Lipids and eye diseases: an epidemiological perspective

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Retinal diseases, in particular age-related macular degeneration (AMD), are major causes of vision loss in industrialized countries. In the last fifteen years, epidemiological studies have highlighted the potential protective role of omega 3 polyunsaturated fatty acids (PUFA) in AMD. In 2000, a 50 % lower risk for AMD in regular fish consumers was reported for the first time, in a cross-sectional analysis of the Blue Mountains Eye Study. Since then, 8 cross-sectional and case-control studies have produced similar results, although not always reaching statistical significance. However, cross-sectional and case-control studies are subject to reverse causality: subjects with AMD may have decreased their fish consumption because of the disease itself, for instance because of difficulties in shopping and cooking. Six prospective studies,in which dietary habits are assessed before the onset of AMD, have also all shown a reduced risk for AMD in high consumers of fish or omega 3 LC-PUFA, although not always reaching statistical significance. Finally, use of biomarkers may help overcome many methodological difficulties of dietary assessment (recall bias, imprecisions in assessment of food intake and nutritional content of foods…). In the French Alienor Study, we have recently shown that subjects with high plasma omega3 LC-PUFA had a lower risk of AMD within the next 10 years. Overall, epidemiological data are strikingly consistent, showing a major reduction of risk for AMD in subjects with high omega3 LC-PUFA status.
Finally, HDL-cholesterol pathway may also be involved in retinal aging, as evidenced by genetic and epidemiological studies. The pathophysiological pathways involved in these relationships will need to be clarified.