Effect of pravastatin on placental expression of EGFL7 in preeclampsia: a new potential therapeutic approach

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Objective. Epidermal Growth Factor Like Domain 7 (EGFL7) is an angiogenic factor, highly expressed in physiologic and pathologic angiogenesis. In pregnancies complicated by preeclampsia (PE), a significant EGFL7 downregulation in placental tissues has been already demonstrated.

Pravastatin (PRA) is a lipid-lowering drug recently evaluated for treatment and/or prophylaxis of PE, whereas low dose aspirin (LDA) is the drug of choice. Aim of our pilot case-control study is to evaluate the ability of PRA to modulate EGFL7 expression.

Materials and Methods. 18 women were enrolled: 10 controls, 4 pure and 4 treated early-onset PE (e-PE). In all groups, chorionic villous explants were cultured for 24 hours with or without 10 μM PRA. Gene and protein expression of EGFL7 was quantified by qRT-PCR and Western Blot analysis on RNA and protein extracts, respectively.

Results. PRA significantly increased EGFL7 gene expression in villous explant cultures from healthy and even more in those from pure e-PE pregnancies ($p < 0.001$), while its levels decreased in treated e-PE villi ($p = 0.001$). NOTCH and its target genes were significantly upregulated by PRA in healthy and pure e-PE, while PRA gave an opposite effect in treated e-PE.

Conclusions. PRA can modulate the expression of EGFL7 in human placenta; from a clinical point of view, the effect of PRA encourages the use of this molecule for prevention rather than treatment of PE, when placental damage is established; moreover, the response of EGFL7 to the treatment with PRA seems to be less efficacious when other treatment for PE has been performed.