Plasma Lutein and Zeaxanthin and Other Carotenoids as Modifiable Risk Factors for Age-Related Maculopathy and Cataract: The POLA Study

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PURPOSE. To assess the associations of plasma lutein and zeaxanthin and other carotenoids with the risk of age-related maculopathy (ARM) and cataract in the population-based Pathologies Oculaires Lie´es a` l'Age (POLA) Study.
METHODS. Retinal photographs were graded according to the international classification. ARM was defined by the presence of late ARM (neovascular ARM, geographic atrophy) and/or soft indistinct drusen (125 microns) and/or soft distinct drusen (125microns) associated with pigmentary abnormalities. Cataract classification was based on a direct standardized lens examination at the slit lamp, according to Lens Opacities Classification System III. Plasma carotenoids were measured by high-performance liquid chromatography (HPLC), in 899 subjects of the cohort.
RESULTS. After multivariate adjustment, the highest quintile of plasma zeaxanthin was significantly associated with reduced risk of ARM (OR _ 0.07; 95% CI: 0.01– 0.58; *P* for trend _ 0.005), nuclear cataract (OR _ 0.23; 95% CI: 0.08–0.68; *P* for trend _ 0.003) and any cataract (OR _ 0.53; 95% CI: 0.31–0.89; *P* for trend _ 0.01). ARM was significantly associated with combined plasma lutein and zeaxanthin (OR _ 0.21; 95% CI: 0.05– 0.79; *P* for trend _ 0.01), and tended to be associated with plasma lutein (OR _ 0.31; 95% CI: 0.09 –1.07; *P* for trend _ 0.04), whereas cataract showed no such associations. Among other carotenoids, only _-carotene showed a significant negative association with nuclear cataract, but not ARM.
CONCLUSIONS. These results are strongly suggestive of a protective role of the xanthophylls, in particular zeaxanthin, for the protection against ARM and cataract. (*Invest Ophthalmol Vis Sci.* 2006;47:2329–2335) DOI:10.1167/iovs.05-1235