

Plasma Carotenoid levels and Cognitive Performance in an Elderly Population: Results of the EVA study

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The EVA Study is a 9 year longitudinal study with 6 waves of follow up that looked primarily at the aging of the arteries. The analysis presented here was restricted to 589 participants in the last follow up of the EVA study conducted between June 2000 and December 2001. The study included volunteers with higher education, higher incomes and grater cognitive function than the average elderly French population.

Trained neuropsychologists evaluated cognition using a battery of tests that included the Mini Mental State Examination. Visual conceptual and visiomotor tracking were assessed with Trail Making Test Part A (which measures motor speed, control and working memory) and Trail Making Test Part B (which assess executive functioning, like set shifting). The maximum time allotted for completion of TMTA was 180 seconds; for TMTB 240 seconds.

Digit Symbol Substitution from the Wechsler Adult Intelligence Scale-Revised was used to measure sustained attention and logical reasoning. Manual dexterity and psychomotor speed were evaluated with Finger Taping Test, verbal fluency with the Word Fluency Test and finally Depression symptoms were assessed by the Center for Epidemiological Studies-Depression scale.

Significant Associations were observed between low levels of **Zeaxanthin** and low performance in ALL cognitive tests except MMSE.

	TMTA	TMTB	DSS	FTT	WFT
OR	1.66	1.6	1.87	1.7	1.87
CI	1.08-2.55	1.04-2.44	1.21-2.89	1.10-2.62	1.16-3.00

After taking into account socio-demographic factors (sex, age, education), consumption habits (tobacco, alcohol), diabetes, hypertension and body mass index, associations between Zeaxanthin and cognitive performance remained significant for all the parameters in the table except TMTB.

Of all the carotenoids tested, only lycopene showed significant associations with TMTB and DSS after adjustment by the above mentioned factors. Total plasma carotenoids, α -carotene, β carotene, lutein and β -cryptoxanthin showed no statistically significant association with low cognitive performance.

The same analyses were performed by removing first participants with depressive symptomatology, then participants that were underweight and finally adjusting for levels of plasma retinol. In the three situations the researchers obtained the same results. They also made sure that their findings were not driven by the chosen dichotomous classifications for cognition and carotenoid levels.

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