CO RELATIONSHIP BETWEEN BRAINSTEM EVOKED STUDIES AND SEVERE HYPERBILIRUBINEMIA IN HIGH RISK NEONATES

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INTRODUCTION:
Neonatal jaundice is a very common problem encountered in the newborns. It is observed during the first week of life in around 60% of term and 80% of preterm neonates (1).

Bilirubin particularly free bilirubin (BF) can enter the brain cells and cause damage to the neurons with abnormal brainstem evoked response audiometry (BEA) findings subsequently. Early detection and treatment of hearing loss is important for the development of speech and language skills (2).

BEA is an effective and non-invasive means of assessing the functional status of the auditory nerve and brainstem auditory sensory pathway. It is not significantly altered by the state of consciousness, drugs and variety of environmental factors.

The initial sign of hearing loss is very subtle and systematic neonatal hearing screening methods is the most effective means of early detection. Early diagnosis and intervention are decisive factors in development and prognosis of these children (3).

BEA is one of the objective methods of hearing screening. When used and interpreted properly, provide a powerful method of obtaining reliable estimates of auditory sensitivity in infants, young children (4).

AIMS & OBJECTIVE:-
To know the hearing impairment by BEA in High Risk NICU graduates who had severe hyperbilirubinemia during NICU stay.

MATERIAL AND METHODS:
In this study 146 high risk infants having one or more risk factors, according to criteria stated by JCIH 2007(5) were selected from CGH, NICU between corrected age 3 to 6 months, between January 2017-July 2018. BERA is a non –invasive technique to find the integrity of central auditory pathways through the 8th nerve, pons and mid brain. In BERA, electrical potentials are generated in response to several click stimuli and picked from the brain cortex by surface electrodes.(6) The brain stem evoked audiometry is of great value to find out the threshold of hearing in infants, particularly the high-risk groups, the major one being hyperbilirubinemia, and also in the retro cochlear pathology diagnosis. Early identification of hearing impairment improves overall prognosis.(7)

INCLUSION CRITERIA-
Hyperbilirubinemia requiring phototherapy & or exchange transfusion.

EXCLUSION CRITERIA-
1) Babies<1 yr
2) Severe multiple anomalies incompatible with life.
3) Atresia/stenosis of external ear

BEA Recording-
The infants were sedated followed by BEA recording in quiet and semi dark room. RMS EMG EP MARK- II Machine used to record BERA, interpretation of results was done by the physiologist.

DISCUSSION:
Brainstem evoked response audiometry, and otoacoustic emission (OAE) are two commonly used objective tests for childhood deafness. In our study the mean age at which BEA done was 4.5 months, mean birth weight was 2.37 kgs the number of male babies were slightly more compared to female babies. Of 146 high risk infants, 49 had jaundice requiring phototherapy and or DVET, 97 had other risk factors like prematurity, sepsis with or without meningitis 16 had normal hearing, 3 (6%) had mild hearing impairment, 11 (22.4%) had moderate sensory neural hearing loss, 4 (8%) had severe sensorineural hearing loss, 15 (30%) Profound sensory neural hearing loss. A study done by Soni. A (8) has shown that there is a significant relationship between hyperbilirubinemia and BEA changes. 30% of persistent jaundice cases had profound hearing loss. The frequency of BERA abnormalities in hyperbilirubinemia on initial testing in a study done by Agarwal et al was as high as 56.7%(9)

CONCLUSION-
Hearing impairment is common in high risk NICU graduates, All high risk NICU graduates have some form of hearing impairment when compared with age matched controls, Hyperbilirubinemia contributed in majority of cases followed by prematurity, birth asphyxia, bacterial meningitis & sepsis. High risk infant with multiple risk factors found to have profound hearing impairment. Bilateral hearing impairment is more common in high risk infants. Most centers in the developed countries have a program for neonatal and infant hearing screening, such programs have helped to detect the infants with hearing loss in time to ensure normal language development by appropriate intervention; like hearing aids and infant stimulation. Hearing loss should be identified early enough in order to treat and prevent sequelae of speech delay, at least all high risk infants must be screened for hearing impairment prior to discharge from hospital using BERA. Infants with abnormal BERA should be tested within 3 months and several times within the first year, if abnormality persist, infants should be actively managed. Although the rapid reversibility of the observed changes in ABR in jaundiced infants in present study is encouraging, in a study done in Bangalore, A targeted hearing screening approach may
be useful in resource limited settings.(10)

REFERENCES: