Background

Although fatty acid intake has been associated with risk of coronary disease events, the association between blood omega-6 and trans fatty acids (FAs) at the time of an acute coronary syndrome (ACS) is unknown.

Methods

The relationship of blood FA composition to ACS was analyzed in 768 incident cases and 768 controls (matched on age, sex, and race).

Results

Compared to controls, ACS cases' blood cell membrane content of linoleic acid was 13% lower ($P < .0001$); arachidonic acid was 3.6% higher ($P < .001$); the trans isomer of oleic acid was 13.3% higher ($P < .0001$); and the trans-trans isomer of linoleic acid was 13.3% higher ($P = .003$). In multivariable analyses, a 1-SD decrease in linoleic acid was associated with $>3$ times the odds for being a case (odds ratio [OR] 3.23, 95% confidence interval [CI] 2.63-4.17). The relationship of arachidonic acid to ACS was U shaped; compared to the first quartile of arachidonic acid, the ORs for case status in the second, third, and fourth quartiles were 0.73 (95% CI 0.47-1.13), 0.65 (95% CI 0.41-1.04), and 2.32 (95% CI 1.39-3.90), respectively. The OR for a 1-SD increase in trans oleic acid was 1.24 (95% CI 1.06-1.45), and for trans-trans linoleic acid, 1.1 (95% CI 0.93-1.30). All associations were independent of membrane omega-3 FA content.

Conclusions

High blood levels of linoleic acid but low levels of trans oleic acid are inversely associated with ACS. The relationship of arachidonic acid to ACS appears more complex.

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