UNIVERSAL NEONATAL HEARING SCREENING PROGRAM IN PONDICHERRY – A SOUTH INDIAN EXPERIENCE

2018

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Introduction: Universal neonatal hearing screening (UNHS) is the first step in a neonatal hearing health program. It must be followed by multidisciplinary care for diagnosis and should be started as an early intervention process with the use of personal amplification devices and communication habilitation.¹ The prevalence of mild to profound hearing loss is reported to be between 0.11% -0.6% worldwide.² A community based study detected incidence of congenital hearing loss as 10 per 1000 and 20 per 1000 in rural and urban population of India respectively.³

Objectives: 1. To determine the prevalence of hearing loss among newborn infants

2. To assess the effectiveness and utility of OAE as a screening tool to detect hearing impairment in newborns

3. To study the relationship between selected risk factors and hearing loss

Study design: This study involved 3121 newborns delivered in a tertiary care from January 2015 to January 2018, were subjected to DPOAE within 24 – 72 hours of life; failed candidates underwent repeat DPOAE after 30 days. Infants failing repeat DPOAE underwent DPOAE and BERA at 3 months of life.

Results: All 3121 newborns underwent DPOAE. 689 (22.08%) newborns failed the first screening test. Among the 689, 598 (86.7%) passed the second DPOAE, 84 (12.2%) were referred and 7 did not come for follow up.

Infant cohort	Incidence in the cohort	Incidence expressed per 1000 screened	p-Value by z test
All infants	21 per 3121	6.73	0.001
At risk infants	5 per 468	10.68	0.001
Not at risk infants	16 per 2653	6.03	0.001

Table 1: Incidence of hearing impairment in a cohort of 'at risk' and 'not at risk' infants

Fig. 2: Distribution of risk factors for 'at risk' infants screened for hearing loss

Among 84, 38 (45.23%) passed, 40 (47.62%) failed and 6 did not have follow up. 40 underwent BERA in which 21 neonates had hearing loss. Overall, the prevalence of hearing loss in this study was found to be 0.67%.

Conclusion: Screening for hearing loss in newborns should be done with a screening test that is simple, cheap, quick, sensitive, efficient, and reliable. Implementation of a national universal newborn hearing screening programme is the need of the hour, as early detection of hearing loss will aid early rehabilitation and better outcomes. The highest risk factors identified in the study were respiratory distress, severe birth asphyxia, severe hyperbilirubinemia and postnatal septicemia, all of which have been shown to be associated with neonatal hearing loss in various studies.⁴ This study reflects the implementation and outcome of such a program conducted in Pondicherry, southern part of India. This study has successfully identified the demographics pertaining to the state and now there is ongoing screening for all newborns based on the algorithm developed for the study.

Fig. 1: Algorithm for universal hearing screening used in the study

CRS: Congenital Rubella Syndrome
SBA: Severe Birth Asphyxia
SH: Severe Hyperbilirubinemia
MHB: Maternal Hepatitis B
MCP: Maternal Chicken Pox
MRI: Maternal Retrovirus Infection
MCV: Maternal Cytomegalovirus
RD: Respiratory Distress
PM: Postnatal Meningitis
PS: Postnatal Septicemia
PH: Postnatal Hepatitis
CA: Craniofacial Anomalies
FhoCS: Family history of Childhood SNHL

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