

## Correlation of prenatal cortical development and neonatal neurodevelopmental outcome in fetuses with isolated non-severe ventriculomegaly

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### Objective

To analyze whether differences in cortical development in fetuses with INSVM are correlated with neonatal neurobehavior.

### Methods

We prospectively included 22 fetuses with INSVM and 26 healthy fetuses (matched by gestational age) controlled in our center from March 2014 to April 2016. Isolated non-severe ventriculomegaly was defined as an atrial width between 10.0 and 14.9 mm measured by ultrasound at diagnosis. Fetuses with associated malformation, infection or abnormal karyotype were excluded. Cortical development was assessed by transabdominal and transvaginal neurosonography at 26 weeks of pregnancy including measurement of Insula, Sylvian fissure (SF), parieto-occipital sulcus (POS), calcarine sulcus (CaS), and cingulate sulcus (CiS) depth normalized by biparietal diameter. Neurobehavioral assessment was performed prospectively during first month of live using the Neonatal Behavioral Assessment Scale (NBAS).

### Results

Mean gestational age at neurosonography was  $26.5 \pm 0.5$  weeks. Mean ventricular width in INSVM group was  $10.67 \pm 1.5$  mm. NBAS, performed at  $44.2 \pm 2.3$  weeks, showed significant differences in INSVM group with worse performance in motor cluster (z-score  $-0.68 \pm 0.4$  vs  $-1.13 \pm 0.71$ ,  $p < 0.01$ ) and higher proportion of abnormal results in organization of state cluster (19.2% vs 45.5%,  $p = 0.05$ ). These worse performance was significantly correlated in fetuses with INSVM: Right-POS with habituation  $R = 0.981$ , right-CiS with regulation of state  $R = 0.696$ , left-CiS with motor  $R = 0.589$ , and left-CiS with regulation of state  $R = 0.634$ .

### Conclusion

Fetuses with INSVM showed differences in neonatal neurobehavioral performance with poorer results in motor and organization of state being this worse performance correlated with cortical development assessed at 26 weeks of pregnancy. These results open the opportunity to explore the use of cortical development as prenatal biomarker of altered neurodevelopment in fetuses with INSVM.