Patterns Of MRI Brain In Neonatal Hypoxic Ischemic Encephalopathy (HIE) - Our Experience

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Purpose of Study: Hypoxic ischemic encephalopathy (HIE) is the most common cause of neonatal deaths and morbidity in children. With the advancement of magnetic resonance imaging (MRI), the ability to localize and describe the severity of the brain injury has expanded tremendously. In this review, we describe the patterns of MRI following hypoxic ischemic brain injury and the outcome of these changes in the neurodevelopment.

Materials and Methods: This was a retrospective study in the Department of Radiology, Tengku Ampuan Afzan Hospital from 1st March 2016 to 31st March 2017. The study included all the paediatric patients (from birth to 12 years old) who were referred for MRI Brain with clinical signs of perinatal hypoxia. Children with developmental delay, cerebral palsy and neurological deficit were also included. Children with brain infection and malignancy were excluded. Patterns of MRI Brain and outcome of the patients were described.

Results: A total of 26 cases were included. Seventy three percent (73%) of the cases had abnormal MRI findings. Eighty percent (80%) of the patients had term delivery. The findings of MRI were T2 hyperintensities, periventricular leukomalacia, brain atrophy, cystic encephalomalacia, thinning of corpus callosum, infarctions and intracranial bleeds. The most common finding was intracranial bleeds (42.3%), followed by T2 hyperintensities (27%) and thinning of corpus callosum (27%). The rest were periventricular leukomalacia (23.1%), cystic encephalomalacia (11.5%), infarction (7.7%) and brain atrophy (3.8%). Normal neurodevelopment and neurological examination were seen in 41.2% of the patients. In 47% of the cases, patients had delayed neurodevelopment while 11.7% of the patients had cerebral palsy.

Conclusion: MRI is the definitive diagnostic modality for perinatal hypoxia. Patterns of MRI brain are determined by the timing and the severity of the insult. Thus it is an important tool for prognostication for HIE.