Assessing structural connectivity in patients with Unilateral Spastic Cerebral Palsy with and without dysphagia

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Objective

• To examine correlations between the structural integrity of the corpus callosum (CC) and dysphagia signs in children with unilateral spastic CP caused by left-hemisphere lesions.

Methods

• 13 children (7 male) with USCP and left hemispheric lesion were included. Ages ranged from 5 to 17 years of age.

• 4 had periventricular leucomalacia (PVL), 8 had middle cerebral artery (MCA) injury and one had cortical and subcortical (thalamus) injury.

• All children underwent a clinical swallowing evaluation using the Dysphagia Disorders Survey (DDS)1 and a DTI scan.

• DTIStudio software was used for the tractography analysis.

• DTI analysis was performed for the entire CC and into three regions: genu, body and splenium.

Results

In Figure 1, we present the total DDS and DDS Part 2 scores (related to swallowing skills specifically) for all children. These scores revealed that 7 children were classified with mild dysphagia and 6 with no dysphagia.

**Total DDS Results**

Figures 3a to 3e present the correlations between DDS total scores and FA (genu), number of fibers of genu, body, splenium and entire CC. These results also show a significant negative correlation between Total DDS scores and these measurements. No other DTI variable was significantly correlated with DDS scores.

**Results**

**Total DDS Results**

Figures 3a to 3e present the correlations between DDS total scores and FA (genu), number of fibers of genu, body, splenium and entire CC. These results also show a significant negative correlation between Total DDS scores and all these measurements. No other DTI variable was significantly correlated with DDS scores.

**Discussion**

• Some children with unilateral spastic CP present with mild to moderate oropharyngeal dysphagia, as also observed by Benfer et al (2003).4

• Our results indicate that callosal motor fibers play a role in the communication between the two hemispheres for swallowing and feeding activities confirming the notion that swallowing is a primarily bilateral activity.

**Conclusion**

• In children with congenital left-hemisphere lesions reduced structural integrity of the corpus callosum is associated with increased signs of dysphagia.

• This study reveals the first evidence that the corpus callosum plays a role in the interhemispheric communication needed to control the function of swallowing with significant implications for treatment.

**References**


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