International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Neurosonogram Screening in High Risk Neonates

Dr Karthik P[1], Dr R Rama Krishna Paramahamsa[2], Dr Venkat Gopal Kodem[3]

[1]Junior Resident, Department of Paediatrics, GSL Medical College and General Hospital, Rajamahendravaram, Andhra Pradesh, India

[2]Professor, Department of Paediatrics, GSL Medical College and General Hospital, Rajamahendravaram, Andhra Pradesh, India

[3]Junior Resident, Department of Paediatrics, GSL Medical College and General Hospital, Rajamahendravaram, Andhra Pradesh, India

Abstract: ***Introduction: Neurosonogram is the most available and easily repeatable screening for neonatal brain development and in the recognitions of subtle patterns of injury and features suggestive of developmental, metabolic and infectious disorders. Aims and Objectives: Primary Objective: To assess the Importance of Neursonogram as screening for high risk neonates. Secondary Objective: To assess neuroimaging morphology of various cerebral lesions and correlate clinically. Results: 100 high risk neonates who were subjected to neurosonography which resulted in 26% of neonates had abnormal findings, out of which 12% with evidence of intracranial bleed, 8% hyperechogenic thalami, 2% with definite HIE, 4% had cerebral oedema. Conclusion: Neurosonogram is a vital investigatory and screening modality in NICU and effectively documents brain abnormalities and cerebral injury***

Keywords: Neurosonogram, High risk Neonates, HIE, Intracranial Bleed, Neonatal Screening.

1. Introduction

Neurosonogram has become an essential diagnostic tool for depicting normal anatomy and pathological changes in neonatal brain especially in case of a high risk neonate. Scanning through posterior and mastoid fontanelle can help to visualize lesions and structural malformations in cerebellum, brain stem and posterior sub-cortical white matter. [1] Imaging through temporal window provides good view of mesencephalon and brainstem. Neuro-imaging helps in early diagnosis of many etiologies of neonatal encephalopathy and seizures in neonates and monitoring of progression of HIE. Most newborn intensive care units perform neuro-imaging early in the course of hospitalization for premature infants. These evaluations are done to document the presence of intracranial hemorrhage, to guide choice of therapies that may exacerbate risk of further hemorrhage. Appropriate timing of Neurosonogram and accurate assessment of the site and extent of lesions is crucial for accurate prediction of neurodevelopment outcome. [2]

2. Aims and Objectives

Primary Objective
To assess the importance of Neurosonogram as screening for high risk neonates.

Secondary Objective: To assess neuro-imaging morphology of various cerebral lesions and correlate clinically.

3. Materials and Methods

Study Design: Observational co relational clinical study
Study Period: 1 year from June 2018- June 2019.
Sample Size: 100
Inclusion Criteria: High risk neonates with any if the following

- Neonatal seizures
- Birth Asphyxia and HIE
- Respiratory distress
- Neonatal Sepsis
- Pre-term
- Metabolic disturbances with seizures
- Congenital Malformations of CNS and Neural tube defects
- Natal Trauma / Assisted Instrumental delivery

Exclusion Criteria:

- Transient Tachypnea of New born
- Neonates with only non-hemolytic unconjugated hyperbilirubenemia
- Infants >28 days of life.

3.1 Method of Collection of Data

Informed consent obtained, assessment of high risk neonate fitting the inclusion criteria, ante-natal and peri-natal history was procured, clinical examination done, evaluation of baseline investigations which includes sepsis screening, metabolic workup as well as Lumbar puncture in cases of neonatal seizures, chest x ray in all respiratory distress cases. Neurosonogram of High risk neonate fulfilling the inclusion criteria done and correlated clinically.

4. Results

100 high risk neonates who were subjected to neurosonography which resulted in 26% of neonates having abnormal findings, out of which 12% with evidence of intracranial bleed, 8% hyperechogenic thalami, 2% with definite HIE, 4% had cerebral oedema.

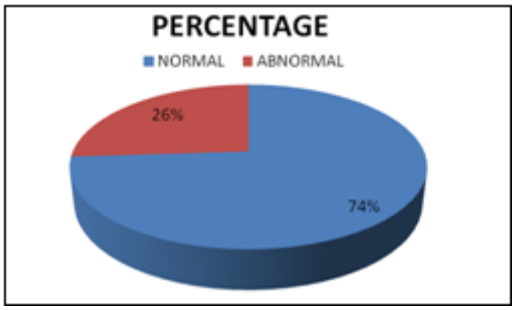

Figure 1: Pie chart showing incidence of Neurosonogram in High risk neonates

Variables	Neurosonogram	
	Normal	Abnormal
Birth Asphyxia	22(29.7%)	10(38.5%)
Birth trauma	2(2.7%)	2(7.7%)
Preterm	33(44.6%)	14(53.8%)
Neonatal Sepsis	39(52.7%)	8(30.8%)
Neonatal Seizures	17(22.9%)	6(23.1%)

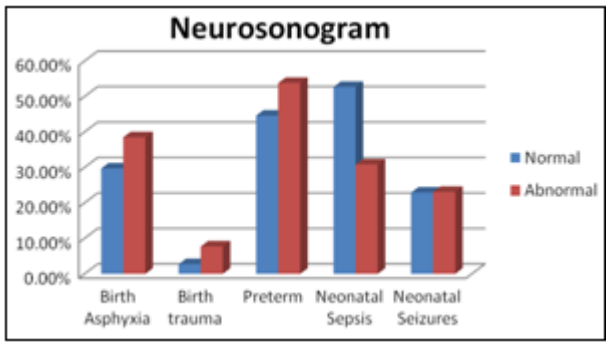

Figure 2: Bar chart showing distribution of High risk neonates as per inclusion criteria and Neurosonogram findings

5. Discussion

Eugenio mercuri, Lilly Dubowitz et al reported an incidence 20% of ultrasound abnormalities in apparently well neonates, and reported ischemic lesions such as periventricular and thalamic densities were most common finding followed by intracranial heamorrhagic lesions on Neurosonogram.[3]

Elia FM et al concluded that Neurosonogram predicts the presence of GMH, intraventricular and parenchymal bleed. [4]

Gupta et al reported that haemorrhages occurred in all neonates within 96 hours of birth. [5] Rutherford MA et al proved that Neurosonogram is a reliable tool for early bedside detection of abnormality suggestive of metabolic disorders, majir structural brain abnormalities. In our present study none of the neonates had Neurosonogram findings suggestive of metabolic disorder. [6]

6. Conclusions

Neurosonogram is a vital investigatory and screening modality in NICU and effectively documents brain abnormalities and cerebral injury. It also emphasizes as screening modality for preterm neonates influencing their neurodevelopment outcome.

References

[1] Gerda van Wezel-Meijler. Cranial Ultrasonography .Advantages and Aims Part 1, Neonatal Cranial Ultrasonography, 1st edn. Berlin:Springer,2007:Pg 3-4.
[2] Lara M Leijser, Frances M Cowan. State of the Art Neonatal Cranial Ultraound 2007; 15:6-17.
[3] Eugenio mercuri, Lilly Dubowitz, Sara Paterson Brown, Frances Crown et al. Incidence of cranial ultrasound abnormalities in apparently well neonates on a postnatal ward and neurological status correlation with antenatal and perinatal factors. Arch Dis Child Fetal Neonatal Ed 1998; 79: F185-F189.
[4] Elia F. Maalouf, Philip J. Duggan, Serena J. Counsell, Mary A. Rutherford, Frances Cowan, Denis Azzopardi and A. David Edwards Pediatrics April 2001, 107 (4) 719-727.
[5] Gupta AK, Anand NK, Lamba IM.Ultrasonic evaluation of neonatalsubependymal-intraventricular hemorrhage and its complications. Indian J Pediatr.1993 Jan-Feb;60(1):11-8.
[6] L.M. Leijser, L.S. de Vries, M.A. Rutherford, A.Y. Manzur, F. Groenendaal, T.J. de Koning, M. van der Heide-Jalving and F.M. CowanAmerican Journal of Neuroradiology August 2007, 28 (7) 1223-1231.