Frequency of Hearing Loss in Tikrit City Population

Nada Khaleel Yaseen[1*], Areej Mahdi Hamad[2], Fatimah Omar Abdullah[3]
[1]Otolaryngologist, Tikrit university, medical collage
[2]Resident doctor at Tikrit Emergency Hospital, Salahaddin, Iraq
[3]Resident doctor at Samara'a general hospital ،Salahaddin, Iraq
Email: mailto:Drnadayaseen@tu.edu.iq

Abstract
The hearing is one of the main ways to understand and communicate with each other. The aim of our study was to determine the frequency of hearing loss and its relationship to age and gender in Tikrit city, Iraq. A cross sectional descriptive study was designed. of one hundred fifteen persons in Tikrit city. The information has been collected collect from the ENT's clinic as a convenience sample in Tikrit city for all hearing loss cases for the last 2 months and collected by a detailed history and examination by supervisor. The results showed that there was a strong relationship between gender and some types of hearing loss and the mean age of hearing loss with the strong effect of endogamy on congenital hearing loss and other problems of hearing. The study can be concluded as hearing loss is a hereditary disease. The hearing loss was observed in the 6th decades of their age (between 50th to 60th year). Equal percentage of both the gender individuals showed mild SNHL at normal and high frequency; sever SNHL; and moderate and profound mixed hearing loss. Only female individuals showed moderate to severe SNHL and bilateral with different degree. Only male individuals showed moderate to severe SNHL at high frequency and severe mixed hearing loss. From the study findings, we can recommend few suggestions. It is mandatory to visit ENT doctor and audiologist if an infant is disregarded to noise, delayed speech of your child, if there is problems in ears or in hearing, etc. For adults were working in a noisy environment, if lost some of hearing efficiency in order to prevent more loss, family history of hearing loss or hearing problems, etc. It is better to avoid marry in endogamy way

Keywords: Hearing loss, Age, Auditory brainstem response, Prevalence

1. Introduction

Hearing plays a major role in quality of life, from emotional well-being and physical health to careers and leisure activities. Hearing loss (HL), also known as hearing impairment, is a partial or total inability to hear (Alshuaib et al., 2015). A deaf person has little to no hearing. Hearing loss may occur in one or both ears. Millions of people who have hearing loss and they remain untreated, despite research showing links between untreated hearing loss and increased risk of falls, depression, anxiety, hospitalizations and even dementia. One of six adults had hearing loss (WHO, 2021). Hearing loss is defined as one of three types: conductive (involves outer or middle ear), sensorineural (involves inner ear) and mixed (combination of the two). In children, hearing problems can affect the ability to learn spoken language and in adults, it can create difficulties with social interaction and at work (Dobie and Van-Hemel, 2004). In older people, hearing loss can result in loneliness. Hearing loss can be temporary or permanent. Estimates of the prevalence of auditory dysfunction, such as hearing loss and tinnitus, vary widely based on both the method of estimation (e.g., survey or diagnostic codes) and the sample from which they are made. Drawing from a large and representative sample of U.S. civilians that included audiometric assessments, approximately 20% of U.S. citizens suffer from hearing loss, with women and African Americans exhibiting lower-than-expected rates (Lin et al., 2011).

Early identification and support are particularly important in children. For many hearing aids, sign language, cochlear implants and subtitles are useful. Lip reading is another useful skill some develop. Access to hearing aids, however, is limited in many areas of the world. Studies showed that 500 million under the age of 65 have hearing loss so it is a serious problem that we should try to find the way to help people with this disease or even try to reduce the incidence of its occurrence (Belmont et al., 2010). Aging and chronic exposure to loud noises both contribute to hearing loss (Belmont et al., 2012). Very scanty reports were available from Iraq. With this background, the aim of our study was to determine the frequency of hearing loss and its relationship to age and gender in Tikrit city, Iraq.

2. Material and Methods

Collection of data

Steps in hearing problems evaluation in a patient is depicted in the Figure 1. Detailed history was taken from each patient. Each patient was clinically examined. The children with hearing problems were evaluated by tympanometry test and auditory brainstem response (ARB). The adult with hearing loss problems were evaluated by the pure-tone audiometry (PTA) and tympanometry test.

doi.org/10.31838/hiv22.02.681 Received: 17. 06.22, Revised:30.07.22, Accepted: 18.08.22

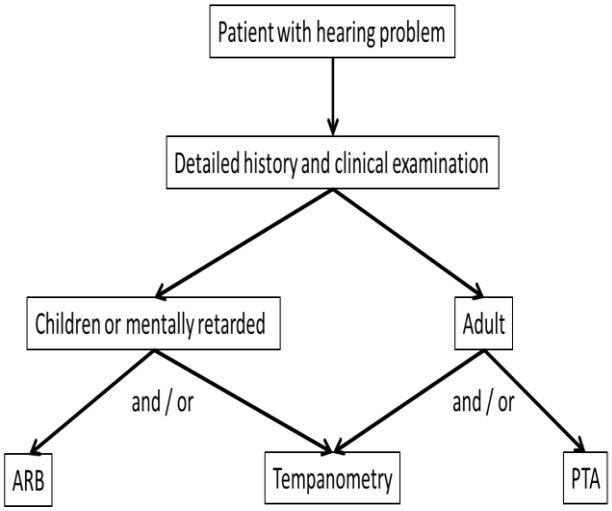

Figure 1: Steps involved in the evaluation of hearing problems in patients. ARB: Auditory Brainstem Response; PTA: Pure-tone audiometry

3. Results

In the present study, the frequency of hearing loss and its relationship to age and gender were evaluated. The prevalence of hearing loss is depicted in Figure 2. About 99.95 % individuals showed normal hearings and only 0.05 % individuals showed hearing loss.

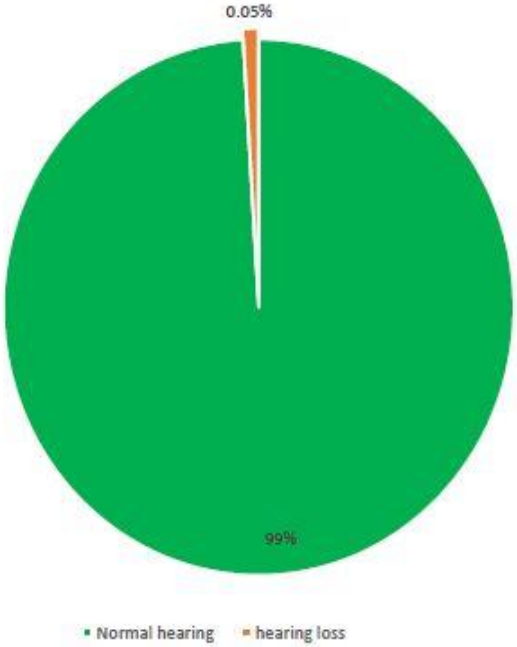

Figure 2: Hearing loss percentage from Tikrit population

Gender based distribution of normal hearing and types of hearing loss in adults is depicted in the Figure 3. Around 17.99% and 16.50% of male and female individuals showed normal hearing, respectively. Equal percentage of both the gender individuals showed mild SNHL at normal and high frequency; sever SNHL; and moderate and profound mixed hearing loss. Only female individuals showed moderate to severe SNHL (2.90%) and bilateral with different degree (7.46%). Only male individuals showed moderate to severe SNHL at high frequency (2.90%) and severe mixed hearing loss (1.50%).

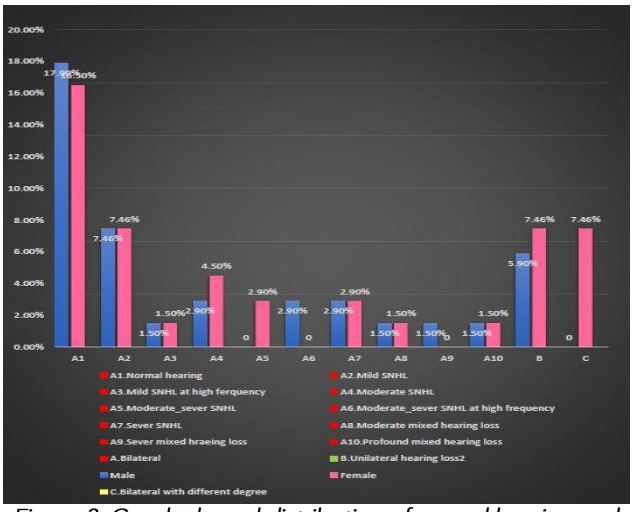

Figure 3: Gender based distribution of normal hearing and types of hearing loss in adult

Gender based distribution of normal hearing and types of hearing loss in children is depicted in Figure 4. More than double male (58.30%) individuals showed normal hearing as compared to females (25.00%). Around 41.60% and 16.60% males showed profound SNHL and sever SNHL at high frequency as compared to females, respectively.

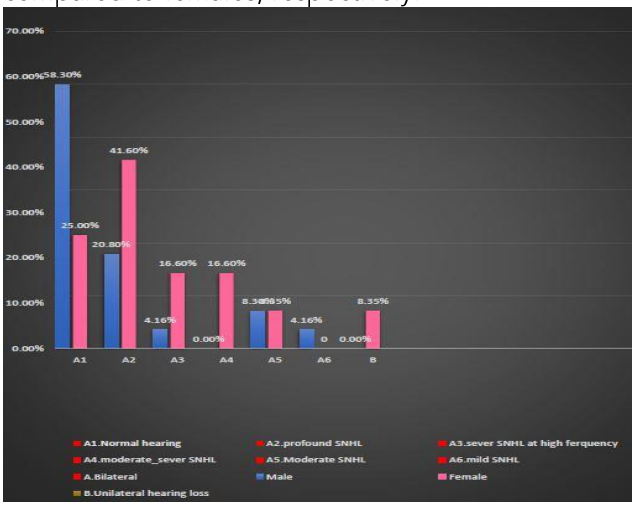

Figure 4: Gender based distribution of normal hearing and types of hearing loss in children

Age based distribution of hearing loss is depicted in the Figure 5. Around 22.37% individuals showed hearing loss in the 6th decades of their age (between 50th to 60th year).

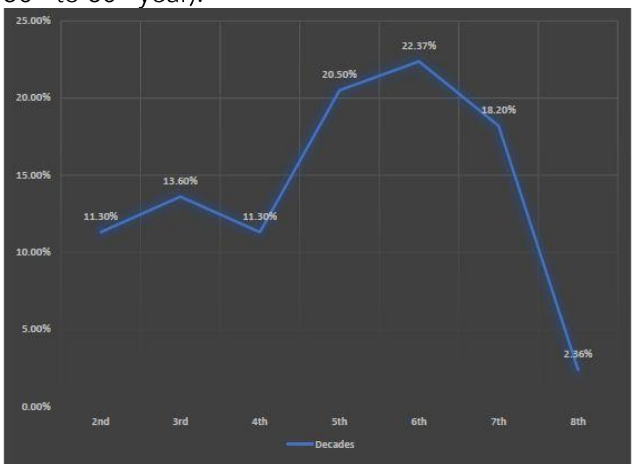

Figure 5: Age based distribution of hearing loss in decades of life

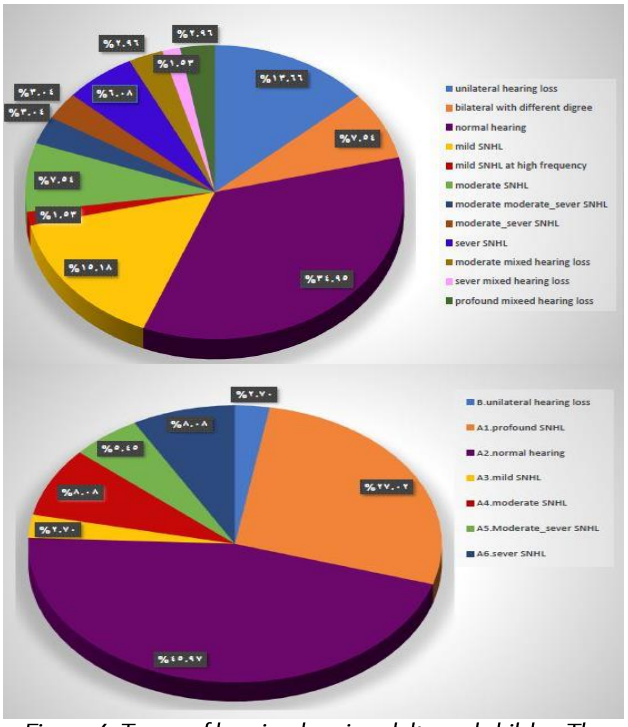

Figure 6: Types of hearing loss in adults and childrenThe types of hearing loss in adults and children are depicted in the Figure 6.

Table 1 showed the relationship between hearing loss and family history of the same disease in children. Around 72.30 % individuals showed negative history for the hearing loss. Around 52.68 % patients showed loss in hearing ability.

Table 1: The relationship between hearing loss and family history of the same disease in children

Family history	Normal hearing (%)	Hearing loss (%)	Total (%)
+ ve	05 (13.88 %)	05 (13.88 %)	10 (27.70 %)
- ve	12 (33.40 %)	14 (38.88 %)	26 (72.30 %)
Total	17 (47.28 %)	19 (52.68 %)	36 (100 %)

The types of tympanograms in children and adults is depicted in the Figure 7. The negative pressure peak, and shallow and deep peaks were absent in the children tympanogram. Children showed flat tympanogram (48.65%) and normal peak (51.35%) only.

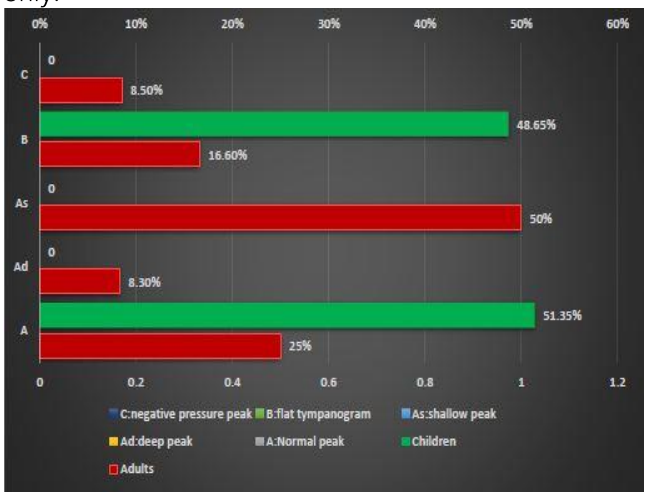

Figure 7: Types of tympanograms in children and adults

Treatment methods in hearing loss patients with their percentage are represented in the Figure 9. Bilateral moderate power hearing aid, treat otitis media, cochlear implant, speech therapy, unilateral high power hearing aid, and bilateral high power hearing aid were found to be 11.1%, 30.5%, 16.6%, 36.11%, 2.77% and 33.3%, respectively.

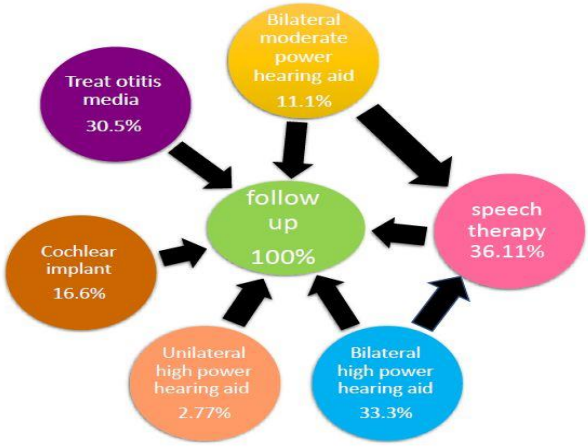

Figure 8: Treatment methods in hearing loss patients with their percentage

4. Discussion

Swan et al., (2017) studied prevalence of hearing loss and tinnitus in a cohort of Iraq and Afghanistan Veterans (IAV) with common post-deployment conditions, including traumatic brain injury (TBI), post-traumatic stress disorder (PTSD), and other typical post-concussive conditions such as headaches and vertigo/dizziness. The retrospective observational study used data from the national Veterans Health Administration (VA) data repository from fiscal years 2001–2014. Among IAV, 570,332 were included in the final analysis. Of these, 7.78% of these were diagnosed with hearing loss alone, 6.54% with tinnitus alone, and 6.24% with both hearing loss and tinnitus. The present study is accordance with this report. The most cases who were suspected to have hearing loss are normal, but the most common type which is related to male gender is mild sensory neural hearing loss (SNHL) and for females is mild sensory neural hearing loss with unilateral hearing loss and bilateral hearing loss with different degree.

Other sensory-related conditions were significantly associated with the diagnoses of auditory dysfunction examined in this study. Vertigo/dizziness, visual problems, jaw pain, and otologic pain were each associated with increased rates of auditory dysfunction. It has been established that the auditory pathways are susceptible to injury and/or dysfunction after TBI (Lew, 2007). The associations with mild TBI are not as clearly defined; however, several studies beside our own support that exposure to blast is associated with an increased likelihood of auditory dysfunction (Lew, 2007, Lew et al., 2009, Pogoda et al., 2012, Sayer et al., 2008).

Swan et al., (2017) found that auditory dysfunction, specifically hearing loss and tinnitus, was also

significantly associated with age and gender factors. Similar reports were published by various authors (Shargorodsky et al., 2010; Lin et al., 2011; Wells et al., 2014; Pugh et al., 2016). Previous research has found that the prevalence of each of these conditions increases with age (Shargorodsky et al., 2010). Similarly, women and African-Americans were significantly less likely to have either or both hearing loss or tinnitus, which, at least for sex, may be consistent with occupational hazard exposure differences (Lin et al., 2011).

5. Conclusions

The study can be concluded as hearing loss is an heridatory disease. The hearing loss was observed in the 6th decades of their age (between 50th to 60th year). Equal percentage of both the gender individuals showed mild SNHL at normal and high frequency; sever SNHL; and moderate and profound mixed hearing loss. Only female individuals showed moderate to severe SNHL and bilateral with different degree. Only male individuals showed moderate to severe SNHL at high frequency and severe mixed hearing loss. From the study findings, we can recommend few suggestions. It is mandatory to visit ENT doctor and audiologist if an infant is disregarded to noise, delayed speech of your child, If there is problems in ears or in hearing, etc. For adults were working in a noisy environment, if lost some of hearing efficiency to prevent more loss, family history of hearing loss or hearing problems, etc. It is better to avoid marry in endogamy way.

References

Lethbridge-Cejku, M., Schiller, J.S., and Bernadel, L. (2004). Summary health statistics for U.S. adults: national health inverview survey, 2002. Vital Health Stat. 10, 1–151.

Bess, F.H., Lichtenstein, M.J., Logan, S.A., Burger, M.C., and Nelson, E. (1989). Hearing impairment as a determinant of function in the elderly. Journal of the American Geriatrics Society, 37(2), 123-128.

AlMashhadani HA. Corrosion protection of pure titanium implant in artificial saliva by electro-polymerization of poly eugenol. Egyptian Journal of Chemistry. 2020 Aug 1;63(8):2803-11.

Weinstein B.E., Sirow L.W., and Moser S. (2016). Relating Hearing Aid Use to Social and Emotional Loneliness in Older Adults. American journal of audiology, 25(1), 54-61.

Nachtegaal J., Smit J.H., Smits C. A.S., Bezemer P.D., van Beek J. H., Festen J.M., and Kramer S.E. (2009). The association between hearing status and psychosocial health before the age of 70 years: results from an internet-based national survey on hearing. Ear and hearing, 30(3), 302-312.

Weinstein, B. E., Sirow, L. W., and Moser, S. (2016). Relating Hearing Aid Use to Social and Emotional Loneliness in Older Adults. American journal of audiology, 25(1), 54-61.

Lin, F. R., Yaffe, K., Xia, J., Xue, Q. L., Harris, T. B., Purchase-Helzner, E., ... & Health ABC Study Group. (2013). Hearing loss and cognitive decline in older adults. JAMA internal medicine, 173(4), 293-299.

A.A. Swan, J.T. Nelson, B. Swiger, C.A.Jaramillo, B.C. Eapen, M. Packer, M.J. Pugh. Prevalence of hearing loss and tinnitus in Iraq and Afghanistan Veterans: A Chronic Effects of Neurotrauma Consortium study. Hearing Research, Volume 349, June 2017, Pages 4-12

F.R. Lin, J.K. Niparko, L. Ferrucci. Hearing loss prevalence in the United States. Arch. Intern. Med., 171 (2011), pp. 1851-1852

J. Shargorodsky, G.C. Curhan, W.R. Farwell. Prevalence and characteristics of tinnitus among US adults. Am. J. Med., 123 (2010), pp. 711-718,

M.J.V. Pugh, E.P. Finley, L.A. Copeland, C.-P. Wang, P.H. Noel, M.E. Amuan, H.M. Parsons, M. Wells, B. Elizondo, J.A. Pugh. Complex comorbidity clusters in OEF/OIF veterans: the polytrauma clinical triad and beyond. Med. Care, 52 (2014), pp. 172-181,

M.J. Pugh, E.P. Finley, C.-P. Wang, L.A. Copeland, C.A. Jaramillo, A.A. Swan, C.A. Elnitsky, L.K. Leykum, E.M. Mortensen, B.A. Eapen, P.H. Noel, J.A. Pugh, TRACC Research Team. A retrospective cohort study of comorbidity trajectories associated with traumatic brain injury in veterans of the Iraq and Afghanistan wars. Brain Inj., 30 (2016), pp. 1481-1490,

H.L. Lew. Auditory dysfunction in traumatic brain injury. J. Rehabil. Res. Dev., 44 (2007), pp. 921-928.

H.L. Lew, D.W. Garvert, T.K. Pogoda, P.-T. Hsu, J.M. Devine, D.K. White, P.J. Myers, G.L. Goodrich. Auditory and visual impairments in patients with blast-related traumatic brain injury: effect of dual sensory impairment on Functional Independence Measure. J. Rehabil. Res. Dev., 46 (2009), pp. 819-826

T.K. Pogoda, A.M. Hendricks, K.M. Iverson, K.L. Stolzmann, M.H. Krengel, E. Baker, M. Meterko, H.L. Lew. Multisensory impairment reported by veterans with and without mild traumatic brain injury history. J. Rehabil. Res. Dev., 49 (2012), p. 971

N.A. Sayer, C.E. Chiros, B. Sigford, S. Scott, B. Clothier, T. Pickett, H.L. Lew, Characteristics and rehabilitation outcomes among patients with blast and other injuries sustained during the Global War on Terror. Arch. Phys. Med. Rehabil., 89 (2008), pp. 163-170.

Naseeb, I., Almashhadani, H. A., Macadangdang Jr., R. R., Ullah, S., Khan, M. F., Kamran, M., Qureshi, N., & Naseeb, F. (2022). Interfacial polymerization synthesis of polypyrrole and sodium metavanadate (PPy/NaVO3) composite as an excellent performance electrode for supercapacitors. Results in Chemistry, 4, 100446.

F.R. Lin, J.K. Niparko, L. Ferrucci. Hearing loss prevalence in the United States. Arch. Intern. Med., 171 (2011), pp. 1851-1852

https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss

Alshuaib, W. B. , Al-Kandari, J. M. , & Hasan, S. M. (2015). Classification of Hearing Loss. In (Ed.),

Update On Hearing Loss. IntechOpen. https://doi.org/10.5772/61835
Dobie RA, Van Hemel S, National Research Council (US) Committee on Disability Determination for Individuals with Hearing Impairments; Hearing Loss: Determining Eligibility for Social Security Benefits. Washington (DC): National Academies Press (US); 2004. 7, Hearing Loss in Children. Available from: https://www.ncbi.nlm.nih.gov/books/NBK207837/
Belmont PJ, Schoenfeld AJ, Goodman G. Epidemiology of combat wounds in Operation Iraqi Freedom and Operation Enduring Freedom: orthopaedic burden of disease, J Surg Orthop Adv., 2010, vol. 19 1(pg. 2-7)
Belmont PJJr, McCriskin BJ, Sieg RN, et al. Combat wounds in Iraq and Afghanistan from 2005 to 2009, J Trauma Acute Care Surg, 2012, vol. 73 1(pg. 3-12)

Appendix:

Questionnaire for adult:

1. Name:
2. Age:
3. Gender:
4. Addrees :
5. Occupation:
6. Chief complain:

History of associated symptoms:
1.vertigo YES NO
2.Ear discharge: YES NO
3.Tinnitus: YES NO
Medical history:
1. Diabetes mellitus: YES NO
2. Hypertension: YES NO
3. Others: ……..
Drug history: use of the following drugs:
1. Lasix: YES NO
2. Aspirin: YES NO
3. Beta blockers: YES NO
Surgical history:
Mastoidectomy: YES NO
Family history of hearing loss: YES NO

Questionnare for children:

1. Name: ……
2. Age: ……...
3. Gender: ……
4. Address: ……
5. Occupation: ……..
6. Chief complain: ……

Prenatal & anti natal history:
1. TORCH infection: YES NO
2. Type of delivery:
Vaginal
Cesarean section:
_ Maternal cause (previous Cesarean section)
_ Fetal causes (fetal distress, malpresentation)
3. Type of feeding:
Breast feeding
Bottle feeding
4. Did the baby infect with viral infection:
YES: (Measles, mumps)
NO
5. Did the baby suffer from one of the following conditions:
Jaundice
Blood exchange
Kernicterus
Medical history:
Drug history: did the baby take garamycin
Family history of hearing loss: YES NO