Relative Validity of Dietary Total Antioxidant Capacity for Predicting All-Cause Mortality in Comparison to Diet Quality Indexes in US Adults

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Objectives: Dietary total antioxidant capacity (TAC) is a useful tool for assessing total antioxidant power in the diet, and high dietary TAC has been reported to be associated with lower oxidative stress and risk of chronic diseases. While traditionally diet quality index scores (DQIS) have been used to predict health outcomes, dietary TAC may also be a novel and valid predictor. Therefore, this study aimed to evaluate the associations between both dietary TAC and DQIS and all-cause mortality.

Methods: Based on the National Health and Nutrition Examination Survey (NHANES) III (1998–1994) and 1999–2006, a total of 23,797 adults aged 30 years or older who were followed-up until 2015 were included. Dietary TAC and DQIS including the Healthy Eating Index-2015 (HEI-2015), Alternative Health Eating Index-2010 (AHEI-2010), alternate Mediterranean Diet (aMED), and Dietary Approaches to Stop Hypertension (DASH) were calculated using a 1-day 24-h dietary recall. Hazard ratios (HRs) and 95% confidence intervals (CIs) for all-cause mortality by quintiles of dietary TAC and DQIS were estimated using Cox proportional hazards models.

Results: Dietary TAC and DQIS similarly differed by sociodemographic characteristics including age, gender, race/ethnicity, education, and income and lifestyle behaviors such as physical activity and smoking among US adults (P < 0.0001 for all). After adjusting for confounders, US adults in the highest quintiles of DQIS had lower rates of all-cause mortality compared to those in the lowest quintiles (HEI-2015 HR: 0.86, 95% CI: 0.76–0.97; AHEI-2010 HR: 0.83, 95% CI: 0.73–0.93; aMED HR: 0.78, 95% CI: 0.68–0.89; DASH HR: 0.78, 95% CI: 0.69–0.89). Similarly, those in the highest quintile of dietary TAC also had a lower rate of all-cause mortality than those in the lowest quintile (HR: 0.89, 95% CI: 0.79–0.99).

Conclusions: These findings indicate that both DQIS and dietary TAC were inversely associated with all-cause mortality and that dietary TAC predicts overall mortality in US adults. Further studies should expand this investigation to assess disease-specific mortality among subpopulations defined by gender, race/ethnicity, and socioeconomic status.

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