

## Original Article

## BENEFITS OF EARLY DETECTION AMONG HEARING IMPAIRMENT IN CHILDREN; CONTEMPORARY PARENTAL RESPONSE

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### Abstract

**Background:** Hearing impairment (HI) refers to partial or complete hearing loss in one or both ears due to neurological or structural damage to any part of ear. This umbrella term covers many forms of HI that varies across types, severity and area of affected anatomical structure. Hearing loss (HL) being a form of invisible disability often goes undiagnosed which hinders early intervention (EI) causing delays in speech- language development.

**Objectives:** This study was aimed to determine awareness among parents regarding benefits of timely detection of hearing impairment.

**Methodology:** A cross-sectional survey was conducted on a sample of 125 parents of hearing impaired children. Subject sample was selected through convenient sampling from special education centers for HI in Lahore, Islamabad and Rawalpindi. Data was analyzed by using SPSS version 20.

**Results:** Data analysis revealed agreement of 119 (95.2%) parents and disagreement of 5 (4%) parents with significance of early detection of HI.

**Conclusion:** Parental awareness regarding importance of early detection of HL is evident in this study. Further studies are required to establish the relationship between timely detection of HI along with appropriate age range for remediation.

**Keywords:** Hearing Impairment, Hearing loss, Early Intervention, Speech-language development

### Introduction

Hearing sense is crucial to communication as it provides a foundation to speech and language development. <sup>(1)</sup> A person deprived of this sense due to any reason suffers a range of difficulties in verbal communication. Natural acquisitions of speech and language require fully functioning hearing mechanisms that get compromised in extreme degrees of hearing loss i.e. 71 decibels (dB) or greater. <sup>(2)</sup> Extremes of HI cause deafness and difficulties in hearing to an extent that cannot be overcome by any type of amplification devices hence causing difficulty in oral communication development. <sup>(3)</sup> HL can come at pre-lingual or post-lingual stage. In early life, appearance of reduced auditory sensitivity impacts negatively upon progress in language, verbal communication and perception. The damaging outcomes of early HL can considerably be overcome through opportune intervention. <sup>(4)</sup>

Categorization of HI shows variance on the basis of its lateralization, physiological condition of hearing mechanism and severity measured in decibels. <sup>(5)</sup> HI can occur unilaterally or bilaterally with its severity levels mild, moderate, severe or profound depending upon degrees of HL. HI can occur either due to conductive HL or sensorineural HL or both. Onset of HI in children and adult is more prevalent in low income countries. <sup>(16)</sup> Studies indicate that impacted wax, otitis media and similar disorders might be the

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cause of increased rates of moderate to moderately severe HL in developing countries. <sup>(17,18)</sup>

Earlier detection of HL before first birthday presents a better prognosis with early intervention (EI) in comparison to those who are diagnosed later. In a pre-lingually HI child age is a significant factor of the advantage acquired through cochlear implant as the sooner this is done the child encounters an environment of auditory stimulus which by itself allows the HI child to comprehend and participate actively in verbal communication. It is crucial that prior to a HI child reaching two years he is sufficiently exposed to an environment of verbal communication to acquire adequate verbal communication skills. <sup>(6)</sup>

According to W.H.O 5% of world's population i.e. 360 million people suffer from incapacitating HL and among them 32 million are children. <sup>(24)</sup> As HL does not carry any visible signs of disability and as a HI infant can respond to few environmental sounds which make it difficult for parents to notice HL in their child. <sup>(7)</sup> In this situation age appropriate hearing screening tests in scheduled medical check-up of infant can help in early detection which can benefit a child from EI. <sup>(8)</sup>

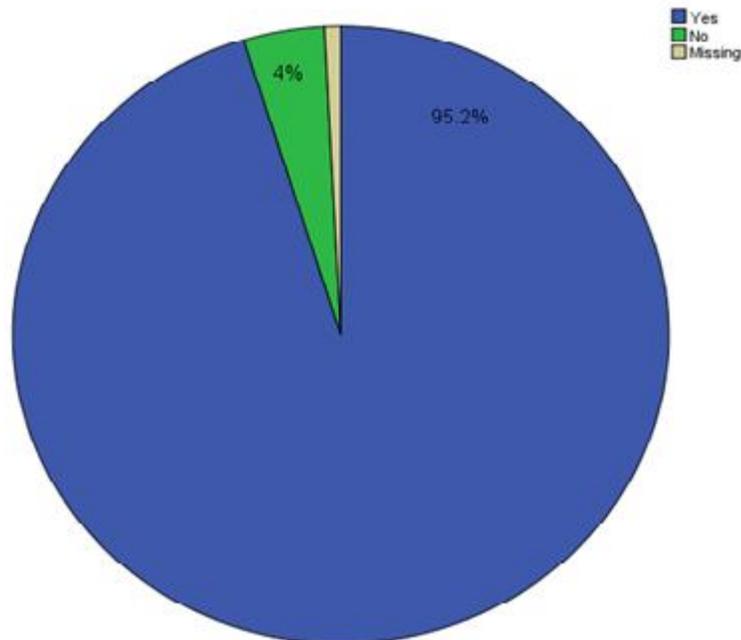
### Material & Methods

Research data was collected from Islamabad, Rawalpindi and Lahore. Sample of 125 children was drawn from special schools for hearing impaired in said cities. Children with HL with no other disability were selected for this study. Children with other disabilities- congenital or acquired were excluded at the time of data collection. After sample selection, questionnaires were filled by parents of those hearing impaired children.

### Results

This retrospective research was aimed to determine parental awareness regarding benefits of early detection of hearing impairment in children. A cross-sectional survey was conducted to meet the desired objective.

Results revealed positive response of parents regarding significance of early detection of hearing loss in their children. Parental response was evaluated on a pre-designed questionnaire. One subject was dropped from study due to missing response. It was also observed that 119 (95.2%) of parents signified early detection as positive. However, Five parents (4%) responded in negation (Figure 1).



**Figure 1-I: Pie chart showing response percentages to Question “Do you feel your child would have benefited from early detection?”**

### Discussion

Significance of benefits concerning early detection of HI can be seen in high percentage i-e 95.2% of positive parental responses. Positive outcome of parents suggests that their awareness regarding timely detection of HI can help improve quality of life towards their children.<sup>(9)</sup> Growth in understanding of the functional and morphological aspects of the auditory system along with awareness of consequent emotional and social complexities,

coupled with technological advancements in hearing, have resulted in positive attitudinal changes.<sup>(7,19)</sup> In developed countries it is axiomatic that detection and treatment of HI should be initiated as early as possible.<sup>(19)</sup> Beneficial effects on speech and language development of children with permanent childhood hearing impairment (PCHI) were seen when neonatal hearing screening was done and EI was provided.<sup>(8,21)</sup> In Germany, following a rule by the Federal Joint Committee, all newborn children get entitled to

hearing screening.<sup>(20)</sup> In many European nations Universal newborn hearing screening (UNHS) is either legally regulated (nationally or regionally) or recommended.<sup>(20)</sup>

Many developing countries had been taken HI grossly without giving consideration to variability of speech-language problems across varied degrees or severity of hearing loss.<sup>(10)</sup> Speech processing chain given by Barbra Dod explains variations in phonological systems of HI children due to variance in severity and types of HL eventually causing problems in speech-language development.<sup>(11)</sup> It has been evidenced that children with even sensorineural hearing loss develop improved language skills just with initiation of early intervention (EI) services at an early age.<sup>(22)</sup> A longitudinal study was conducted to determine impact of EI program on language development of children with permanent HL. Results of this study concluded that children enrolled in EI program prior to 6 months of age were more likely to develop and maintain age appropriate language abilities overtime at baseline as compared to those who joined at or after 6 months age. Although significant language progress was observed in children who got enrolled at or after age of 6 months yet low base-line skills were reported irrespective of severity of HL.<sup>(22)</sup>

In another retrospective/prospective mixed comparative study on a homogenous cohort of early ( $\leq 12$  months) identified and late ( $> 12$  months to  $< 5$  years) identified HI children similar results were seen.<sup>23</sup> In this study it was found that children with varied degrees of HL (with no other associated disability) who were diagnosed early, fitted with amplification devices by 3 months, started taking Auditory verbal (AV) intervention by 6 months and experienced cochlear implantation by 18 months (if required) were more capable to show normal speech-language milestones rather than catching up their normal hearing peers by 3 years of age.<sup>(24)</sup> All children in this study by 5 years age acquired normal language skills with typical speech up to 96%.<sup>(24)</sup>

HL with early detection can pave way for EI that in the longer run help reduces the gap between chronological and actual functional development of speech-language milestones.<sup>(9)</sup> Understanding aspects of social interactions in HI children can direct parents to interventional strategies which may help improve their children's QOL.<sup>(10)</sup> Children with congenital HI

improve better if detection of HL is done by age of 6 months along with suitable intervention.<sup>(12)</sup> Only earlier detection of hearing loss with universal neonatal hearing screening<sup>(13,14)</sup> can reduce disturbances caused due to late diagnosis of HI hence delayed provision of intervention.<sup>(15)</sup> Though it is not necessary that all types of impairments in hearing manifest itself in neonatal stage therefore it is essential to complement screening programs by diagnostic and interventional services when the first signs of impairment are observed post-natally.

### Conclusion

Present study shows that higher numbers of parents were aware about benefits of early detection of child which highlights increasing demand of timely interventional strategies. In Pakistan scarcity of protocols for early detection of HI mean that majority of neonates with HL will not be identified early. Considering public health perspective, finding of current study suggests that to initiate appropriate interventions it is essential to pay more attention to the early detection of HI. With technological advancement refinement in hearing testing and amplification devices is occurring to assist larger number of people with HL. Findings of current study suggest that early detection of severe or profound HI can help minimize adverse effects of HI on speech and language development if accompanied with early intervention strategies. In addition, further research will be conducted to explore the relation between early detection and age to get remedial treatment.

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**Author's Contribution:**

**Nazia Mumtaz:** Conception and design of the work, acquisition, analysis, interpretation of data for the work, Drafting the work and revising it critically for final approval. Accountable for all aspect of content.

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