



Alterations in Cortical Morphology after Neonatal Stroke: Compensation in the Contralesional Hemisphere?

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Mots-clés	cortical thickness [11], FreeSurfe [12], local gyrification index [13], neonatal arterial ischemic stroke [14], surface area [15]
Résumé en anglais	<p>Although neonatal arterial ischemic stroke is now well-studied, its complex consequences on long-term cortical brain development has not yet been solved. In order to understand the brain development after focal early brain lesion, brain morphometry needs to be evaluated using structural parameters. In this work, our aim was to study and analyze the changes in morphometry of ipsi- and contralesional hemispheres in seven-year-old children following neonatal stroke. Therefore, we used surface-based morphometry in order to examine the cortical thickness, surface area, cortical volume, and local gyrification index in two groups of children that suffered from neonatal stroke in the left ($n = 19$) and right hemispheres ($n = 15$) and a group of healthy controls ($n = 30$). Reduced cortical thickness, surface area, and cortical volumes were observed in the ipsilesional hemispheres for both groups in comparison with controls. For the group with left-sided lesions, higher gyrification of the contralesional hemisphere was observed primarily in the occipital region along with higher surface area and cortical volume. As for the group with right-sided lesions, higher gyrification was detected in two separate clusters also in the occipital lobe of the contralesional hemisphere, without a significant change in cortical thickness, surface area, or cortical volume. This is the first time that alterations of structural parameters are detected in the "healthy" hemisphere after unilateral neonatal stroke indicative of a compensatory phenomenon. Moreover, findings presented in this work suggest that lesion lateralization might have an influence on brain development and maturation.</p>

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