

The Effect of Blue Light on Vascular Endothelial Growth Factor

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PURPOSE

Vascular endothelial growth factor (VEGF) plays an important role in AMD. Further it has been suggested that exposure to blue light may also affect the progression of AMD. In this study we analyzed the effect of blue light on the production of VEGF in human retinal pigment epithelial (RPE) cells. The blue light induced apoptosis was correlated with the production of VEGF.

METHODS

Pure cultures of human RPE cells were isolated. RPE cells were irradiated with blue light (430-450 nm) for up to 72 hours. The rate of apoptosis was analyzed with Annexin V staining and flow cytometry. Culture supernatants were collected at 12, 24, 48, and 72 hours and the production of VEGF was measured with Elisa. Cultures without light exposure (in dark) served as controls.

RESULTS

Human RPE cells produced a significant amount of VEGF in the dark. Blue light exposure decreased the production of VEGF by RPE cells at all time points (when compared to no light exposure). The blue light induced decrease of VEGF production was significant at 48 and 72 hours ($P < 0.05$). There was no significant increase in blue light induced apoptosis for up to 48 hours. Although there was an increase in blue light induced apoptosis at 72 hours (when compared to no light exposure), this increase was statistically not significant.

CONCLUSION

Short term exposure to blue light suppresses the production of VEGF in human RPE cells. This may be related to the pro-apoptotic effect of blue light. Currently, we are assessing the mechanisms involved in blue light induced decrease of VEGF production.