

Need for Structured Early Detection and Identification Program for Hearing Impairment

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Abstract:

Every year over 100,000 new born babies are born with hearing deficiency. World Health Organization (WHO) estimates that around 60% of childhood hearing loss could be avoided through preventable measures. Studies have found that children who received earlier amplification or cochlear implantation had better language outcomes. Critical period for language learning is within the first 36 months of life. Late detection of significant hearing impairment in infants and young children results in permanent disability. Early detection and consequent treatment leads to better speech development in children, enhanced scholastic achievements in school, and limitless professional opportunities. The program initiated by the Indian Academy of Pediatrics (IAP) in 2003, is one of the largest programs with a unique centralized screening facility. It includes 20 major hospitals in Cochin, Kerala (South India), with maternity units. Government of India initiated efforts towards prevention and control of deafness in which neonatal hearing screening at a grass-roots level was envisioned as NPPCD. There is need for implementation of universal New Born Hearing Screening plan at all level to provide effective treatment at the earliest opportunity, thereby reducing suffering due to the impairment which can eventually improve the linguistic and educational outcomes for the child and reduce overall economic burden in India.

Key Words

Hearing loss, amplification, cochlear implant, early detection

BACKGROUND:

Hearing is the key to learning spoken language, performing academically, and engaging socially for children. Hearing loss poses a barrier to education and social integration. 63 million people (6.3%) suffer from significant auditory loss, in India. Four in every 1000 children suffer from severe to profound hearing loss. Every year over 100,000 new born babies are born with hearing deficiency. Rural areas have a high prevalence of hearing loss than urban areas. [1] The estimated prevalence of adult-onset deafness in India was found to be 7.6% and childhood onset deafness to be 2% [1]. Hearing disability has a higher prevalence in children aged 0–4 years (0.60%) and 5–9 years (0.28%) than all other disabilities (0.32%) in India [2]. Over 5% of the world's population – or 466 million people – has disabling hearing loss (432 million adults and 34 million children) [3]. The World Health Organization (WHO) estimates that around 60% of childhood hearing loss could be avoided through preventable measures. Studies have found that children who received earlier amplification or cochlear implantation had better language outcomes [4]. Thus, the true prevalence is no doubt overall much higher. There is a scattered data available regarding estimates of these suffering from mild to moderate hearing impairment.

WHY EARLY DETECTION AND IDENTIFICATION IS REQUIRED??

The critical period for language learning is within the first 36 months of life [5]. The disturbing fact is that the average age at which a child who has a profound, bilateral, sensorineural hearing loss is identified is 24 months, while hearing impairments of lesser degrees often are identified at an average age of 48 months of age, especially in rural areas due to the poor awareness about hearing impairment and its relation with speech and language development as well as lack of infrastructure such as the non availability of ENT surgeon, audiologist, audiological equipment, and speech therapist. Thus, unnoticed or late detection of significant hearing impairment in infants and young children results in permanent disability. Different studies concluded that children with permanent hearing loss enrolled in an early intervention program before the 6

months of age developed as per with age-appropriate language skills than those who were enrolled after 6 months of age [6].

STRATEGY FOR EARLY DETECTION AND IDENTIFICATION OF HEARING IMPAIRMENT:

A probable strategy to ensure that children with hearing loss are identified and treated early is to ensure that every newborn is screened for possible hearing loss at the birth in hospital. Early detection and consequent treatment lead to better speech development in children, enhanced scholastic achievements in school, and limitless professional opportunities. This strategy has been implemented in countries such as USA, Singapore, Australia, UK, and many more [7]. Newborn hearing screening (NHS) programs were implemented in India as a part of research studies beginning in the early 1970s. Later, several hospitals established their own hearing screening programs.

AVAILABLE FACILITIES IN PRESENT ERA:

Based on studies citation, in Indian mostly newborn hearing screening facility is available only at tertiary hospitals. A centralized hearing screening facility for universal screening program was conceptualized and established in Cochin to every hospital in the city at its doorstep in this context [8]. The program initiated by the Indian Academy of Pediatrics (IAP) in 2003, is one of the largest programs with a unique centralized screening facility. It includes 20 major hospitals in Cochin, Kerala (South India), with maternity units. [9-15]. In the year 2009–2010, a total of 12416 newborns in 10 hospitals associated with All India Institute of Speech & Hearing (AIISH) were screened for hearing disorder. Of them, 1010 infants were referred for further check-up [16].

In 2006, the Government of India initiated efforts towards prevention and control of deafness in which neonatal hearing screening at a grass-roots level was envisioned as NPPCD. Under the NPPCD, funds for the execution of the program are given to the state health society and program committees of NHMs are to carry out various activities through district health societies. The role of the state committee acts to function as a supervisory and monitoring authority for smooth conduct of the strategies to prevent and control deafness [17]. The 70th World Health Assembly adopted a resolution on the prevention of deafness and hearing loss in 2017. This resolution calls

upon Member States to integrate strategies for ear and hearing care within the framework of their primary health care systems, under the umbrella of universal health coverage [3].

Way forward:

There is need to generate awareness regarding the importance of early identification of hearing impairment as well as its implication to the mass. Also there is need for implementation of universal New Born Hearing Screening plan at all level to provide effective treatment at the earliest opportunity, thereby reducing suffering due to the impairment which can eventually improve the linguistic and educational outcomes for the child and reduce overall economic burden in India.

References:

1. Garg S, Chadha S, Malhotra S, Agarwal AK (2009). Deafness: Burden, prevention and control in India. *Natl Med J India*. 22:79–81.
2. Office of the Registrar General & Census Commissioner, India. Census of India, 2011 Downloaded 2018 August 28; available from <http://www.censusindia.gov.in/2011census/C-series/c-20>. Accessed on 25th Aug 2018.
3. Deafness and *hearing loss* fact sheet from WHO: published in site on 15 March 2018 available from [http:// www.who.int > News > Fact](http://www.who.int/News/Fact) . Accessed on 2018 August 25
4. WHO Global Estimates on Prevalence of Hearing Loss. Mortality and Burden of Diseases and Prevention of Blindness and Deafness WHO. 2012. Accessed on 2018 August 28; available from: http://www.who.int/healthinfo/statistics/bod_hearingloss.pdf .
5. Snow CE, Hoefnagel-Höhle M (1978).The Critical Period for Language Acquisition: Evidence from Second Language Learning. *Child Development* Vol. 49, No. 4, 1114-1128.

6. Ching TYC (2015). Is Early Intervention Effective in Improving Spoken Language Outcomes of Children With Congenital Hearing Loss? *Am J Audiol*. 2015 Sep; 24(3): 345–348.
7. Patel H, Feldman M (2011). Universal newborn hearing Screening. *Paediatr Child Health*. 16(5): 301–305.
8. Ramkumar AE (2017). A review of neonatal hearing screening practices in India. *Journal of Hearing Science*, Vol. 7(2).
9. John M, Balraj A (2009). Neonatal screening for hearing loss: Pilot study from a tertiary care centre. *Indian J Otolaryngol Head Neck Surg*, 61: 23–26.
10. Nagarajan R, Janet D, Bala K, Binu N (2008). Establishment and evaluation of NHS program at a corporate hospital. *J Indian Speech Hear Assoc*; 22: 17–24.
11. Nallamuthu A, Selvarajan HG, Seethapathy, Jayashree Nagarajan R, Ninan B. Overcoming challenges of delivering Newborn Hearing Screening program in a tertiary care hospital in India. 7th Australasian Newborn Hearing Screening Conference, Auckland, August 2012. Accessed on 2018 August 28; available at <https://www.newbornhearingscreening.com.au/wp-content/uploads/2012/05/Sat-2B-0930-A-Nallamuthu.pdf>.
12. Office of the Registrar General & Census Commissioner, India. Census of India, 2011 Accessed on 2018 August 28; available from <http://www.censusindia.gov.in/2011census/C-series/c-20>. Html.
13. Paul AK. Early identification of hearing loss and centralized newborn hearing screening facility: the Cochin experience. *Indian Pediatr*, 2011; 48: 355–59.
14. Paul AK. Centralized newborn hearing screening in Ernakulam, Kerala: Experience over a decade. *Indian Pediatr*, 2016; 53: 15–17.
15. Rajagopalan R, Selvarajan HG, Rajendran A, Ninan B. Grandmothers' perspective on hearing loss in children and newborn hearing screening. *Indian J Otol*, 2014; 20: 2014–17.
16. Annual Report 2009-10. All India Institute of Speech and Hearing; 2009-10.
17. Singh V. Hearing in India: All aspects. *Otolaryngol Online J* 2015; 5.