Associations of Circulating Levels of Trimethylamine N-oxide, Choline, Carnitine, and Betaine with Inflammatory Markers Among Breast Cancer Survivors

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Objectives: We examined the associations of circulating levels of trimethylamine N-oxide (TMAO) and its precursors (choline, carnitine, and betaine) with inflammatory markers in breast cancer survivors in Korea.

Methods: A total of 431 women (285 premenopausal breast cancer) aged 30–78 years were included. Least-squares mean (LS-mean)s and 95% confidence interval (CI)s were estimated for plasma levels of high-sensitivity C-reactive protein (hs-CRP), interleukin (IL)-6, IL-8, tumor necrosis factor-α (TNF-α), and adiponectin according to plasma levels of TMAO, choline, carnitine, and betaine, using the generalized linear models.

Results: Among premenopausal breast cancer survivors, increasing circulating levels of choline were associated with increasing levels of IL-6, IL-8, and TNF-α; LS-means (95% CIs) of the lowest and the highest quartiles were 0.75 (0.56–0.96) and 1.01 (0.80–1.24) pg/mL (p for trend = 0.019) for IL-6, 11.49 (8.19–15.97) and 17.73 (12.96–24.13) pg/mL (p for trend = 0.005) for IL-8, and 9.45 (7.47–11.88) and 11.99 (9.63–14.88) pg/mL (p for trend = 0.021) for TNF-α, respectively. Increasing plasma betaine levels were associated with increasing levels of adiponectin but decreasing levels of hs-CRP and IL-6; LS-means (95% CIs) of the lowest and the highest quartiles were 7.25 (5.65–9.23) and 9.05 (7.10–11.47) μg/mL (p for trend = 0.044) for adiponectin, 0.68 (0.45–0.96) and 0.35 (0.16–0.57) mg/L (p for trend 0.017) for hs-CRP, and 0.98 (0.77–1.21) and 0.75 (0.57–0.97) pg/mL (p for trend = 0.013) for IL-6, respectively. However, plasma levels of TMAO and its precursors were not significantly associated with inflammatory markers in postmenopausal breast cancer survivors.

Conclusions: In this cross-sectional study of breast cancer survivors, increasing plasma levels of choline were associated with increasing levels of inflammatory markers, but plasma levels of betaine were inversely associated with these markers among premenopausal breast cancer survivors.

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