Abstract

INTRODUCTION: The corpus callosum (CC) links the fibres of the cerebral hemispheres and is a reflection of the cerebral hemisphere volumes. Neonatal hypoxic ischaemic encephalopathy (HIE) results in injuries to the grey and white matter in the brain. MRI is the best imaging technique to assess these injuries, and closely correlates with the clinical findings.

AIM: To objectively assess the corpus callosum spatial parameters via MRI in children with and without reported features of Neonatal HIE as a possible surrogate to white matter volume loss.

METHOD: MRI images of children scanned for clinically suspected HIE were retrospectively reviewed and classified into MRI HIE patterns, by a blinded majority consensus reading of 3 Paediatric radiologists. Corpus callosum measurements in the non-HIE imaging pattern and HIE imaging patterns were compared. Thickness of the rostrum, genu, body and splenium were made, as well as the anteroposterior length and volume of the corpus callosum.

RESULTS: A total of 115 MRI scans were analysed and the corpus callosums were measured, where 41.7% demonstrated no MRI features of HIE and 58.% demonstrated an MRI pattern suggestive of HIE. The rostrum thickness, the genu thickness and CC volume between the categories showed a significant statistical difference (p = 0.00016, p = 0.00011, p = 0.03754 respectively).

CONCLUSIONS: CC thickness, particularly in the anterior regions, has shown promise of being a surrogate measure for white matter volume loss in children imaged for the chronic sequelae of hypoxic ischaemic encephalopathy. Further studies with larger sample sizes would be important in HIE.

KEYWORDS: Hypoxic ischaemic encephalopathyy, corpus callosum, MRI