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Assessment of the corpus callosum in fetuses with isolated non-severe ventriculomegaly

Monterde E, Hahner N, Pérez-Cruz M, Masoller N, Illa M, Puerto B, Gratacós E, Eixarch E
BCNatal | Fetal Medicine Research Center (Hospital Clínic and Hospital Sant Joan de Déu), Barcelona, Spain

Objective

To evaluate structural changes of the corpus callosum (CC) and its use as an imaging biomarker of altered development of white matter.

Methods

A prospective cohort between 2014 and 2019 was analyzed, including 50 singleton pregnancies with isolated non-severe ventriculomegaly (VM) admitted in the Fetal Medicine Center of Barcelona and 50 controls. Cases of congenital or chromosomal abnormalities, perinatal infection and/or intrauterine growth restriction were excluded. CC was assessed in sagittal plane obtained by transvaginal ultrasound at 30 weeks of gestation. Subsequently, the images were processed with a semiautomatic software (Matlab®) obtaining the following variables: length, total area, areas of Witelson's subdivision.

Results

There were no significant differences in maternal basal characteristics, apart from socioeconomic status and educational level that were significantly lower in VM group (p=0.004 and p=0.042, respectively). As expected, VM was more prevalent in male fetuses (60.4% vs 22.7%, p=0.003). Fetuses with VM have significantly smaller CC, both in length and in whole area. Interestingly, when the Witelson's areas were analyzed all of them, except for the sixth area, were also significantly smaller in fetuses with VM.

Conclusion

Fetuses with isolated non-severe VM showed a significant reduction of the CC, mainly affecting all its regions. These findings support the notion that part of the isolated VM cases has a differential brain development, as previously demonstrated by changes in cortical development. Furthers studies correlating changes in cortical development and CC would be of help in the understanding of fetal brain development in VM.