

Abstract

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Low omega-6/omega-3 polyunsaturated fatty acid ratios reduce hepatic C-reactive protein expression in apolipoprotein E-null mice.

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OBJECTIVE: Expression characteristics of C-reactive protein (CRP) for the omega-6/omega-3 polyunsaturated fatty acid (PUFA) ratios have not been evaluated in the well-qualified experimental atherosclerotic mouse model. This work focused on characteristics of CRP expression in the liver of apolipoprotein E-null (apoE(-/-)) mice influenced by omega-6/omega-3 PUFA ratios.

METHODS: Varying ratios of omega-6/omega-3 PUFAs (group 1, 1.28; group 2, 5.03; group 3, 9.98; and group 4, 68.26, respectively) on hepatic and aortic CRP expressions were assessed in male apoE(-/-) mice fed a diet containing 5% (w/w) experimental fat for 6 wk. Hepatic peroxisome proliferator-activated receptor-gamma mRNA abundance, hepatic interleukin (IL)-6 protein level, atherosclerotic lesions, and serum cytokines including IL-1beta, IL-6, and tumor necrosis factor-alpha were examined.

RESULTS: As the dietary ratio of omega-6/omega-3 fatty acids ascended, so did the expression of hepatic and aortic CRP and hepatic IL-6 protein. However, peroxisome proliferator-activated receptor-gamma mRNA level had a tendency to decrease. Serum IL-1beta, IL-6, and tumor necrosis factor-alpha levels did not show a statistical difference among the mice fed the four ratios of the omega-6/omega-3 PUFA diet. The group 4 mice developed a significant increase in atherosclerotic lesions compared with the other groups.

CONCLUSION: The results indicated that low ratios of omega-6/omega-3 PUFAs (1.28-9.98) downregulated the hepatic and aortic CRP expressions and reduced aortic en face lesions in apoE(-/-) mice compared with the high ratio of the omega-6/omega-3 PUFA diet.

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