

Total antioxidant capacity: A useful tool in assessing dietary and plasma antioxidant status and cardiovascular disease risk

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I ncreased plasma total antioxidant capacity (TAC) has been associated with a high consumption of fruits and vegetables. However, limited information is available on whether plasma TAC reflects the dietary intake of antioxidants and the levels of individual antioxidants in plasma. By using three different assays, the study aimed to determine if plasma TAC can effectively predict dietary intake of antioxidants and plasma antioxidant status. Forty overweight and apparently healthy postmenopausal women were recruited. Seven-day food records and 12-h fasting blood samples were collected for dietary and plasma antioxidant assessments. Plasma TAC was determined by VCEAC, FRAP and ORAC assays. TAC values determined by VCEAC were highly correlated with that by FRAP ($r = 0.79$, $p < 0.01$) and moderately correlated with that by ORAC ($r = 0.34$, $p < 0.05$). Pearson correlation analyses showed that plasma TAC values by VCEAC and ORAC had positive correlation with plasma uric acid ($r = 0.56$ for VCEAC; $r = 0.49$ for ORAC) and total phenolics ($r = 0.63$ for VCEAC; $r = 0.36$ for ORAC). However, TAC measured by FRAP was correlated only with uric acid ($r = 0.69$). After multivariate adjustment, plasma TAC determined by VCEAC was positively associated with dietary intakes of γ -tocopherol ($p < 0.001$), β -carotene ($p < 0.05$), anthocyanidins ($p < 0.05$), flavones ($p < 0.05$), proanthocyanidins ($p < 0.01$), and TAC ($p < 0.05$), as well as with plasma total phenolics ($p < 0.05$), α -tocopherol ($p < 0.001$), β -cryptoxanthin ($p < 0.05$) and uric acid ($p < 0.05$). The findings indicate that plasma TAC measured by VCEAC reflects both dietary and plasma antioxidants and represents more closely the plasma antioxidant levels than ORAC and FRAP.

Biography

Ock K. Chun received her Ph.D from Seoul National University and completed postdoctoral studies from Cornell University and Michigan State University. She is an assistant professor in the Department of Nutritional Sciences of the University of Connecticut. She has published more than 60 papers in reputed journals and serving as an editorial board member of peer-reviewed journals.

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