nigeria.

Keywords: Hearing impairment, pattern, aetiology, treatment

Introduction

Hearing is said to be impaired when there is reduction in hearing acuity. This can be picked during conversation or otorhinolaryngology hearing assessment. Ear is one of the five special senses with which a human is gifted, and it is the most affected and neglected sensory organ in our body [1-2]. Moreover, hearing impairment is more expensive to managed than sight [1-2].

World Health Organization (WHO) estimates that prevalence of hearing impairment is 4% worldwide [1]. However, the prevalence of hearing impairment varies from one place to another. A prevalence of 6.3% was reported in a study in India [2]. Shaheen MM et al observed a prevalence of 11.9% in Bangladesh [3]. Furthermore, 10.4% and 9.8% prevalence were documented in two separate study in Turkey [4-5] and prevalence of 14.3% was observed in Iran [6]. All this high prevalence of hearing impairment was due to ear diseases, an ever-aging society and the growing use of personal listening devices such as mobile phone and transistor [7].

There are several aetiologic factors of hearing impairment and this includes congenital or genetic predisposition such as maternal rubella, birth asphyxia and ototoxicity. Acquired disorders such as ageing, infection like meningitis, chronic ear infections, use of ototoxic drugs, and exposure to excessive noise [8]. The epidemiologic factors in developing hearing impairment is augmented by male sex, less education status, occupational hazard like noise from transportation, industrial or military service [9-10].

Hearing impairment is usually secondary to some chronic disorders. The manifestation has negative consequence on quality of life. Hearing loss may limit meaningful communication, interaction and social connectivity and further leading to a lower health-related quality of life [11]. It may decrease physical and cognitive function of the sufferers [12]. Affected quality of life in hearing impaired individual that are mostly implicated includes depression, isolation and dementia [13-15].

Despite this level of prevalence of hearing impairment worldwide there is paucity of documents on this subject in developing country, Nigeria inclusive [16-17].

This study aimed at determining the prevalence, sociodemographic features, aetiology, audiometry findings, impact on quality of life and management of hearing impairment at the ear, nose and throat (ENT) department of Ekiti state university teaching hospital, Ado Ekiti, Nigeria.

Materials and Methods

This was a prospective hospital-based study of patients with complaints of hearing impairment at the ENT department of Ekiti state university teaching hospital, Ado Ekiti.

The study was carried out over a period of one year, from May 2017 to April 2018. Verbal consent was obtained from the patients/parents/guardian.

Data were obtained by using pretested interviewers assisted questionnaire. The information obtained include their biodata such as age, sex, occupation, religion, marital status. Detailed history on hearing impairment on duration, onset, nature, aggravating factors, relieving factors, associated symptoms were obtained and documented. other otorhinolaryngological, head and neck history on various diseases were obtained. Past medical, drug and surgical history were obtained and documented. Their occupation, family and social history of alcohol consumption and smoking were obtained. Detailed clinical otorhinolaryngological, head and neck examination were done with emphasis on otological/otoscopy. Anterior with or without posterior rhinoscopy and oropharyngeal examination were also carried out.

Inclusion criteria were patients with hearing impairment in the study center. While, exclusion criteria were patients without hearing impairment and those that decline.

Participants had audiometric investigations done to arrive at diagnosis. Minor ear procedures were given where indicated.

All the otorhinolaryngological, head and neck data obtained were collated, documented and analyzed. This analysis was done by using SPSS version 18. The obtained information were processed by descriptive method and illustrated by using percentage, frequency tables, bar chart and pie charts.

Ethical clearance was sought and obtained for this study from the ethical committee of the institution.

Results

The total number of patients seen in the ENT department during the study period were 983. Of this 208 patients had complaints of hearing impairment were enrolled in this study. The prevalence of hearing impairment was 21.2%. All the age group were involved with bimodal peak age value of 46 (22.1%) patients and 47 (22.6%) patients at age group (1-10) and >60 years respectively. Table 1 demonstrated age group distribution of the studied patients.

Sociodemographic characteristics

There were 76 (36.5%) males and 132 (63.5%) females. Male to female ratio was 1:1.5. Majority of the studied patients were Christians which accounted for 191 (91.8%) patients, while minority were 17 (8.2%) Muslim. The patients' residents comprised 122 (58.7%) urban and 86 (41.3%) rural. Patients educational level were nil formal and primary education in 71 (34.1%) and 53 (25.5%) respectively. Others were 48 (23.1%) post-secondary education and 36 (17.3%) secondary school certificate holders. Based on patients' occupation status majority 53 (25.5%) were artisan followed by 49 (23.6%) civil servant, 42 (20.2%) petty

business and 33 (15.9%) subsistence farming. The sociodemographic features of patients were illustrated in table 2.

Aetiologic factors of the hearing impairment.

The most common aetiologic factor of hearing impairment among the patients in this study was ear wax impaction in 42 (20.2%) patients, followed by 28 (13.5%) patients with ototoxicity, 26 (12.5%) otitis media, 24 (11.5%) presbyacusis, 23 (11.1%) otitis externa and 21 (10.1%) febrile illnesses. Others were 13 (6.3%) noise exposure, 9 (4.3%) ear trauma and 4 (1.9%) neonatal jaundice. Table 3 demonstrated aetiology of hearing impairment among pupils.

Lateralization of the hearing impairment.

In this study, bilateral hearing impairment was observed in 108 (51.9%) patients, whereas unilateral hearing impairment occurred in 100 (48.1%) patients. In unilateral hearing impairment right hearing impairment accounted for 54 (26.0%) while left hearing impairment accounted for 46 (22.1%). This is illustrated in figure 1.

Clinical features in the patients with impaird hearing.

Common clinical features encountered during otorhinolaryngology examination of the patients were earwax, earache, hard of hearing/ear blockage, ear discharge and tinnitus in 103 (49.5%), 94 (45.2%), 84 (40.4%), 76 (36.5%) and 62 (29.8%) patients respectively. Additionally, tympanic membrane perforation in 19 (9.1%) patients, vertigo in 17 (8.2%) patient and retracted tympanic membrane in 16 (7.7%) patients. Table 4 revealed clinical features among the patients.

Types of the hearing impairment.

In this study, the most common type of hearing impairment was sensorineural hearing loss which constituted 96 (46.2%) patients. conductive and mixed hearing loss were 78 (37.5%) and 34 (16.3%) patients respectively. Types of hearing impairment among patients is demonstrated in figure 2.

Audiometric and tympanometric findings among the patients.

In this study, type A tympanometry (normal) was the commonest findings in 98 (47.1%) patients, followed by type B tympanometry in 26 (12.5%) patients and type C tympanometry in 4 (1.9%) patients. Subjective test of pure tone audiometry revealed mild, moderate and moderate-severe hearing impairment to be 93 (44.7%) patients, 58 (27.9%) patients and 42 (20.2%) patients respectively. Severe hearing impairment was found in 9 (4.3%) patients and profound hearing impairment in 6 (2.9%) patients. Table 5 showed audiometric findings among the patients.

Quality of life among the patients with hearing impairment.

In this study, common effect of hearing impairment on quality of life were embarrassment, aggressiveness, social dysfunction and poor academic performance in 29 (13.9%) patients, 24 (11.5%) patients, 21 (10.1%) patients and 14 (6.7%) patients. Others were isolation in 12 (5.8%) patients and depression in 6 (2.9%) patients. Table 6 illustrated quality of life among the patients.

Treatment received by the patients.

One hundred and thirty-two patients (63.5%) had prehospital treatment (over the counter medication, local herbs, sacrifices and prayers) prior to hospital presentation. Conservative treatment of causes of conductive hearing loss such as ear wax impaction, otitis media and externa were done in 56 (26.9%). Surgery/procedure such as ear syringing, aural toileting/dressing and surgical treatment of conditions like, earwax impaction, foreign body impaction, suppuration, adenoid and tonsillar disorders were done in 99 (47.6%). Based on audiometric findings, recommendations were hearing aids for amplification and speech therapy in 28 (13.5%) and 14 (6.7%) respectively. Cochlear implant was required in 11 (5.3%) patients and these were referred to health institutions with facilities for cochlear implantation. Management of hearing impairment among patients is demonstrated in table 7.

Discussion

The prevalence of hearing impairment in this study was 21.2%. This prevalence is high and may be due to the cut-off level used for measuring hearing impairment in this prospective study. Common cut-offs used for hearing impairment ranges between 15 dB HL and 40 dB HL. Cut-off 25dB was used in this study. High prevalence was reported among lower primary school children in other study [18]. Contrastingly, lower prevalence was reported among children with middle ear diseases in some studies [3,19-22].

Females had a significantly higher sex prevalence of hearing impairment than males in this study. High personal ear hygiene and parental over protection of female child delicate nature may be responsible. Contrarily, most studies reported hearing impairment occurs more commonly in male due to their overactivity [23-24]. Females have a shorter stiffer cochlear which provides a more sensitive frequency response and the hair cells are stiffer and therefore more sensitive. This significantly increase noise induced hearing loss among female as also noticed in this study.

In this study, hearing impairment was significantly high among low education cadre, artisans and civil servants. Similarly, previous report revealed that hearing loss is more common in less educated patients [25]. This may probably be due to their lower socio-economic status, poorer access to good health, poorer standard of living and increased risk of recurrent ear infections [26].

Common aetiologic factors of hearing impairment in this study were ear wax impaction, ototoxicity, otitis media, presbyacusis, otitis externa and febrile illnesses. Earwax impaction usually due to self-ear cleaning as reported in a study from Nigeria [27]. Chronic outer and middle ear infections were reported common cause of hearing loss among Nigerians [28-29].

In this study, hearing impairment was mainly bilateral. Similar finding was reported in children with hearing impairment in a profile study [30]. Contrary finding was reported in other study [31]. Further analysis revealed right hearing impairment was commoner than left hearing impairment. This may be due to the fact that most patients in this study were right handed. Making right hand more easier and more commonly used in ear cleaning as reported in a study [32].

Common clinical findings in this study were earwax, earache, hard of hearing/ear blockage, ear discharge and tinnitus. This results from effect of the otologic pathology leading to hearing impairment. The clinical findings in this study was similar to reports from other studies [33-34].

Sensorineural Hearing Loss was the most common type of hearing impairment seen among the patients. This is followed by conductive hearing impairment. This is contrary to the findings reported by study done in another center [35-38]. The Sensorineural hearing loss might likely be the result of an irreversible neutral damage from infection, ototoxicity or trauma. Conductive hearing impairment was due to pathology such as cerumen impaction in the external auditory canal, fluid in the middle ear and CSOM. These disorders are common in individual with low immune status.

In this study, based on degree of hearing impairment the most prevalent was mild hearing impairment while the least common were profound hearing impairment. Presumably, severe and profound hearing impairment were either on street begging for Alms or could not afford hospital bill. Additionally, this finding is in agreement with studies on hearing impairment in children [37-38]. Main middle ear pathology from tympanometry findings was type B followed by type C. This was similar to reported findings in other study [21].

In this study, common effect of hearing impairment on quality of life were embarrassment, aggressiveness, social dysfunction and poor academic performance. This is similar to reported findings in a hearing profile study [39].

Management of patients with hearing impairment depends on the cause, associated complications, degree, type of loss and effect on quality of life. In this study, the group that had conservative treatment were those that had earwax impaction removal by using Jobson Hornes' prop or ear syringing after softening with cerumen disolvent agent. Chronic suppurative otitis media and otitis externa were managed by administration of broad spectrum antibiotics and topical aural dressing. The surgery/procedure such as mastoidectomy, middle ear surgery and adenoid and tonsillar surgeries based on our findings to eliminate potential source of middle ear infection and tympanoplasty were done to restore hearing apparatus. Assistive hearing devices and amplification are not readily available and affordable, and they are difficult to maintain by majority of our patients. This has limited few of the patients to acquire the recommended hearing aids. Treatment for severe and profound hearing impairment often require cochlear implant [40-41]. None of the patients referred for cochlear implant in this study accept it because they could not afford this treatment due to high cost and availability in lower income countries including Nigeria. commonly, most patients that required cochlear implant either go to special schools for the hearing impaired or end up on the street begging for alms.

Conclusion

Hearing impairment is a hidden and common otologic symptoms with associated effect on quality of life. Common causes are preventable and treatable conditions with irreversible sensorineural hearing in this study. Hearing screening and regular ear check are essential in developing countries. Facilities for cochlear implant should be available, accessible and affordable in developing country.

Limitation of this study

It is a hospital based-study; therefore, it may not reflect the true picture of hearing impairment in the community. A community-based study is required to show the true burden of this disease in our community.

References

1. World Health Organization. Fact sheet. Deafness and hearing impairment. Available at http://www.who.int/mediacentre/ fact-sheets/fs300/en/index.html.

2. National Programme for Prevention and Control of Deafness, Ministry of Health and Family Welfare, Government of India. Available from: moh.nic.in/nppcd.htm.

3. Shaheen MM, Raquib A, Ahmad SM, "Chronic suppurative otitis media and its association with socio-econonic factors among rural primary school children of Bangladesh," Indian Journal of Otolaryngology and Head and Neck Surgery. 2012; 64(1):36–41.

4. Erdivanli OC, Coskun ZO, Kazikdas KC, Demirci M. Prevalence of Otitis Media with Effusion among Primary School Children in Eastern Black Sea, in Turkey and the Effect of Smoking in the Development of Otitis Media with Effusion. Indian Journal of Otolaryngology and Head and Neck Surgery. 2012; 64(1):17–21.

5. Islam MA, Islam MS, Sattar MA, Ali MI. "Prevalence and pattern of hearing loss," Medicine Today. 2012; 23(1):18–21.

6. Mousavi A, Sedaie M. "Hearing screening of school age children (aged between 7–12 years old)," Audiology. 1996; 4(1-2):5–9 (Persian).

7. Agrawal Y, Platz EA, Niparko JK. Prevalence of hearing loss and differences by demographic characteristics among US adults: data from the National Health and Nutrition Examination Survey, 1999-2004. Arch Intern Med. 2008; 168:1522–1530.

8. Yueh B, Shapiro N, MacLean CH, et al. Screening and management of adult hearing loss in primary care: scientific review. JAMA. 2003; 289:1976–1985.

9. Cruickshanks KJ, Tweed TS, Wiley TL, et al. The 5-year incidence and progression of hearing loss: the epidemiology of hearing loss study. Arch Otolaryngol Head Neck Surg. 2003; 129:1041–1046.

10. Muhr P, Mansson B, Hellstrom PA. A study of hearing changes among military conscripts in the Swedish Army. Int J Audiol. 2006; 45:247–251.

11. Mick P, Kawachi I, Lin FR. The association between hearing loss and social isolation in older adults. Otolaryngol Head Neck Surg. 2014; 150:378–384.

12. Dalton DS, Cruickshanks KJ, Klein BE, et al. The impact of hearing loss on quality of life in older adults. Gerontologist. 2003; 43:661–668.

13. Lin FR, Metter EJ, O'Brien RJ, et al. Hearing loss and incident dementia. Arch Neurol. 2011; 68:214–220.

14. Horikawa C, Kodama S, Tanaka S, et al. Diabetes and risk of hearing impairment in adults: a meta-analysis. J Clin Endocrinol Metab. 2013; 98:51–58.

15. Li C, Zhang X, Hoffman HJ, et al. Hearing impairment associated with depression in US adults, National Health and Nutrition Examination Survey 2005-2010. JAMA Otolaryngol Head Neck Surg 2014; 140:293–302.

16. Agrawal Y, Platz EA, Niparko JK. Risk factors for hearing loss in US adults: data from the National Health and Nutrition Examination Survey, 1999 to 2002. Otol Neurotol. 2009; 30:139–145.

17. Bainbridge KE, Hoffman HJ, Cowie C. Diabetes and hearing impairment in the United States: audiometric evidence from the National Health and Nutrition Examination Survey, 1999 to 2004. Ann Intern Med. 2008; 149:1–10.

18. Onotai LO, Odeh JE, Anochie I. Risk Factors of Hearing Impairment among Lower Primary School Children in Port Harcourt, Nigeria. Glob J Oto 2017; 6(5):555675.

19. Sekhar DL, Zalewski TR, Paul IM. "Variability of state school-based hearing screening protocols in the United States," Journal of Community Health. 2013; 38(3):569–574.

20. Erdivanli OC, Coskun ZO, Kazikdas KC, and Demirci M. "Prevalence of Otitis Media with Effusion among Primary School Children in Eastern Black Sea, in Turkey and the Effect of Smoking in the Development of Otitis Media with Effusion," Indian Journal of Otolaryngology and Head and Neck Surgery. 2012; 64(1):17–21.

21. Absalan A, Pirasteh I, Khavidaki GAD, Asemi rad A, Esfahani AAN, Nilforoush MH. A Prevalence Study of Hearing Loss among Primary School Children in the South East of Iran. International Journal of Otolaryngology. 2013; 138935:1-4.

22. Kırıs M, Muderris T, Kara T, Bercin S, Cankaya H, Sevil E. "Prevalence and risk factors of otitis media with effusion in school children in Eastern Anatolia," International Journal of Pediatric Otorhinolaryngology. 2012; 76(7):1030–5.

23. Phillips M, Lurito J. Temporal lobe activation demonstrates sex-based differences during passive listening. Radiology. 2001; 220:202-207.

24. Cassidy J, Dity K. Gender differences among newborns on a transient otoacoustic emissions test for hearing. J Musical Therapy. 2001; 37:28-35.

25. Wikepedia, the free encyclopedia. Hearing impairment. Available:http://en.wikepedia.org/wiki/hearing-impairment.

26. Taha AA, Pratt RS, Farahat TM, Abdel-Rasoul GM, Albtanony MA, ELrashiedy AE, et al. Prevalence and risk factors of hearing impairment among primary school children in Shebin El-kom district, Egypt. Am J Audiol. 2010; 19:46-60.

27. Adegbiji WA, Alabi BS, Olajuyin OA, Nwawolo CC. Earwax impaction: Symptoms, predisposing factors and perception among Nigerians. J Fam Med Primary Care 2014; 3:379-82.

28. Adegbiji WA, Aremu SK, Olatoke F, Olajuyin AO, Ogundipe KO. Epidemiology of otitis Externa In Developing Country. Int J Recent Sci Res. 2017; 8(6):18023-7.

29. Adegbiji WA, Alabi BS, Omokanye HK, Fadeyi A, Nwawolo CC, Akande HJ. Clinico-mycological profile of otomycosis in two tertiary health institutions in Nigeria – a prospective study. Port Harcourt Medical Journal. 2012; 6:258-63.

30. Olusanya BO, Okolo AA, Ijaduola GTA. The Hearing profile of Nigerian school children. Intl J Paediatr Otorhinolaryngol 2000; 55(3):173-9.

31. Daud MK, Noor RM, Rahman NA, Sidek DS, Mohamad A. The Effect of mild hearing loss on academic performance in primary school children. Intl J Paediatr Otorhinolaryngol 2010; 74(1):67-70.

32. Adegbiji WA, Olajide GT. Pattern of Otalgia in Ekiti, Nigeria. American Journal of Medical Sciences and Medicine. 2017; 5(3):56-61.

33. Renjit RE, Manonmony S, Philip JT, Jose DJ. Spectrum of ENT diseases among urban school children in South Kerala, India. International Journal of Biomedical Research. 2014; 5(5):355-8.

34. Sapra G, Srivastava SP, Modwal A, Saboo R, Saxena G, Gyanu J. Hearing Assessment of School Going Children of Various Schools in Jaipur, Rajasthan. Sch. J. App Med Sci. 2015; 3(2B):638-45.

35. Yamamah G, Mabrouk A, Ghorab E, Abdulsalam H. Middle ear and hearing disorders of school children aged 7-10 years in South Sinai, Egypt. East Mediterr Health J. 2012; 18(3):255-60.

36. Nogueira JC, Mendonca MD. Assessment of hearing in a Muncipal public school student population. Braz J otorhinolaryngol. 2011; 77(6):716-20.

37. Hussain T, Abdullah A, Alghasham, Raza M. Prevalence of hearing impairment in school children. Int J Health Sci. (Qassim), 2011; 5(2 Suppl 1):46–8.

38. Chishty SL, Hamid S, Lateef E, Chisti ML, Wani A, Nazeeb Q. A prospective study of hearing impairment in school going children of Ghaziabad City attending a tertiary care hospital. Int J Res Med Sci., 2014; 2(3):1127-33.

39. Patel HC, Moitra M, Modi A, Contractor J, Kantharia SL. Impact of Hearing Loss on Daily Life Style and Schooling among Children between 5 and 15 Years Age-Group, Natl J Community Med 2014; 5(1):73-6.

40. Lasak JM, Allen P, McVay T, Lewis D. Hearing loss: Diagnosis and management. Prim Care. 2014; 41(1):19–31.

41. Goldenberg D, Goldstein BJ, editors. Handbook of otolaryngology: Head and neck surgery. New York: Thieme Medical Publishers, 2011.

Table 1: Distribution of the patients by age group.

Age group (years)	Number	Percentage (%)
1-10	46	22.1
11-20	23	11.1
21-30	16	7.7
31-40	22	10.6
41-50	24	11.5

51-60	30	14.4
>60	47	22.6
Total	208	100

Table 2: Sociodemographic features of the patients

Sociodemographic features	Number	Percentage (%)
Sex		
Male	76	36.5
Female	132	63.5
Religion		
Christian	191	91.8
Muslim	17	8.2
Residential		
Urban	122	58.7
Rural	86	41.3
Education level		
Nil	71	34.1
Primary	53	25.5
Secondary	36	17.3
Post-secondary	48	23.1
Occupation status		
Students/apprentices	31	14.9
Business	42	20.2
Artisan	53	25.5
Civil servant	49	23.6
Farming	33	15.9

328 Table 3: Aetiology of hearing impairment among patients

Aetiology	Number	Percentage (%)
Febrile illnesses	21	10.1
Birth asphyxia	3	1.4
Neonatal jaundice	4	1.9
Otitis media	26	12.5
Otitis externa	23	11.1
Ototoxicity	28	13.5
Earwax impaction	42	20.2
Congenital anomalies		
Ear trauma	3	1.4
Noise exposure	9	4.3
Presbyacusis	13	6.3
Others	24	11.5
	12	5.8

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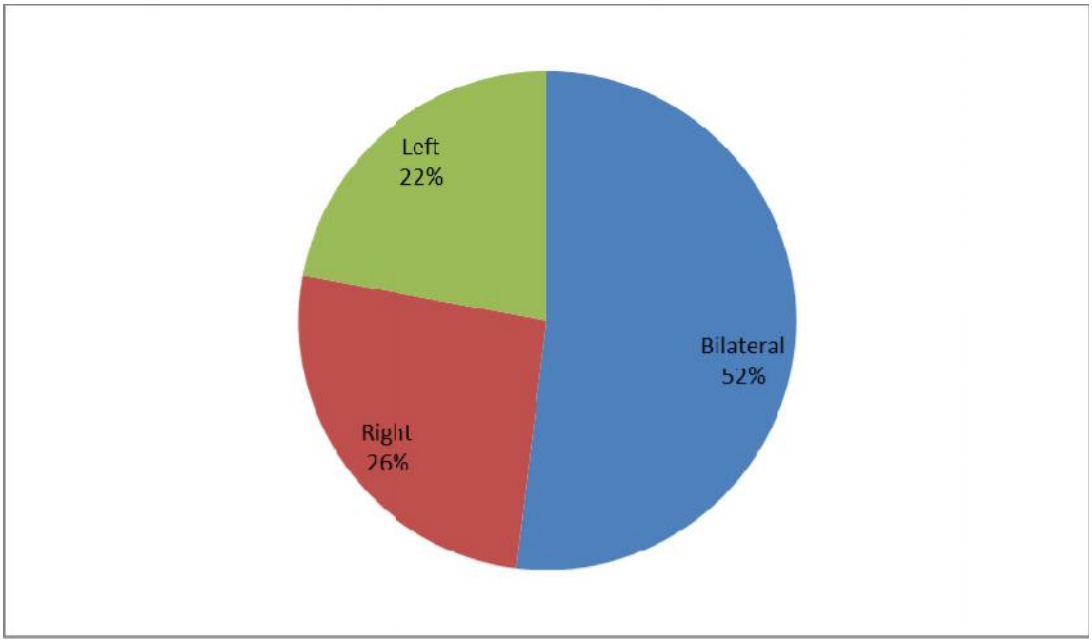

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334 Figure 1: Lateralization of hearing impairment.

335 Table 4: Clinical features of hearing impairment among the patients

Clinical features	Number	Percentage (%)
Ear discharge	76	36.5
Vertigo	17	8.2
Tinnitus	62	29.8
Earwax	103	49.5
Earache	94	45.2
Hard of hearing/ear blockage	84	40.4
Rhinorrhea	36	17.3
Fungal debris	22	10.6
Hyperaemic tympanic membrane	9	4.3
Retracted tympanic membrane	16	7.7
Perforated tympanic membrane	19	9.1
Adenotonsillar hypertrophy	8	3.8

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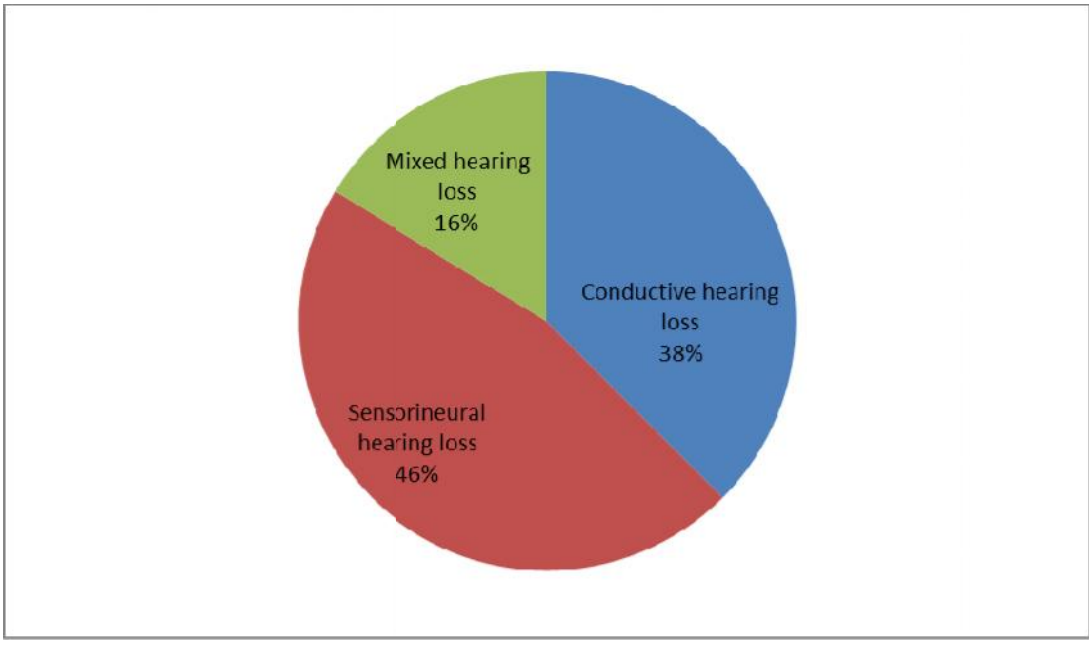

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339 Figure 2: Types of hearing impairment among the patients.

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342 Table 5: Audiometric and tympanometric features among the patients

Audiometric and tympanometric findings	Number	Percentage (%)
Tympanometric findings		
Type A	98	47.1
Type B	26	12.5
Type C	4	1.9
Others (not done)	80	38.5
Audiometric findings		
Mild	93	44.7
Moderate	58	27.9
Moderate severe	42	20.2
Severe	9	4.3
Profound	6	2.9

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344 Table 6: Quality of life among the patients

Quality of life	Number	Percentage (%)
Poor academic performance	14	6.7
Isolation	12	5.8
Aggressiveness	24	11.5
Embarrassment	29	13.9
Social dysfunction	21	10.1
Depression	6	2.9
No effect	102	49.1
Total	208	100

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352 Table 7: Treatment received by the patients

Treatment	Number	Percentage (%)
Prehospital	132	63.5
Conservative	56	26.9
Surgery/procedure	99	47.6
Augmentation	28	13.5
Speech therapy	14	6.7
Referral	11	5.3

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