

Long-term reduction of endothelial glycocalyx thickness 6 years after preeclampsia

Maya Jalmby¹, Camilla Edvinsson¹, Despoina Lykou¹, Grigorios Karampas¹, Lena Erlandsson¹, Stefan Hansson¹, Federica Piani^{2*}

¹Division of Obstetrics and Gynecology, Department of Clinical Sciences Lund, Lund University, Lund, Sweden.

²Hypertension and Cardiovascular Risk Research Center, Department of Medical and Surgical Sciences, Alma Mater Studiorum University of Bologna, Bologna, Italy.

DOI: 10.36129/jog.2024.S89

Objective. The endothelial glycocalyx (EG) is a complex structure composed of proteoglycans, glycoproteins, and glycolipids that extends from the surface of endothelial cells into the vascular lumen. It plays a critical role in maintaining homeostasis by acting as a barrier, regulating vascular permeability, and influencing various signalling pathways.

In the present study we aimed to evaluate EG thickness in women after a pregnancy complicated by preeclampsia (PE) *vs* those with a healthy pregnancy.

Materials and Methods. Sublingual capillaries were evaluated *in vivo* by side stream dark field microscopy. Eighteen women with previous normotensive pregnancies and 31 with PE on average 6 years after their index pregnancy participated in the study. The width of the EG permeable to red blood cells (PBR) as a measure of EG thickness and the percentage of

vessels filled with red blood cells $\geq 50\%$ of the time indicating actual microvascular perfusion, were calculated.

Results. Women who suffered from PE had a significantly increased global PBR value (3.35 *vs* 3.02 micron, $p = 0.031$), suggesting a reduced EG thickness. No significant differences were observed concerning microvascular perfusion, although a trend towards a decreased perfusion was observed in women with PE.

Conclusions. EG is implicated in the regulation of vascular permeability and inflammation. These factors have been implicated in the pathogenesis of PE. Disruption of the EG could contribute to abnormal placental perfusion with the release of factors that may contribute to the development and progression of PE. EG impairment may persist years after pregnancy, leading to long-term cardiovascular complications.