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Effects of vitamin K2 (menatetrenone) on atherosclerosis and blood coagulation in hypercholesterolemic rabbits.

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Abstract

Gamma-Carboxyglutamic acid (Gla)-containing protein, synthesized in the presence of vitamin K, has been found in atherogenic plaques, but the pharmacological effect of vitamin K on atherosclerosis is unclear. We examined whether vitamin K2 (menatetrenone) could affect the progression of both atherosclerosis and hypercoagulability in hypercholesterolemic rabbits. Vitamin K2 in daily doses of 1, 10 and 100 mg/kg was given with a 0.5% cholesterol diet for 10 weeks to 8 rabbits each. The plasma levels of total-cholesterol in the vitamin K2-treated groups were clearly lower than that of the hypercholesterolemic control group. The excessive dose of vitamin K2, even at the high dose of 100 mg/kg/day for 10 weeks, did not accelerate the progression of atherosclerosis and did not promote the coagulative tendency in the rabbits. In contrast, the vitamin K2 treatment (1 to 10 mg/kg/day) suppressed the progression of atherosclerotic plaques, intima-thickening and pulmonary atherosclerosis, the increase of ester-cholesterol deposition in the aorta, and both the elevation in plasma factor X level and increase in Hepaplastin test value in the rabbits. These results indicate that the pharmacological dose of vitamin K2 prevents both the progression of atherosclerosis and the coagulative tendency by reducing the total-cholesterol, lipid peroxidation and factor X activity in plasma, and the ester-cholesterol deposition in the aorta in hypercholesterolemic rabbits.

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