AGE-RELATED MACULAR DEGENERATION: VEGETABLE OILS EFFECT

T. Said, O. Helal, H. Berrougui, J. Tremblay-Mercier,
S. Cunnane, A. Khalil
Research Centre on Aging, Sherbrooke QC, Sherbrooke, Canada

Introduction: Age-related macular degeneration (AMD) has become the most common cause of legal blindness in industrialized countries. It is a degenerative condition affecting the macula or central area of the retina in elderly people. Oxidative stress is the major factor in the pathogenesis of AMD. Few antioxidants have been proposed in the prevention of diseases. So, some components of vegetable oils are important in the structure and function of the retina. The purpose of this work was to explore biological properties of four vegetable oils in the prevention of AMD. Methods: Four different vegetables oils were incubated with the pigment epithelial cells of the retina. The cytotoxicity of these vegetable oils was assessed by spectrofluorimetry using neutral red, yopro-1and H2CFDA. Membrane fluidity was evaluated by the fluorescence anisotropy with DPH. Inflammation was evaluated by the measurement of ICAM protein expression by flow cytometry and membrane fatty acid composition was assessed by gas chromatography. Results: None of the tested oils is necrotic, apoptotic, or pro-inflammatory. In vitro, oil rich in zeaxanthin and lutein present no beneficial effect on the biophysical properties of the membranes. However, omega-3 rich oil improves the membrane fluidity by 48% compared to control. Moreover incubation of retina cells with omega-3 rich oil increases linolenic acid membrane composition by 230% after 72 hours incubation. Conclusion: Our results show that vegetable oil components can incorporate in retina cells without inducing cytotoxicity. These results support clinical studies showing beneficial effects of omega-3 in retina function.