

## BETTER LATE THAN NEVER: IDENTIFICATION OF CHILDREN WITH HEARING LOSS IN PAKISTAN

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### ABSTRACT

**Objectives:** To ascertain the prevalence of late detection of hearing impairment (HI) among the children of Pakistan. It aimed at identification of children with hearing loss.

**Study Design:** Cross sectional survey.

**Place and Duration of Study:** The study was conducted at special schools in three major cities of Pakistan Rawalpindi, Islamabad and Lahore. Duration of study was six months i.e. from March to August 2016.

**Patients and Methods:** A convenient sampling technique was adopted by collecting information through a questionnaire with 125 parents of children with impaired hearing. Children diagnosed with only HI and with no other disability were selected for the study and assessed with questionnaires filled by their parents.

**Results:** The results revealed that late detection of HI was more manifested in the age bracket of 19-24 months at 48% followed by 22% at 0-6 months. The results showed that HI was noticed in 33% cases during 0-6 months age but first professional advise was sought in the age bracket of 19-24 months in 35% cases.

**Conclusions:** The current study has established the prevalence of late detection of HI in Pakistan, as there is a significant time lag between HI being noticed and its final detection.

**Keywords:** Hearing detection, Hearing impairment, Neo natal hearing screening.

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### INTRODUCTION

The study endeavors to explain the significance of late detection of hearing impairment (HI) among children in developing countries such as Pakistan. As hearing for cognitive development plays a major role in the development of verbal communication the importance of this study cannot be understated as HI is an unseen disability leading to social isolation<sup>1</sup>. As per Barbra Dodd's speech processing chain model about 75% of contribution for language is through listening and the outcomes bear the conclusion that pre-linguistic infants combine auditory and visual speech data<sup>2</sup>. Initiatives on the premise that early diagnosis of HI in children would help them develop like other children, were launched in many developed countries<sup>3</sup>.

When HI goes unnoticed or is overlooked,

during the first language enriched crucial years of life, the gap between a HI child and his hearing peers widens in later years of life. Around one in 1,000 infants is born with major sensori-neural hearing loss (HL)<sup>4</sup>. Being an invisible disability HI is usually not detected without scheduled age-appropriate screening as an infant with HL may still react to a few environmental sounds, making parents presume that hearing falls within standard parameters<sup>5</sup>. The major factor contributing to late detection is the absence of proper neo-natal screening at hospital level. Comprehensive neo-natal screening programmes have been introduced since the mid eighties<sup>6</sup>. The feasibility of universal newborn hearing screening (UNHS) is beneficial for early identification and intervention<sup>7</sup>. Age-appropriate tests may be suggested by a consulting pediatric audiologist. Once HL is detected management should commence immediately as technology now allows infants with severe loss to be aided. Intact cochlea and auditory pathways are pre requisites for cochlear implants hence

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impairment in any way may be attributed to such uncommon causes as tumor in the eighth cranial nerve<sup>8</sup>. Research on neural plasticity suggests that a hearing device should be fixed before the auditory system has reorganized itself in such a way that the ability to gain better hearing may have passed<sup>9</sup>.

As speech and language development is acquired bi-modally hence most of the speech sounds of parents language are reflected in these initial words but not all and the child may require several years to attain perfect production of certain sounds. Auditory skill presentation is linked to age of intervention<sup>10</sup>. Where neonates are focused in high risk screening late detection remains widespread and 40-50% of neonates manifest with no risk factors for HL. Proof has arisen in the last decade to show that when HL is identified before 6 months, such children acquire better results in language and other developmental areas vis a vis those identified after six months. Within the parameters of the infant hearing programme children meeting certain criteria participated. Those included were with chronological age less than five years, had permanent bilateral hearing loss of more than twenty dB (decibel is an arbitrary unit that expresses the ratio of a measured power or pressure to a reference value), with congenital or early onset loss (before 6 months), along with consistent use of hearing technology and/or enrolment in an intervention programme emphasizing the development of spoken language, absence of complex medical and developmental disabilities<sup>11</sup>. Impact of learning can be ascertained in developing speech among HI children as learning is remembering associations. Depending on the severity of HL such children mostly are unable to hear speech sounds classified as quiet as these sounds are not incorporated when they speak and it becomes hard to comprehend them. Academic implications for such children are typically exhibiting conditions as inadequacy in academic, reading, mathematical concepts and problem-solving<sup>12</sup>.

Impact of HI on families and quality of life is ascertained and they ought to be conscious of the likely effects of HL which is not treated and the advantages of hearing aids and such options. Denial is the first barrier to early detection at parental or caregivers level and later to intervention as hearing aid use for hearing impaired children<sup>13</sup>.

The study advances toward evidence-based practices in early identification arising out of neo natal hearing screening, as acclaimed internationally, thus leading to early intervention for infants with HI therefore minimizing the burden of disabilities, researchers must carry out a higher quality of research in this particular area of rehabilitation.

## **PATIENTS AND METHODS**

A cross-sectional survey was carried out in the Special Schools for Hearing Impaired of the federal capital Islamabad, the adjacent city Rawalpindi and the provincial capital Lahore from March to August 2016. The sample size was 125 (n=125) children which was calculated using Rao software. Convenient sampling was employed while using inclusion criteria of children with HI only without any other disability. Exclusion criteria being children with other congenital and acquired disorders. Data collection procedure used a pre tested 15 item closed ended questionnaire with each question consisting of three to five sub divisions. Data were analysed using SPSS version 20.0 for statistical analysis. Frequencies and percentages were calculated for hearing impairment being noticed and age at which first medical advice was sought and also of final detection.

## **RESULTS**

The sample size was 125 (n=125) parents of HI children. According to age ,sample was divided into three categories as 3-8 years at 50 (40%), 9-13 years 55 (44%) and 14-18 years 20 (16%). Degree of impairment in study sample was mild in 9 (7%), moderate in 13 (10%), severe in 35 (28%) and profound in 68 (54%). Major

respondents in sample were mothers 72 (58%), fathers 35 (28%) and both 18 (14%).

Figure-1 indicates that HI was noticed in 41 (33%) children during 0-6 months, in 26 (21%) during 7-12 months, in 22 (18%) during 13-18 months and in 36 (29%) during 19-24 months.

Figure-2 indicates that professional advice was first sought in the age bracket 34 (27%) children during 0-6 months, in 24 (19%) during 7-12 months, in 23 (18%) during 13-18 months and in 44 (35%) during 19-24 months.

Figure-3 indicates that HI detection in the age bracket 28 (22%) children during 0-6 months, in 22 (18%) during 7-12 months, in 15 (12%) during 13-18 months and in 60 (48%) during 19-24 months.

## DISCUSSION

In order to gain an insight into prevalence and causes of HL in rural Pakistani children, a study to generate population based data was carried out in Sialkot District, Punjab. This was a community based screening program to ascertain HI children and highlighted the existence of HI in rural Pakistan. The study determined the occurrence of congenital hearing loss in which roughly 60% cases were originating due to genetic causes<sup>13</sup>. The study warned that Pakistan's population is anticipated to bulge to 350 million by 2050 which would have a bearing on resources for the HI children requiring an immediate consideration of the scale of the problem<sup>14</sup>. Pakistan is beset with a propensity in cultural terms for indulging in consanguineous marriages which is afflicted with significantly greater occurrence of disorders which are recessively inherited<sup>15</sup>.

The American Academy of Audiology endorses detection of HL in early childhood and school aged populations using evidence based hearing screening methods<sup>16</sup>. Screening procedures in most of the countries are applied consistently henceforth confirmation of HI by nine months of age was associated with higher adjusted for language as compared with non-

verbal ability<sup>17</sup>. Screening of neonates was initiated in the developed countries after the eighties as it was perceived that in order for children with HL to maximize their potential it was imperative, based on certain principles, that the necessary resources and wherewithal be accessible<sup>18</sup>. Separate protocols are recommended for neonate intensive care units (NICU) and well-baby nurseries. The protocol is that for neonates not clearing automated ABR in the NICU, such neonates be straightaway referred for being screened again to an audiologist. Wherever necessitated and for optimizing results an audiologist may carry out a wide ranging ABR inclusive assessment<sup>19</sup>. Pediatric audiologist must be engaged in ideal conditions for the said task that is of careful evaluation of HI<sup>20</sup>.

Lack of any pertinent material on neonatal screening led to informal discussions with health professionals who spoke on condition of anonymity, wherein it emerged that no neonatal system of screening for HI exists in the government run hospitals in Lahore, Rawalpindi and Islamabad accommodating the general public hailing from the periphery also<sup>21</sup>. The commendable action taken by the Punjab Government for improving the health care system with special reference to HI children has been reflected in operations carried out in Lahore at the Children Hospital Lahore, with the assistance and cooperation of the Special Education department where fourteen HI children had cochlear implantation done. The estimated expense incurred on a single operation is Rs 1.5 million and it was planned to carry out 115 more such implantations during the fiscal year ending June 2016. Some of the private hospitals have extensive neonatal screening adopted in their set ups but it is exclusively limited to privileged strata.

The study has its limitations as it was conducted in special schools of Rawalpindi, Islamabad and Lahore. To establish the feasibility and effectiveness of hospital-based UNHS a programme for the early detection of permanent congenital or early-onset HI was carried out in

Nigeria<sup>22</sup>. As part of the immediate post-delivery examination screening was established as necessary to ensure that the newborn had no detectable hearing abnormality that could later impair normal speech and language development. The study reinforces the fact that as other developing countries have successfully researched and introduced neonatal hearing screening the same can be replicated in Pakistan. The majority of Pakistan's population resides in the rural areas where congenital hearing loss is frequently indicated hence such rural based infants are susceptible to HI<sup>23</sup>. The clinical society in developed countries has recognized the implications of early detection and management for several years and it is high time that the professionals affiliated with this field in Pakistan appreciate the sensitivity of the issue<sup>24</sup>.

## CONCLUSION

The current study has established the prevalence of late detection of HI in Pakistan, as there is a significant time lag between HI being noticed and its final detection.

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## CONFLICT OF INTEREST

The authors of this study reported no conflict of interest.

## REFERENCES

- Mumtaz N, Butt AK. Parental Response to Benefits of Early Detection in Hearing Impaired Children in Pakistan. *J Riphah Coll Rehab Sci* 2013; 1(1): 17-20.
- Dodd B. *Differential diagnosis and treatment of children with speech disorder*. John Wiley & Sons 2013 May 30.
- Turkington C, Harris J. *The encyclopedia of the brain and brain disorders*. Infobase Publishing 2010 May 12.
- Ulusoy S, Ugras H, Cingi C, Yilmaz HB, Muluk NB. The results of national newborn hearing screening (NNHS) data of 11,575 newborns from west part of Turkey. *Eur Rev Med Pharmacol Sci* 2014 1; 18(20): 2995-3003.
- Cole EB, Flexer C. *Children with hearing loss: Developing listening and talking, birth to six*. Plural Publishing; 2015 Aug 3.
- Cornel M, Rigter T, Weinreich S, Burgard P, Hoffmann GF, Lindner M, et al. Newborn Screening in Europe; Expert opinion document. *Eur J Hum Genet* 2014; 22: 12-7.
- Rai N, Thakur N. Universal screening of newborns to detect hearing impairment—Is it necessary?. *Int J Pediatr Otorhinolaryngol* 2013; 77(6): 1036-41.
- Pimperton H, Kennedy CR. The impact of early identification of permanent childhood hearing impairment on speech and language outcomes. *Archives of disease in childhood* 2012: archdis child-2011.
- Norrix LW, Velenovsky DS. Auditory neuropathy spectrum disorder: A review. *J Speech Lang Hear* 2014; 57(4): 1564-76.
- Shamir A, Korat O, Fellah R. Promoting vocabulary, phonological awareness and concept about print among children at risk for learning disability: can e-books help?. *Reading and Writing* 2012; 25(1): 45-69.
- Ciorba A, Bianchini C, Pelucchi S, Pastore A. The impact of hearing loss on the quality of life of elderly adults. *ClinInterv Aging* 2012; 7(6): 159-63.
- Khan SR, Akhtar AS. *The Military and Denied Development in the Pakistani Punjab: An Eroding Social Consensus*. Anthem Press 2014 Nov 1.
- Elahi MM, Elahi F, Elahi A, Elahi SB. Paediatric hearing loss in rural Pakistan. *Otolaryngol Head Neck Surg* 1998; 27(6): 348.
- Bongaarts J, Sathar ZA, Mahmood A. Population trends in Pakistan. *Population Council Book Series* 2013; 1(1): 13-23.
- Ajaz M, Ali N, Randhawa G. UK Pakistani views on the adverse health risks associated with consanguineous marriages. *J Community Genet* 2015; 6(4): 331-42.
- Tye-Murray N. *Foundations of aural rehabilitation: Children, adults, and their family members*. Nelson Education 2014 Feb 22.
- Kennedy CR, McCann DC, Campbell MJ, Law CM, Mullee M, Petrou S, et al. Language ability after early detection of permanent childhood hearing impairment. *N Engl J Med* 2006; 354(20): 2131-41.
- Olusanya BO, Chapchap MJ, Castillo S, Habib H, Mukari SZ, Martinez NV, et al. Progress towards early detection services for infants with hearing loss in developing countries. *BMC health services research* 2007; 7(1): 1.
- Gilbey P, Kraus C, Ghanayim R, Sharabi-Nov A, Bretler S. Universal newborn hearing screening in Zefat, Israel: the first two years. *Int J Pediatr Otorhinolaryngol* 2013; 77(1): 97-100.
- Holte L, Walker E, Oleson J, Spratford M, Moeller MP, Roush P, et al. Factors influencing follow-up to newborn hearing screening for infants who are hard of hearing. *Am J Audiol* 2012; 21(2): 163-74.
- World Health Organization. *Every newborn action plan and postnatal care of mother and newborn: report of a regional meeting*, Colombo, Sri Lanka 11-13, 2014.
- Khan MI, Mukhtar N, Saeed SR, Ramsden RT. The Pakistan (Lahore) cochlear implant programme: issues relating to implantation in a developing country. *J Laryngol* 2007; 121(08): 745-50.
- Bush ML, Bianchi K, Lester C, Shinn JB, Gal TJ, Fardo DW, et al. Delays in diagnosis of congenital hearing loss in rural children. *J Pediatr* 2014; 164(2): 393-7.
- Watkin P, Baldwin M. The longitudinal follow up of a universal neonatal hearing screen: the implications for confirming deafness in childhood. *Int J Audiol* 2012; 51(7): 519-28.