Dietary gamma-linolenic acid lowers blood pressure and alters aortic reactivity and cholesterol metabolism in hypertension.

Engler MM, Engler MB, Erickson SK, Paul SM.
Department of Physiological Nursing, University of California, San Francisco 94134-0610.

Abstract

OBJECTIVE: To determine the effects of dietary gamma-linolenic acid upon blood pressure, aortic reactivity and cholesterol metabolism in spontaneously hypertensive (SHR) and normotensive Wistar-Kyoto (WKY) rats.

DESIGN: Randomized parallel-group study.

METHODS: SHR and WKY rats were fed a purified diet containing either sesame or borage oil rich in gamma-linolenic acid for 7 weeks. Blood pressure measured by the tail-cuff method and weight were monitored weekly. At the end of the study, intra-arterial pressor responses to norepinephrine and angiotensin II, and reactivity of isolated aortic rings to norepinephrine, angiotensin II, KCl and acetylcholine were determined. Serum cholesterol and triglycerides were measured. Hepatic and intestinal enzymes and receptors of cholesterol metabolism were also measured.

RESULTS: Dietary borage oil significantly decreased blood pressure in SHR and WKY rats compared with sesame oil-fed rats. Pressor responses to norepinephrine and angiotensin II, and aortic reactivity to norepinephrine, angiotensin II, KCl and acetylcholine were not significantly different. The borage oil diet increased serum cholesterol levels in WKY rats and hepatic B-hydroxy-3-methylglutaryl coenzyme A reductase in SHR.

CONCLUSION: These data indicate that dietary borage oil has a blood pressure lowering effect in hypertensive and normotensive rats. However, the effect cannot be explained by altered sensitivity to humoral and neural vasoconstrictors or changes in cholesterol metabolism. Other mechanisms should be investigated.

PMID: 1335001 [PubMed - indexed for MEDLINE]