

COMPARATIVE STUDY OF SERUM CAROTENOID LEVELS IN CAUCASIAN AND JAPANESE WOMEN

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Due to recent interest in the possible role of carotenoids, especially betacarotene, in reducing risk of certain types of cancer, impetus for the development of methods for the separation and quantification of these compounds from biological samples has been provided (Bieri et al. 1985; Milne and Botnen 1986; Thurnham et al. 1988). There are as many as 20 regularly occurring carotenoids in normal serum, but there are only three main pro-vitamin A carotenoids: alpha-carotene, beta-carotene and cryptoxanthin. Lycopene, a straight-chain isomer of beta-carotene, and xanthophyll or lutein, one of the most widespread carotenoids containing oxygen, are also present in substantial amounts (Milne and Botnen 1986; Rock et al. 1992).

This study was conducted to measure and compare serum carotenoid levels in Caucasian and Japanese women. Serum carotenoid levels in 40 apparently healthy women (20 Caucasian and 20 Japanese), aged 40 to 60, were determined by the modified HPLC method of Thurnham et al. (1988). This method permits separation and quantification of five carotenoids for which standards are currently available. The table shows carotenoid levels in the subjects' sera.

Subjects	N	Age	BMI	Serum carotenoid concentrations, µg/100mL (Mean± S.E.)				
				Lutein/ zeaxanthin#	Cryptoxanthin	Lycopene	Alpha- carotene	Beta- carotene
Caucasian	20	47.2±1.4	24.9±0.9	16.6±1.4	8.3±1.4	6.6±0.8	2.2±0.3	21.5±2.6
Japanese	20	50.2±1.2	22.5±0.6	49.9±4.8	18.3±2.1	5.0±0.6	2.6±0.3	45.9±3.4
P-value		NS	P < 0.05	P < 0.001	P < 0.001	NS	NS	P < 0.001

To convert to µmol/L, divide lutein/zeaxanthin by 56.885, cryptoxanthin by 55.285, and other carotenoids by 53.685.

Values are lutein equivalents due to the coelution of lutein and zeaxanthin.

NS = Not statistically significant at the two-sided 0.05 level.

We conclude that Japanese women have higher serum levels of lutein/zeaxanthin, cryptoxanthin and beta-carotene than Caucasian women. However, there are no significant differences in lycopene and alpha-carotene levels. These findings might be attributable to dietary intake, smoking, alcohol consumption and body mass index (Nierenberg et al. 1989; Rock et al. 1992). However, dietary factors are likely to be the most important on account of major differences between these two ethnic groups.

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