Association between plasma HLA-DR$^+$ placental vesicles and preeclampsia: a pilot longitudinal cohort study

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Objective. Reduced maternal-foetal immunological tolerance is a possible trigger of poor placentation and preeclampsia (PE). To allow foetal immunological escape from the semi-allogenic mother, there is a complete suppression of Human Leukocyte Antigens (HLA) class II in the human placenta. Aberrant expression of the antigen HLA-DR has been observed in the syncytiotrophoblast of PE patients. Aim of this study was to analyse plasma levels of HLA-DR$^+$ syncytiotrophoblast-derived extracellular vesicles (STEVs) during the three trimesters of pregnancy in relation to the subsequent onset of PE.

Materials and Methods. Pregnant women, recruited during the first trimester screening, underwent venous blood sampling during the three trimesters of pregnancy. STEVs were collected from plasma via ultracentrifugation (120,000 g) and characterized by Western blot, nanotracking analysis and flow cytometry for the expression of placental alkaline phosphatase (PLAP), a marker of placental derivation, and HLA-DR. Clinical and laboratory data were analysed using Student's T test or Mann-Whitney U test, according to types of variables.

Results. Out of 107 women recruited, 10 developed PE. STEVs were detected in all three trimesters of pregnancy with a zenith in the second trimester. Significantly higher plasma levels of HLA-DR$^+$ STEVs were found in the PE group compared to the no-PE group during all three trimesters of pregnancy.

Conclusions. More research is needed to investigate the possible role of HLA-DR+STEVs as circulating early biomarkers of PE.