

Diagnostic Value of Doppler Sonographic Findings in Neonatal Hypoxic Ischemic Brain Damage

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Received 2016 December 21; Accepted 2017 February 08.

Abstract

Background: Significant improvements were done in perinatal and neonatal care in last decades. But Hypoxic Ischemic Encephalopathy (HIE) in neonates is still the important cause of neonatal mortality and adverse developmental sequelae. Neonatal HIE is defined when there is evidence of fetal distress, metabolic acidosis of neonate (PH < 7.1 and base deficit more than 12) and presence of encephalopathy. HIE can be diagnosed by presence of some clinical findings (Sarnat- Sarnat staging) and diagnostic imaging. Although Magnetic Resonance Imaging (MRI) is the gold standard and preferred modality for diagnosis of HIE, but it is not possible to do for ill and critical babies who are admitted in Neonatal Intensive Care Unit (NICU). Availability and safety of sonography make it a useful tool for early diagnosis of HIE, that helps physicians to do early and proper treatment.

Methods: In this study we choose 32 neonate according to inclusion criteria of HIE. Doppler sonography of brain arteries was done in first 24 hours after birth. Brain MRI was done as soon as possible when clinical conditions permits doing it.

Results: This study showed there is significant linear correlation between severity of HIE that is defined by sonographic finding compared with severity of HIE showed by MRI finding and clinical date. Cut off point of resistive Index (RI) for all three brain arteries (ACA, MCA and BA) WAS 0.62, The point of optimal sensitivity and specificity for diagnosis of HIE.

Conclusions: Sonography is the excellent screening diagnostic modality for determination of severity and prediction of prognosis in neonatal HIE. Modern sonographic equipment can detect many brain abnormalities. Measuring cerebral Blood Flow Velocities (BFV) and RI of brain arteries with Doppler sonography is useful for prediction of severity of HIE. Use of this modality is helpful for early diagnosis and therapy of neonates with critical condition, that could decrease sequelae of disease. Although MRI can detect more details and must be done when the babies clinical condition is appropriate for transport to MRI unit.

Keywords: Neonatal Hypoxic Ischemic Encephalopathy, Brain Doppler Sonography, Brain MRI

This is an abstract presented in the 33rd Iranian congress of radiology (ICR) and the 15th congress of Iranian radiographic science association (IRSA).