Early-life consequences of hypertensive disorders during pregnancy: an exploration of the retinal microvasculature in young children

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Objective. Assessing the link between prenatal exposure to maternal Hypertensive Disorders during Pregnancy (HDP) and the microvasculature in early childhood.

Materials and Methods. This study is part of the ENVIRONAGE birth cohort study in Flanders, Belgium. Diagnosis of HDP (n = 121) was based on women's medical records obtained after birth and categorized according to the ISSHP criteria into four categories: *i.e.*, essential hypertension (EH = 25), gestational hypertension (GH = 30), early-onset (EPE = 22) or late-onset preeclampsia (LPE = 44). This group was matched to a reference group consisting of children born after pregnancies without HDP (non-HDP; n = 242). In children aged 4 to 6 years, retinal vessel diameters and arteriolar curvature were assessed using a non-mydriatic retinal camera (Canon CR2-plus). Concurrently, skin perfusion was examined through laser Doppler technology during heat-controlled provocation (Periflux6000). Linear mixed effect models adjusted for relevant covariates were applied.

Results. Compared to non-HDP, a negative association was found between the average arteriolar diameter and HDP (β -2.40 μm; 95%CI -5.20 to 0.32). Further analysis within distinct categories revealed a negative association between vascular curvature in children born after early-onset preeclampsia (β -0.015 μm; 95%CI -0.023 to -0.007) compared to children without HDP.

Conclusions. Our results suggest an impaired retinal microvascular structure in young children born after HDP compared to non-HDP. These observations underscore the potential long-term impact of HDP on microvascular health.