

Patterns of cortical development assessed by neurosonography in PE with or without FGR

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Objective

To explore the pattern of cortical development in pregnancies complicated by preeclampsia (PE) with or without fetal growth restriction (FGR), as compared to uncomplicated pregnancies.

Methods

Prospective observational study including pregnancies complicated by normotensive FGR (birth weight <10th centile) (n=77), PE with normally grown fetuses (n=78), PE with FGR (n=77), and 128 uncomplicated pregnancies matched by gestational age at ultrasound. Detailed neurosonography with transabdominal and transvaginal approach was performed at 33±2 weeks including measurement of Insula, Sylvian fissure and Parieto-occipital, Cingulate and Calcarine sulci. All measurements were adjusted by biparietal diameter. Univariate and multiple regression analysis were conducted.

Results

As previously reported, FGR fetuses showed significant differences in cortical development compared to controls, with reduced Sylvian fissure (0.145 ± 0.02 vs. 0.166 ± 0.02 , $p<0.001$) and parieto-occipital sulcus depth (0.869 ± 0.04 vs. 0.112 ± 0.04 , $p=0.011$) together with larger Insula width (0.332 ± 0.2 vs. 0.318 ± 0.02 , $p<0.001$). Interestingly, a similar pattern of reduced Sylvian fissure (0.142 ± 0.02 vs. 0.166 ± 0.02 , $p<0.001$) and larger Insula depth (0.328 ± 0.02 vs. 0.318 ± 0.02 , $p<0.001$) were observed in the PE group with normally grown fetuses, compared to controls. No significant differences could be demonstrated in cingulate and calcarine sulci depth through groups.

Conclusion

Fetuses of preeclamptic mothers with or without FGR are associated with cortical development changes in intrauterine life, similarly to what has been previously described for FGR alone.