

Neo-natal hearing Screening should be mandatory medical regime in India

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Abstract

The most crucial period for the acquisition of language and speech skills is generally regarded as the first 3 years of life. Sometimes, in children from the period of infancy to early childhood, hearing loss may often go undetected which can extend for a longer time. The result is that for many infants and young children who have reduced hearing sensitivity and are detected later, resulting in substantial loss of the speech and language skills. Government of India should take the initiation to start universal newborn hearing screening program at all district hospitals and medical colleges of India. Awareness about importance of newborn hearing screening is necessary on urgent basis.

Keywords: Newborn; Hearing; Screening; India.

Introduction

Hearing impairment is one of the most prevalent deficits among other sensory organs. There are almost 5-6 infants who are hard of hearing out of 1000 neonates.⁽¹⁾ In general, most of the infants are not being identified with hearing loss till they attain 2 or more years of age, by then irreversible damage would have initiated subsequently resulting in delay of acquisition of speech and language skills. Universal hearing screening programs is the one major system to decrease the burden of deafness in Indian society.

In current scenario, hearing loss is one of the most common "hidden" sensory deficits mostly seen in individuals. Basically, the degree of hearing impairment can range from minimal to profound.⁽¹⁾ Mostly individuals with moderate to profound hearing loss generally come across disabling conditions which affects their daily lifestyle. Researchers say that every 1000 children born in India, there may be 5-6 such children who cannot hear properly.⁽²⁾ According to the 2012 estimates of the World Health Organization⁽²⁾ has declared hearing loss as the second most common cause of years lived with disability (YLD) accounting for 4.7% of the total YLD. As per Indian population the much-referred prevalence data for India is around 6.3% of Indians suffering from significant auditory loss. Rural areas have a shown a significant larger number of individuals with hearing loss than urban areas.⁽¹⁾ As per National Sample Survey Organization survey, currently around 3.0 million population of India is suffering from severe to profound hearing loss, large percentage out the estimated population is from children between the ages of 0-14 years.

Importance of early identification and early intervention

While the most evident impact of childhood hearing loss is on the delayed development of speech and language skills, the condition also has an adverse

effect on overall literacy, development of social, emotional, cognitive skills including self-esteem. Untreated hearing loss is often linked with low academic achievement which can lead to lower job opportunities resulting in poor employment options later in life. For a child, having hearing loss may find difficulty in communicating with the peers, which may result in feeling of anger, stress, loneliness and emotional or psychological consequences which may have a intense effect on the family as a whole. In a broader sense, hearing loss grades context, untreated hearing loss affects the social and economic outgrowth of communities and countries.

The most crucial period for the acquisition of language and speech skills is generally regarded as the first 3 years of life. Sometimes, in children from the period of infancy to early childhood, hearing loss may often go undetected which can extend for a longer time. The result is that for many infants and young children who have reduced hearing sensitivity and are detected later, resulting in substantial loss of the speech and language skills as, it crosses the crucial period in which speech and language skills are learnt in a swift manner. There is a unison saying that hearing impairment should be identified and diagnosed as early as possible, so that the proper intervention process can utilize the neural plasticity of the entire nervous system and assist the child in acquiring the speech and language skills. Thus, early identification and intervention can prevent the fierce from psychosocial, educational, and linguistic consequences for infants or children who are identified with hearing loss before 6 months of age.

There are many committees and organizations who work exclusively to make appropriate recommendations concerning the early identification of children with, or at-risk for hearing loss and organize the newborn hearing screening programs. One of the most widely accepted committee is Joint Committee on Infant Screening (JCIH) which was established in the year

1969 which initially highlighted the fact that mass hearing screening could not be justified as there were no appropriate test procedures available at that time. As per JCIH (2007) position statement a new born hearing screening program should be screened using a physiologic measure at no later than 1 month of age.⁽³⁾ In accordance with, Salamanca Statement every child has the fundamental right to education, and must be provided with equal opportunity to achieve and maintain an acceptable level of learning. But, still neonates and infants are not routinely screened because of the lack of awareness among the medical professionals and also because there is a dearth of qualified professionals who are known as “Audiologists” in developing country like India.

When to Screen?

Hearing loss in children can be either congenital which means those with hearing loss present at birth or acquired in which hearing loss can occur as a child ages. The causes of hearing loss may include genetic which refers to the condition wherein hearing loss is much more frequent in children who are born in families with a history of consanguineous marriages or those unions between two individuals who are closely related. Congenital malformations of the ear or the auditory nerve, which can be due any of the genetic factors or environmental influences, can significantly be a leading cause of hearing loss; other conditions at birth like prematurity, low birth weight, birth asphyxia (lack of oxygen) or neonatal jaundice and can also be due to any kind of fetal infections wherein mother during pregnancy may acquire certain infections such as rubella and cytomegalovirus which lead to hearing loss in the child. In addition meningitis, mumps and measles in childhood can also result in hearing loss. There are high possibilities that these babies are considered as “High risk register” which can occur due to any of the factors. Apart from these, other determinants like Infections of the ear are quite common in children in low-resource settings leading to discharge are one of the common problem seen among the children which triggers the probability of hearing loss.

As per researchers in JCIH (2007), the prescribed formula is 1-3-6, that is, a new born must be screened before 1-month of age, confirm the diagnosis of hearing loss and provide proper rehabilitation options which can be fitting of hearing aid before 3 months, and enroll the child for early speech and language intervention before 6 months of age.⁽³⁾ The similar procedure can be followed in India with screening of every child delivered in any health care set-up, before discharging the mother and child.

Whom to approach?

Experts often termed as “Audiologists” having minimum educational qualification of graduate degree

in audiology are being provided the license to practice from Rehabilitation Council of India, qualified to contribute guidance, development, implementation, and oversight of newborn hearing screening programs. They are the professionals who screen and recommend an infant for detailed assessment who are at risk of hearing loss. The Department of Audiology and Speech Language Pathology, Amity Medical School, located in the district of Haryana, Northern India, conducts infant screening programs for hearing disorder within the campus by implementing objective measurements like Oto-Acoustic Emissions (OAE) screening, Behavioral Observational Audiometry(BOA),and subjective measurements like administering HRR screening questionnaire in order to screen the infants who are at the risk of hearing loss and provide them adequate intervention options as soon as possible. Professionals from department also visit nearby hospital set-ups and screen infants so, as to reduce the risk of hearing loss. For the individuals who can't reach to the department or nearby hospitals, camps are being conducted on regular basis in those rural areas under the guidance of qualified professionals initiating from the rural sector to urban community with the aim of creating awareness regarding the importance of newborn hearing screening, and also to identify the infants who are at the risk of hearing loss, predominantly “HRR” babies are being identified using a screening questionnaire and are recommended for detailed assessment.

How to detect hearing loss?

Hearing Impairment can be either at peripheral (cochlear) level or may involve central (brainstem) structures. Usually in hospital set-ups, there are generally two basic easily available techniques which can initiate in differentiating the two. A single test itself can't detect all failure patterns in the auditory system. Thus, use of two tests for the screening of newborns for deafness is always recommended. Testing is usually performed in two phases to detect hearing impairment. Initial phase's starts with a quick, less expensive, less invasive procedure known as “OAE” is performed first, and those who screen positive are recalled for further testing known as Auditory Brainstem Response (ABR) which has much greater sensitivity and specificity. Hence, two sequential phase screening procedure using two different electrophysiological measures, OAE and ABR enables the detection of various failure patterns and contributes more complete information about the status of the functioning of the auditory system to some extent. In Department of Audiology and Speech Language Pathology, Amity University, Haryana behavioral techniques are also being recommended for infants more than 6 months of age to detect hearing loss. These tests involve testing an infant's response to specific tones projected from different directions sound source within a sound-proof room relying on operant conditioning. When performed correctly, these tests can

yield accurate results in children as young as 6 months of age who have normal neurologic development. However, experts based on their studies have mentioned that the sensitivity value and specificity value of behavioral tests are 66.7% and 86.9% respectively, positive predictive are 5.6% and negative predictive values are 99.6%, compared to evoke OAE test. Researchers have also revealed that one of the major advantages of the later behavioral test is identification of later onset or progressive hearing impairment. The OAEs and ABR can be used separately or together. In some organizations, babies are first screened using OAEs. Babies who do not pass on the first OAE test can be given a second test using the ABR. Screening can be carried out with ABR only, OAEs only, OAEs with ABR rescreen only if OAEs failed, ABR and OAEs together. A study done by Shetty, Kooknoor and Rajalakshmi in 2016 revealed that the combined protocol of two physiological tests (OAEs and ABR) in hearing screening accounts reduced false positive response there by decreases number of referrals.⁽⁴⁾ Screening tests should be done in a quiet sound-proof room with an infant resting quietly. The preferred method for testing is to have the newborn resting quietly in his/her bassinet, although, if needed, the newborn can be held.

Pass/Fail Indications

A newborn must pass screening in both ears during one session to be considered a "pass." If the newborn fails one ear, both ears must be rescreened. If the newborn passes the screening or the rescreening and has no risk factors for late-onset or progressive hearing loss, then the screening is complete. If the newborn passes the screen and has risk factors for late-onset or progressive hearing loss, then the newborn's hearing should be followed during early childhood.^(3,5)

Status of Newborn Hearing Screening in India

In present context India, as a country has been successful in decreasing the percentage of mortality rates, but on the other side the burden of disability has risen down drastically among a couple of years. Many disabilities can be checked and avoided in regular basis if we have a proper screening programs and increase awareness among the common people regarding the importance of hearing screening. As, with respect to hearing loss there are no visual indicators, most of the hearing-impaired children who are not screened at birth and are left unidentified until between 1½ and 3 years of age in which the child already fades away the "critical age" which is required for acquiring the speech and language milestones. However, with the help of newborn hearing screening, a hearing-impaired child can be identified and treated early. In such a case, the child will most likely develop language, speech, and social skills comparable to his or her normal-hearing peers, and thus avoid a lifetime of hearing-loss related

disabilities. There has never been any attempt to screen the neonates or infants for hearing defects in large scale in India. In developing country like India, universal newborn hearing screening is still in a beginning phase. A study done by Kumar and Mohapatra (2011) in India showed that only 38.09% of the medical institutions have a universal Newborn Hearing screening program (NBHS).⁽⁶⁾ They concluded that the necessity for an urgent execution of universal neonatal hearing screening in all the health care facilities in India, at large. According to Garg, Singh and Khurana, National Programme for Prevention and Control of Deafness (NPPCD) of India universal screening can and should be applied.⁽¹⁾ They also stated that programme would entail additional financial burden for the initial purchase of screening machines and rehabilitating the identified children. Government of India should take the initiation to start universal newborn hearing screening program at all district hospitals and medical colleges of India. Awareness about importance of newborn hearing screening is necessary on urgent basis. Private maternity hospitals and health care sector should take the responsibility to screen all newborn infants. Administration of High Risk Register (HRR) should be implemented as it is cost-effective. Recruitment of audiologists and speech-language pathologists should be started in all districts hospitals and medical colleges of India.

Conclusion

Every individual has a right to enjoy a hale and healthy life. Communication disorder like hearing loss has its onset from very early in life. Only through routine hearing screening programs, infants with hearing loss can be persuade a chance to develop their full potential to become fully active, contribute to the society by becoming a integrated member of today's civilized population. All children with hearing loss require a quick, smart identification and intervention by appropriate professionals.

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