Characteristics of hearing loss in Dar es Salaam, Tanzania

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ABSTRACT

Introduction: Hearing loss is a major public health problem in developed and developing countries. The objective of this study was to determine the causes and patterns of hearing loss at a private hospital that serves the largest number of patients with ear, nose and throat diseases in Tanzania's largest city.

Method: This was a hospital based descriptive cross-sectional study that was conducted at a private hospital in Dar es Salaam. Data were collected from January to June 2021 and analysed using Statistical Package for Social Sciences (SPSS) version 20. P-value<0.05 was considered to be statistically significant.

Results: Of the 250 patients recruited with hearing loss, there were 115 (46%) males and 135 (54%) females (F:M ratio of 1.2:1). The commonest cause of hearing loss was presbyacusis 132 (52.8%) followed by ototoxicity 26 (10.4%) and chronic suppurative otitis media 26(10.4%). Based on laterality, 73.2% of the patients had unilateral hearing loss whereas 26.8% had bilateral hearing loss. Regarding the type of hearing loss, 85.6% of the patients had sensorineural hearing loss followed by conductive type (13.2%) and mixed hearing loss (1.2%). Based on severity, 40.8% of the patients had moderate hearing loss followed by both moderately severe and severe hearing loss each accounting for 18% of cases.

Conclusion: Sensorineural hearing loss was the commonest type of hearing loss in this study. Both unilateral hearing loss according to laterality and moderate hearing loss upon classifying by severity predominated. Age-related hearing loss was the most common cause of hearing loss followed by ototoxicity and chronic suppurative otitis media.

Keywords: Hearing loss, causes, patterns, characteristics, Tanzania

INTRODUCTION

Hearing loss is a common disabling disorder affecting paediatric and adult populations.[1] Its prevalence appears to be comparable to that of chronic disorders such as diabetes mellitus, arthritis and hypertension.[2]

Developing countries contain the largest number of people with disabling hearing loss.[2] According to the World Health Organization (WHO), 360 million persons in the world have disabling hearing loss and 328 million of these are adults living mostly in developing countries.[2,3] This could be attributed to poor health-care systems and limited ear and hearing health-care physicians.[2]

Hearing loss may be associated with unpleasant consequences such as poor speech and language development during childhood and in adults it has negative social, emotional, and economic implications.[3,4]

The pattern of hearing loss can be sub-divided into conductive, sensorineural or mixed moieties. Conductive hearing loss occurs when there is a defect in the sound conducting mechanism of the ear and the pathology could be anywhere from external auditory canal to the footplate of the stapes. The conductive type is usually easily treatable.[5,6] Sensorineural hearing loss may be due to abnormality

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in the cochlear, auditory nerve, neural pathway or their connection with auditory cortex and may be associated with disabling consequences usually requiring rehabilitation. Mixed hearing loss is due to an abnormality causing both conductive and sensorineural hearing losses.[7]

Causes of hearing loss can be broadly grouped into congenital or acquired with acquired causes being more common in developing countries.[5] Congenital includes hereditary and non-hereditary genetic factors such as maternal rubella and syphilis, low birth weight, birth asphyxia, drugs such as aminoglycosides and cytotoxics as well as severe neonatal jaundice.[3,5] Acquired hearing loss can be due to infectious diseases such as meningitis, measles, and mumps. Other causes are chronic suppurative otitis media, ototoxicity, noise induced and ageing. [2] Audiometric testing plays a vital role in establishing the diagnosis of hearing loss in hearing acuity. Hearing function is measured in decibels and hearing loss is said to have occurred if the threshold of hearing is elevated above 25dB. Other tests are otoacoustic emissions (OAEs), auditory brainstem response measurements and tympanometry.[8] To date there are limited studies on hearing loss among private health facilities in Dar es Salaam despite the increased burden of hearing impairment. This study aimed to address this gap.

METHOD

Study design, settings and participants

This was a hospital based descriptive cross-sectional study among patients who attended Ekenywa Specialised Hospital for hearing loss assessment in Dar es Salaam, Tanzania from January to June 2021. Patients recruited were aged 1-90 years.

Data collection

Data were collected using structured questionnaires and only those who consented to participate were recruited while those who had hearing loss though being mentally unwell were excluded.

Pure tone audiometry (PTA) was performed by a clinical audiologist in a sound-proof room using an audiometer (Amplivox 270) after a history and physical examination. Bone and air conduction thresholds were tested at frequencies range from 250HZ to 8000HZ. Hearing was graded as per WHO grades of hearing impairment whereby 0-25 dB was regarded as normal hearing, 26-40dB mild hearing loss, 41-55dB moderate hearing loss, 56-70 dB moderately severe hearing loss, 71-90dB severe hearing loss and >90dB profound hearing loss.[9] The type and severity of hearing loss were assessed in each ear as stipulated on the audiogram charts. Patients who were found to have hearing loss were managed according to the type and severity of hearing loss.

Data analysis

Data were analysed by using SPSS version 20. Quantitative data were summarized as frequencies and percentages and presented as tables. A variable with p-value <0.05 was considered to be statistically significant.

Ethical considerations

Ethical approval for the study was obtained on 10th December 2020 from the private hospital's Ethics Committee. Written informed consent was obtained from all patients and the interview was conducted in a private room. Patient information was obtained on a confidential basis.

RESULTS

Age and sex distribution of patients

Two hundred and fifty patients with hearing loss were recruited; 115 (46%) were males and 135 (54%) were females with a female to male (F:M) ratio of 1.2:1. The largest group was aged 41-50 years (26%) (Table 1).

Causes of hearing loss

Age-related hearing loss (presbyacusis) 132(52.8%) followed by ototoxicity 26(10.4%) and chronic suppurative otitis media 26(10.4%) were the commonest causes of hearing loss (Table 2).

Lateralization of hearing loss

The majority of patients 183 (73.2%)) had unilateral hearing loss while 67 (26.8%) had bilateral hearing loss (Table 3).

Table 1. Age and sex distribution (N=250)

Age group (years)	Sex		
	Male n (%)	Female n (%)	Total n (%)
1-10	11 (61.1)	7 (38.9)	18 (7.2)
11-20	6 (42.9)	8 (57.1)	14 (5.6)
21-30	21 (60)	14 (40)	35 (14)
31-40	11 (45.8)	13 (54.2)	24 (9.6)
41-50	23 (35.4)	42 (64.6)	65 (26)
51-60	29 (64.4)	16 (35.6)	45 (18)
61-70	18 (60)	12 (40)	30 (12)
71-80	7 (43.8)	9 (56.2)	16 (6.4)
81-90	2 (66.7)	1 (33.3)	3 (1.2)
Total	115 (46)	135 (54)	250 (100)

Table 2. Causes of hearing loss (N=250)

Cause	Sex		
	Male n (%)	Female n (%)	Total n (%)
Meningitis	3 (2.6)	2 (1.5)	5 (2)
Chronic suppurative otitis media	14 (12.2)	12 (8.9)	26 (10.4)
Middle ear effusion	3 (2.6)	2 (1.5)	5 (2.0)
Noise induced	13 (11.3)	0 (0.0)	13 (5.2)
Ototoxicity	15 (13.1)	11 (8.2)	26 (10.4)
Congenital	2 (1.7)	1 (0.7)	3 (1.2)
Sudden hearing loss	17 (14.8)	5 (3.7)	22 (8.8)
Neonatal jaundice	2 (1.7)	1 (0.7)	3 (1.2)
Radiotherapy	3 (2.6)	2 (1.5)	5 (2.0)
Chemotherapy	0 (0.0)	6 (4.4)	6 (2.4)
Viruses (measles)	0 (0.0)	1 (0.7)	1 (0.4)
Presbyacusis	40 (34.8)	92 (68.2)	132 (52.8)
Others e.g., temporal bone fractures	3 (2.6)	0 (0)	3 (1.2)
Total	115 (46)	135 (54)	250 (100%)

Table 3. Hearing loss by laterality of the affected ear (N=250)

Age group (years)	Sex		
	Unilateral hearing loss n (%)	Bilateral hearing loss n (%)	Total n (%)
1-10	7 (38.9)	11 (61.1)	18 (7.2)
11-20	13 (92.9)	1 (7.1)	14 (5.6)
21-30	16 (45.7)	19 (54.3)	35 (14)
31-40	17 (70.8)	7 (29.2)	24 (9.6)
41-50	56 (86.2)	9 (13.8)	65 (26)
51-60	40 (88.9)	5 (11.1)	45 (18)
61-70	18 (60)	12 (40)	30 (12)
71-80	13 (81.3)	3 (18.7)	16 (6.4)
81-90	3 (100)	0(0.0)	3 (1.2)
Total	183 (73.2)	67(26.8)	250 (100)

Type of hearing loss among the study participants

Sensorineural hearing loss was the commonest type 214 (85.6%), followed by conductive 33 (13.2%) and mixed 3 (1.2%).

Table 4. Severity of hearing loss by sex (N= 250)

Severity of hearing loss	Sex		
	Male n (%)	Female n (%)	Total n (%)
Mild (26-40dB)	16 (13.9)	12 (8.9)	28 (11.2)
Moderate (41-55dB)	37 (32.2)	65 (48.1)	102 (40.8)
Moderately severe (56-70dB)	23 (20)	22 (16.3)	45 (18)
Severe (71-90dB)	26 (22.6)	19 (14.1)	45 (18)
Profound (91+dB)	13 (11.3)	17 (12.6)	30 (12)
Total	115 (46)	135 (54)	250 (100)

Severity of hearing loss among the study participants

The majority of the patients, 102(40.8%), had moderate hearing loss followed by both moderately severe and severe hearing loss each accounting for 45(18%) cases and the least severe type was mild hearing loss accounting for 28(11.2%) cases. Females and males had predominantly moderate hearing loss (48.1% and 32.2% respectively) (Table 4).

DISCUSSION

In recent decades, hearing loss has become one of the most important public health concerns with significant social and economic implications.[10,11] In children it causes poor intellectual and language development[3] but in adults it tends to hamper professional engagement, social life including isolation due to stigmatisation.[2]

The commonest cause of hearing loss in this study was presbyacusis (52.8%) followed by ototoxicity (10.4%) and chronic suppurative otitis media (CSOM) (10.4%). These findings are comparable to those by Shuaibu et al, where presbyacusis, ototoxicity and CSOM were the commonest causes.[2] Dissimilar findings were reported in the study conducted by Rabbani et al, where CSOM, otitis media with effusion and idiopathic sudden sensorineural hearing loss were the commonest causes of hearing loss.[12] Such disparity may be due to the relatively smaller sample size that we recruited compared to their population. On the other hand, the majority of the cases of ototoxicity in our study could be linked to use of gentamicin and quinine.

Our study found sensorineural hearing loss to be the commonest type of hearing loss followed by conductive and mixed types similar to other studies from different parts of the world.[2,13] Predominance of this type of hearing loss may be attributed to some extent by shared genetic causes and similar occurrence of other comorbidities such as diabetes, hypertension, infections, vascular, neoplastic, iatrogenic, immunological and inflammatory conditions that afflict the cochlea.

Our study found moderate hearing loss to be the predominant severity subtype (40.8%) followed by moderately severe (18%) and severe (18%). Such findings correlate with those from a study by Shuaibu et al in North Western Nigeria [2] where the majority had mild-moderate hearing loss (64.3%)[2], such similarity may be attributed to the fact that most of our patients had age-related hearing loss (52.8%) and they commonly present with mild-to-moderate hearing loss. The finding also appears to be different from what was found in a study that was conducted in Benin City, Nigeria, where mild hearing loss (44.5%) predominated.[13]

Management of patients with hearing loss is often challenging and requires a non-limited resource environment for its perfection. Most of patients with sensorineural hearing loss were treated with hearing aids fitting and vitamins supplementation (vitamin B1, B2, B6, B12 and folic acid) in addition to counselling. Those with conductive hearing loss were treated according to the underlying causes by aural toilet, antibiotics, adenoidectomy with grommet tube insertion which resulted in marked improvement after management.

Limitations

Tympanometry was not available at the health facility. The sample size was too small from which to derive population-based conclusions. The results are also from a single institution and not multicentric and therefore not generalisable.

CONCLUSION AND RECOMMENDATION

Presbyacusis was the commonest cause of hearing loss followed by ototoxicity and chronic suppurative otitis media. The majority of patients had bilateral moderate hearing loss and sensorineural hearing loss based on the pattern of hearing loss.

It is recommended that larger multicentric studies are done to increase generalizability of the findings.

Conflicts of interests: None

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Authors' contributions

ZSA contributed to study design, collected data, performed data analysis and prepared this manuscript. AAK contributed to study design, data analysis and critically reviewed this manuscript. All authors have read and approved the final manuscript.

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