Expression of nestin in the human placenta of preeclamptic pregnancy

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Objective : Nestin is a type VI intermediate filament protein originally described in neural stem cells. Recent reports have documented nestin expression in the endothelium of proliferating or newly formed blood vessels, and suggested its role as a marker of proliferation and neovascularization capacity of endothelial cell. The aim of the study was to investigate the differential expression of nestin in the normal and preeclamptic human placentas.

Methods : Placental tissues and umbilical cord bloods were obtained from women undergoing cesarean section with normal and preeclamptic pregnancies at term. In endothelial progenitor cell (EPC) obtained from umbilical cord bloods and outgrowing endothelial cell (OEC) obtained after EPC differentiation, nestin gene expression was detected by microarray, and RT-PCR. Western blot analysis for each placental tissue was performed for nestin quantification.

Results : Microarray and RT-PCR revealed that nestin gene was downregulated in EPC, but upregulated in OEC. Western blotting for the normal and preeclamptic placentas revealed that nestin proteins were present in all the placental tissue as verified by immunoreactive protein bands. The bands intensity for nestin was stronger in preeclamptic placenta than in normal placenta. Further studies using immunohistochemical staining will be performed to localize nestin positive cells.

Conclusion : Our studies suggest that nestin could be used as a marker of EPC differentiation. In addition, our data showed that the proliferation and neovascularization capacity of endothelial cell was increased in preeclamptic placenta compared to that from normal pregnancy. Such changes may be a compensatory mechanism for the reduced materno-fetal exchanges and long lasting fetal hypoxia in preeclamptic pregnancy. Furthermore, these changes in endothelial cell of chorioinc villi in preeclamptic pregnancy may give an explanation of fetal response to preeclamptic condition.