

Expression of VEGF and Endostatin in Human Choroidal Neovascular Membranes Following Verteporfin Photodynamic Therapy

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PURPOSE

To evaluate the impact of Verteporfin photodynamic therapy (PDT) on expression of endostatin with regard to vascular endothelial growth factor (VEGF) in human choroidal neovascular membranes (CNV) secondary to age-related macular degeneration (AMD).

METHODS

Retrospective review of an interventional case series of sixty-eight patients who underwent removal of CNV. Twenty-nine patients were treated with PDT 3 to 655 days prior to surgery. CNV were stained for CD34, CD105, Ki-67, cytokeratin18, endostatin, E-selectin and VEGF. Thirty-nine CNV without previous treatment were used as controls. Proliferative activity was determined by "number of proliferating cells in one mm² of a specimen." "Predominance score of VEGF over endostatin" (PS) was defined for retina pigment epithelium (RPE), endothelial cells (EC) and stroma of each membrane separately calculating the difference between VEGF and endostatin staining scores.

RESULTS

Four CNV treated by PDT 3 days previously, disclosed severely damaged EC and low proliferative activity (median=4.855). PS was significantly higher in RPE (PS=2.5, $p=0.0059$) and stroma (PS=2, $p=0.0152$) than in the control group (PS=0). At longer post-PDT intervals, CNV disclosed patent vessels with healthy EC and considerably increased proliferative activity (median= 114.25, $p=0.0227$) although PS was significantly decreased in RPE (PS=0, $p=0.0192$) and stroma (PS=0, $p=0.0152$). PDT did not influence E-selectin expression significantly.

CONCLUSION

VEGF predominance over endostatin early after PDT may underline enhanced angiogenic activity associated with recurrence after PDT. In order to increase effectiveness of PDT, angiogenesis should be inhibited with either endogenous angiogenesis inhibitors like endostatin and/or anti-VEGF agents early after PDT.