

Morphological and Molecular analysis of retina under bright light exposure

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Background and Aim : Membrane of photoreceptors is rich in unsaturated fatty acids. Fatty acid binding proteins (FABPs) are cytosolic non-enzymatic proteins that have important role in transportation of fatty acids within the cytoplasm; therefore, expected to localize some FABPs in the normal photoreceptors as well as degenerating retina after photic injury. In this study we attempted in this regard; and reported that, A-FABP localized in subpopulation of apoptotic photoreceptor cells and E-FABP were localized in the invading macrophages from the surrounding to degenerating retina.

Methods: 10 weeks male Bulb/C mice were used in this study. The animals were located under 3500 Lux intense white light for 7 hours. The retinas after 6, 12, 18, 24, 36, 48, 72 hours and 1 week after light injury, were morphologically analysed by light and electron microscopy. Molecular localization was done via Immunohistochemical analysis .

Results: In the morphological analysis, the thickness of retina gradually decreased after light damage and most of photoreceptors disappeared from retina 1 week after light injury. Photoreceptors go towards degeneration after light injury under apoptotic process. the apoptotic photoreceptor reach a peak in 24 hours after light injury that was detected by TUNEL technique. A-FABP was localized in subpopulation of TUNEL positive cells; therefore A-FABP was expressed in apoptotic photoreceptors. In co-localization of F4/80 a macrophage marker or E-FABP, as a result almost all E-FABP-immunopositive cells were colocalized by F4/80, therefore E-FABP immunopositive cells are corresponding to macrophages.

Discussion and Conclusions: Intense light induced apoptosis in photoreceptors and A-FABP localized in of apoptotic photoreceptors. It probably is involved in photoreceptor apoptotic processes. E-FABP was expressed in invading macrophages of degenerating retina and probably involved in lipid metabolism procedure. The exact role of these FABP in retina is under research.