

Neonatal hypoxic ischaemic encephalopathy with imaging abnormalities in the occipital lobe – how to counsel the parents

Case

A baby boy, with a background of intrauterine growth restriction, was born at 37 weeks and three days gestation via forceps delivery. The baby was born in poor condition, with low heart rate, poor respiratory rate, poor colour and poor tone. At 10 minutes of age, although the heart rate and respiratory effort had improved, the baby remained hypotonic with no active movement or response to handling. The baby was transferred to the Neonatal Intensive Care Unit where therapeutic hypothermia was commenced for hypoxic ischaemic encephalopathy (HIE).

At one hour of age, examination revealed hypertonia with left arm extension, head rotation and hypotension. Cerebral function monitoring (CFM) demonstrated evidence of electrical seizure activity. Magnetic resonance imaging (MRI) showed features in keeping with HIE predominantly affecting the corpus callosum, both optic radiations, and both occipital lobes posteriorly with associated loss of the cortical ribbon. Delayed myelination for age was also found.

Discussion

Visual loss secondary to perinatal HIE is the most common cause of visual disability in both term and pre-term neonates in developed countries [1]. An accurate prediction of future outcome is often impossible, especially during the first few days of life, because the prognosis changes as the condition progresses [2]. Manifestation of any delayed or atypical visual development are also often not apparent until infancy at the earliest [3]. As a result, discussion on visual prognosis with parents of neonates with HIE can be challenging. On the other hand, a few indicators have been reported to be useful in predicting prognosis [2]. These can be used to guide medical teams in their discussion with parents on babies' future outcomes. Predictors include fetal cardiotocography, degree of metabolic acidosis at birth, examination findings, length of apnoea, severity of encephalopathy and cerebral imaging findings.

To facilitate effective communication, medical teams need to be honest and

ensure parents have informed awareness of the diagnosis and the uncertainty of prognosis [3,4]. Statistical data may be helpful but one should be mindful that scientific probabilities vary from case to case. Each patient's condition should be considered individually with a holistic approach.

Healthcare professions need also be cognizant of parents' emotional state throughout the conversation. Parents of babies with HIE are more likely to have stressful and traumatic birthing experiences. The disruption to much awaited bonding with their child might amplify their grief and possible feelings of guilt. These emotions need to be recognised and addressed delicately in the discussions [5].

Any indication of possible damage to the visual pathway, including HIE stage 3, HIE stage 2 with abnormal neurological examination, and stroke associated with HIE, warrants early referral to a paediatric ophthalmologist [2]. Although visual dysfunction may improve with time, close monitoring for any visual impairment is crucial for optimal visual preservation. If any visual defect is not treated within the narrow window of opportunity, unwanted secondary outcomes, such as amblyopia, can be difficult to treat in the future [2,6].

References

1. James M, Connor CMO, Cullinane A, et al. Ophthalmic outcomes following neonatal hypoxic ischaemic encephalopathy; oculomotor, biometric and refractive data in early childhood. *Eye* 2019;33:1152-7.
2. Robertson CM, Perlman M. Follow-up of the term infant after hypoxic-ischemic encephalopathy. *Paediatric Child Health* 2006;11(5):278-82.
3. Çetinçelik M, Rowland CF, Snijders TM. Do the Eyes Have It? A Systematic Review on the Role of Eye Gaze in Infant Language Development. *Front Psychol* 2011;11:589096.
4. Lemmon ME, Donohue PK, Parkinson C, et al. Parent Experience of Neonatal Encephalopathy. *J Child Neurol* 2017;32(3):286-92.
5. Orzalesi M, Aite L. Communication with parents in neonatal intensive care. *Journal of Maternal-Fetal and Neonatal Medicine* 2011;24(S1):135-7.
6. Gogate P, Gilbert C, Zin A. Severe visual impairment and blindness in infants: causes and opportunities for control. *Middle East Afr J Ophthalmol* 2011;18(2):109-14.

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