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Prevalence of hearing loss among patients attending the private otolaryngology clinic, Ramadi city, Anbar, Iraq

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Abstract

Background Hearing loss is a common problem worldwide with a global prevalence of 20%. There is no local relevant study from Iraq about the prevalence of hearing loss.

Objective To assess the prevalence of hearing loss among patients attending the otolaryngology clinic, Ramadi city, Iraq.

Method This retrospective study was conducted at the otolaryngology clinic, Ramadi city, Anbar government, Iraq. Patients with hearing loss were enrolled in the current study. Data were gathered from patients record regarding the age, sex, type, side, and severity of hearing loss. Additionally, the number of cases were registered for each month during the study period.

Results Out of 8497, there were 2165 (25.48%) patients with hearing loss. The highest number of cases was registered in April ($n = 246$, 11.4%). The highest age group affected was 18–60 years ($n = 1125$) with slight male predominance (51.64%). The main cause of hearing loss was secretory otitis media ($n = 762$, 35.19/5). The vast majority of cases were with conductive hearing impairment ($n = 2051$, 94.73%). Unilateral hearing loss (50.76%) was slightly more than bilateral one. Mild hearing loss has outnumbered ($n = 1905$, 88%) the other severities.

Conclusion The prevalence of hearing loss was 25.48%. Hearing loss could affect any age with slight male predominance. The majority of the cases were with conductive type and mild severity.

Keywords Hearing loss, Deafness, Conductive hearing loss, Sensorineural hearing loss

Background

Hearing is one of the five special senses of the human. It is crucial for language acquisition, cognition, learning, and social communication [1]. It is estimated that 95% of learning comes from hearing and sight [2]. Hearing

loss is considered the most common sensory deficit in human beings worldwide [3]. It is estimated that hearing loss occurs in 432,000,000 adults and 34,000,000 children in the world. By the year 2050, it is suspected that hearing loss affects more than 700,000,000 individuals with an approximate ratio of 1/10 (1 for each 10 individual) (<https://www.who.int/en/news-room/fact-sheets/detail/deafness-and-hearing-loss>).

Hearing loss is typically classified into conductive, sensorineural, and mixed types. It might be due to congenital or acquired causes. Congenital hearing loss could be syndromic or non-syndromic reasons, while acquired one is due to various causes such as infection,

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wax impaction, traumatic tympanic membrane perforation, noise-induced hearing loss, presbycusis, and ototoxicity [4–6].

Hearing loss occurs in any age from newborn to elderly and in both sexes. It varies in severity from mild to total loss. Besides, it could be unilateral or bilateral [7].

Usually, the treatment of hearing loss depends on the type. In most cases of conductive hearing loss, the treatment is useful. While in sensorineural cases, rehabilitation with hearing aids or cochlear implant is satisfactory. Anyhow, early diagnosis with prompt intervention is of utmost importance in the management of hearing loss [4]. However, if these measures are delayed or not taken, many cases end with disabilities that prevent the sufferer from participation in a community in a proper way. Therefore, hearing loss is one of public health problem.

In Iraq, there are several studies investigating the prevalence of certain causes of hearing loss and in certain population [8–11]. However, there is no local relevant comprehensive study about the causes of hearing loss in different age groups. Besides, understanding the causes of hearing loss and their frequencies is an essential issue for the decision-makers to occupy this public health problem properly. Hence, this study was conducted to evaluate the prevalence of hearing loss among patients attending the private otolaryngology clinic, Ramadi city, Anbar, Iraq.

Methods

This retrospective cross-sectional study was conducted at private otolaryngology clinic, Ramadi city, Anbar, Iraq. The study covered the 2019 year (the authors selected this year, just before the COVID-19 pandemic, to reach the accurate sample size). Ramadi city is the center of the Anbar Governorate, west of Iraq. Around 375,000 inhabitants live in this city. This investigation was approved by the Ethical Approval Committee of the University of Anbar (reference number 44, on 6/3/2024). Informed consent from participants was waived owing to the retrospective nature of the study.

The study included any patient with hearing loss from any age and of both genders. Patients with incomplete data were excluded from the current study.

Patients' information was collected from records of the otolaryngology clinic. These include demographic (age and gender) and clinical characteristics (cause, type, laterality, and severity). Besides, data regarding the audiological tests (pure-tone audiogram, tympanogram, and auditory brain response test) and radiological imaging in the form of computerized tomography scan and magnetic resonance imaging (for certain patients) were registered too.

The severity of hearing loss was divided into mild (26–40 dB), moderate (41–60 dB), severe (61–80 dB), and profound (81 dB and greater) [5].

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS IBM, USA) version 28. Continuous variables were presented as mean \pm SD, while the categorical variances were presented in figures or tables as frequencies and percentages. Chi-square test was used for the comparison between the categorical variables. A *P*-value of <0.05 is considered a statistically significant difference.

Results

Out of 8497, there were 2165 (25.48%) patients seen during the study period presented with hearing loss. The highest number of cases was seen during April ($n=246$, 11.4%) while the least in January ($n=113$, 5.2%) as shown in Table 1. There was a statistically significant difference among months regarding the frequency of cases with hearing loss (*P*-value=0.0001).

The age of the enrolled patients ranged from 1 to 96 years with a mean age of 27.38 ± 19.361 years, while the median and mode were 24 and 9 years, respectively. The highest age group affected was 18–60 years ($n=1125$). Males ($n=1118$, 51.64%) were slightly outnumber the females with a male-to-female ratio of 1.07/1. Males were mostly affected in the age group <18 years ($n=544$, 58.43%), while females were predominant in number than males in the age group 18–60 years ($n=603$, 54.6%) and >60 years ($n=57$, 52.3%) as indicated in Table 2. There was a statistically significant difference (*P*-value=0.0001) between gender and age group.

Table 1 The frequency of hearing loss according to the month of 2165 patients

Month	Frequency	Percent	Valid percent	Cumulative percent	<i>p</i> -value
January	113	5.2	5.2	5.2	0.0001
February	148	6.8	6.8	12.1	
March	231	10.7	10.7	22.7	
April	246	11.4	11.4	34.1	
May	159	7.3	7.3	41.4	
June	142	6.6	6.6	48.0	
July	183	8.5	8.5	56.4	
August	135	6.2	6.2	62.7	
September	203	9.4	9.4	72.1	
October	221	10.2	10.2	82.3	
November	181	8.4	8.4	90.6	
December	203	9.4	9.4	100.0	
Total	2165	100.0	100.0		

Chi-square test was used

Table 2 The distribution of the 2165 cases with hearing loss according to the age and sex. Chi-square test was used for the statistical analysis

Age group per year	Sex			p-value
	Males Number (%)	Females Number (%)	Total number (%)	
< 18	544 (58.43%)	387 (41.57%)	931 (100%)	0.0001
18–60	522 (46.4%)	603 (54.6%)	1125 (100%)	
> 60	52 (47.7%)	57 (52.3%)	109 (100%)	
Total	1118 (51.64%)	1047 (48.36%)	2165 (100%)	

The majority (2051, 94.73%) of the cases were of conductive hearing loss (Fig. 1). There was a statistically significant difference (P -value < 0.0001) among the types of hearing loss.

The most common cause of hearing loss was secretory otitis media ($n=762$, 35.19%) and the least osteoma of external auditory canal ($n=1$, 0.046%) as shown in Table 3. There was a statistically significant difference (P -value = 0.0001) among the causes of hearing loss.

About 50% of the cases were bilateral (Fig. 2).

The majority of the cases were with mild hearing loss ($n=1905$, 88%) while the least profound ($n=7$, 0.3%) as illustrated in Table 4. There was a statistically significant difference (P -value = 0.0001) among the severities of the hearing impairment.

Discussion

Hearing loss is one of the most common public health problems. Despite the great effort from all nations in declining the prevalence and disability of this disease, these problems still require a lot of time and work [12]. Hearing disability is considered the main cause of financial burden at the level of the person and population. There are various reasons which affects the prevalence of hearing loss among different previous investigations which include the following: definition of hearing loss, type of hearing loss, geographical variation, study design (population based or hospital based), and targeting population (neonates, children, adults, or elderly). The global prevalence of hearing loss (≥ 20 dB) is 19.3%, the highest in Western Pacific Region (21.5%) and the lowest (14.3%) in European region [13]. The all over prevalence of hearing loss in Mahabubnagar district, Telangana state, India

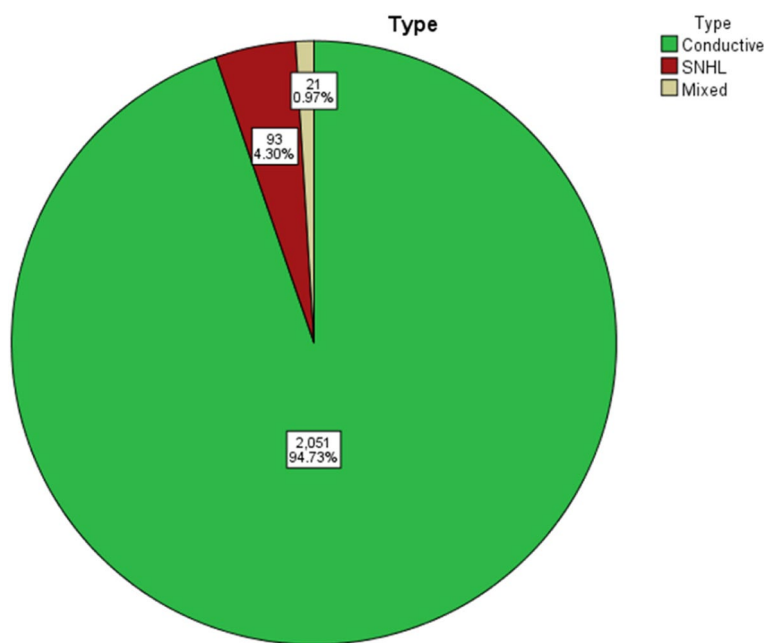


Fig. 1 The distribution of 2165 cases according to the hearing loss type. P -value = 0.0001. Chi-square test was used for the statistical analysis

Table 3 The distribution of the cases according to the causes of hearing loss. Chi-square test was used for the statistical analysis

Type of hearing loss	Cause of hearing loss	Frequency	Percent	p-value
Conductive	SOM	762	35.19	0.0001
	Wax	551	25.45	
	CSOM	327	15.10	
	ASOM	141	6.51	
	OE	117	5.40	
	Otomycosis	61	2.81	
	TTMP	35	1.61	
	Tympanosclerosis	21	0.96	
	FB	18	0.83	
	Bullous myringitis	8	0.37	
	Adhesive otitis media	5	0.23	
	Otosclerosis	4	0.18	
	Osteoma	1	0.046	
	SNHL	Idiopathic SNHL	35	
Presbycusis		29	1.33	
NISNHL		10	0.46	
SSNHL		9	0.42	
Congenital		7	0.32	
Meniere's disease		3	0.14	
Mixed	CSOM	17	0.79	
	Otosclerosis	4	0.18	

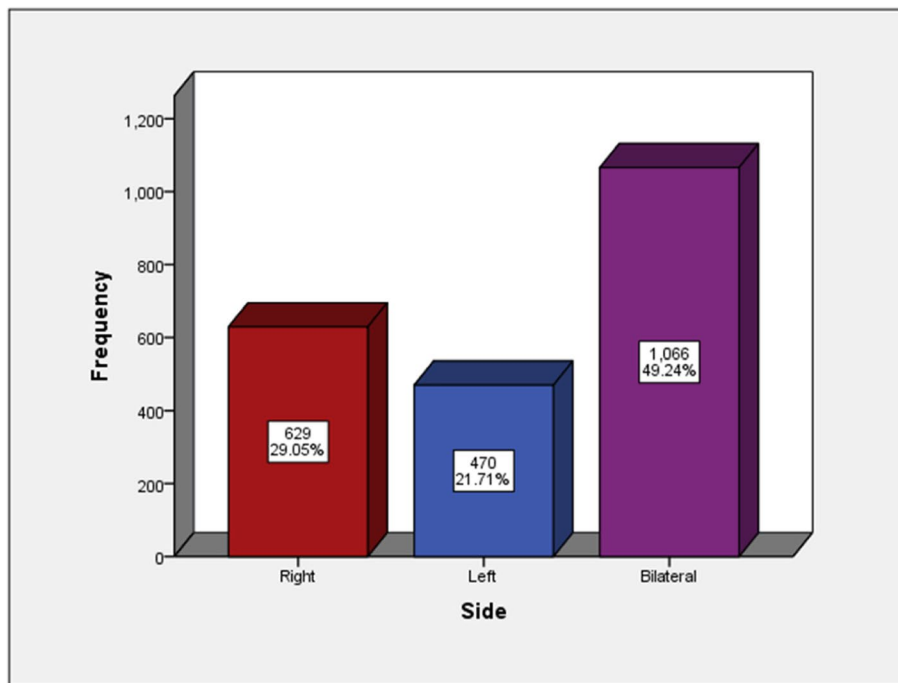


Fig. 2 The distribution of the 2165 cases according to side of hearing loss

Table 4 The severity of hearing loss in 2165 patients

Severity	Frequency	Percent	Valid percent	Cumulative percent	p-value
Mild	1905	88.0	88.0	88.0	0.0001
Moderate	207	9.6	9.6	97.6	
Severe	46	2.1	2.1	99.7	
Profound	7	0.3	0.3	100.0	
Total	2165	100.0	100.0		

Chi-square was used for the statistical analysis

is 8.9%, while disabling hearing loss (hearing loss in the better ear of ≥ 41 dB in adults and ≥ 31 -dB HL in children according to the World Health Organization 2012) is 4.5% [14]. In a recent population-based survey from Gao'an county, Jiangxi province, China reported a hearing loss (pure-tone average of 0.5, 1, 2, 4 kHz) prevalence of 53.2% [15]. An investigation from Egypt reported a prevalence of hearing loss of 9.2% among primary school children [16]. Many population-based investigations from Cameroon reported that the prevalence of hearing impairment ranges from 0.9 to 3.6% [17]. A large population study from Canada estimates the prevalence of hearing loss in children and adolescent (3–19 years old) of 7.7% [18]. Hearing loss affects 23% of population (≥ 12 years old) from the United States of America (USA) [19]. The present study reported a prevalence of hearing impairment of 25.48% which was higher than the previous study from Germany (found that 19% of patients visiting outpatient general practitioner clinic were with hearing impairment) [20]. The difference in the prevalence between the two studies might be related to enrollment of the patients (all cases with hearing loss in the current study vs. only patients with hearing impairment of ≥ 40 dB in W. Sohn and W. Jorgenshaus's study). A further investigation from Scotland reported 20% of the responders to the postal self-completed questionnaire about the ear, nose, and throat (ENT) symptoms had hearing impairment [21].

Seasonal variation is considered a risk factor of middle ear pathology as different types of otitis media occur in winter and spring seasons [22]. High prevalence of otitis media has been recognized in winter season because of high incidence of influenza, common cold, and other upper respiratory tract infections [11, 22], while high frequencies of otitis media and Eustachian tube dysfunction are seen in spring season because of the increment in the hay fever and pneumonia cases [22]. This study fails to show such seasonal variation. This might be attributed to two reasons: first, the current study has studied all cases of hearing loss. Second, the number of cases seen in the otolaryngology clinic is decreased by religious and national holidays or weather changes.

The current study reported a slight male predominance which is in alignment with a study from the USA [19]. However, it contradicts the study from India which reported 52% of the study population were females [14]. It can be concluded that hearing loss affects both sexes in nearly equal proportions.

The present investigation revealed that there was a high prevalence of hearing impairment in the first two age groups (<18 years and 18–60 years). This might be due to the possible causes such as the high prevalence of otitis media in children, type of occupation (those who work in factories with loud sound machines), outdoor activities which might result in traumatic condition of the ear, high prevalence of allergic rhinitis, and other possible causes which affect these age groups. However, this study revealed low prevalence of hearing loss in the age group >60 years. This might be due to that the age of 60 years is the retirement age in Iraq resulting in decreasing the outdoor activities, and many cases of sensorineural hearing loss are diagnosed and treated with hearing aids. This observation contradicts the previous population-based survey investigations which found that the prevalence of hearing loss increases with increasing age [13, 19, 23].

Hearing impairment could be unilateral or bilateral. Furthermore, many causes of hearing loss (like wax impaction, secretory otitis media, and congenital hearing loss) might affect one or both ears. Our study revealed that unilateral hearing loss was slightly more than bilateral one. This finding was consistent with other investigations [19]. This may be attributed to that the unilateral causes of hearing loss (for example, acute suppurative otitis media, otitis externa, trauma, and noise-induced sensorineural hearing loss) are slightly more prevalent than bilateral causes (such as secretory otitis media, ototoxicity). Moreover, the majority of the hearing loss causes (like otitis media with effusion or chronic suppurative otitis media) might be unilateral or bilateral.

The vast majority of the cases in our investigation were of conductive type and of mild severity. This finding was consistent with other studies [13, 24]. This observation indicates that most of the hearing loss cases are avoidable or treatable.

Hearing impairment has a great burden on any population which necessitates certain action like newborn hearing screening program, proper treatment of different types of otitis media and meningitis, and early rehabilitation with hearing aids or cochlear implants to reduce the effect of this burden [13]. Furthermore, population-based studies of hearing loss (based on Global Burden of Disease study) from all countries across the globe are highly recommended to evaluate the problem and inform global decision-makers to find a proper solution [25].

Owing to the inclusion of the hearing loss cases to only one private clinic in our city, the sample size was small.

This was a limitation to the current study. Therefore, the results of the present investigation cannot be generalized. In second limitation, certain information was missed like income level of the patient; therefore, the current study did not take these factors into consideration. In third limitation, the study did not compare the causes of hearing loss with the seasons of their occurrence (which of great importance) because it is out of the scope of the study. We recommend further studies to compare the causes of hearing loss and seasons.

Conclusion

Hearing loss was a common symptom seen in the general otolaryngology clinic. This problem affects both sexes and any age. The majority of cases were with conductive hearing loss and mild severity. Owing to the significance of hearing loss on the community as well as there is no population-based survey study in Iraq, such study at national level is highly recommended to inform the decision-makers taking appropriate solution to occupy this problem.

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None.

Authors' contributions

RMA designed the study and supervised the work. KKJ wrote the introduction section. NHM reviewed the literature regarding the references of hearing loss prevalence. OFA wrote the methodology section. RMA analyzed and interpreted the patients' data regarding the causes of hearing loss. FWF and SHM wrote the discussion section. The authors read and approved the final version of the manuscript.

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Availability of data and materials

Data are available upon reasonable request from the corresponding author.

Declarations

Ethics approval and consent to participate

This study was approved by the Ethical Committee of the University of Anbar. Owing to the retrospective nature of the study, informed consent was waived from the patients.

Consent for publication

No personal data were published. Therefore, this action is not required from the participants.

Competing interests

The authors declare that they have no competing interests.

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