

Thesis title Effect of vitamin E supplementation
 on cholesterol metabolism in rabbit
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ABSTRACT

Attempts have been made in this study to confirm the hypocholesterolemic effect of vitamin E in rabbits induced to have hypercholesterolemia by feeding with a high-cholesterol diet and to find out the mechanism by which vitamin E exerts this effect in cholesterol-feeding rabbits. The experiments were carried out by feeding rabbits with a basal diet added with 0.25 and 0.5 % cholesterol, and supplemented with corn oil or with vitamin E of 2100 mg/week for 8 weeks. Rabbits fed the high cholesterol diet with only corn oil supplement showed increased plasma cholesterol of up to 1,000 mg % at the end of feeding period, whereas vitamin E supplementation reduced plasma cholesterol after 4 weeks of feeding by approximately 50 % at the end of feeding period. The hypocholesterolemic effect of vitamin E was observed in cholesterol associated with VLDL+LDL but not HDL fractions.

In liver microsomes, the activity of cholesterol 7 α -hydroxylase increased 4-5 folds in

rabbits fed the high-cholesterol diet with vitamin E supplement compared to those with corn oil supplement. The increased activity of 7α -hydroxylase in vitamin E-supplemented rabbits was consistent to the increase in bile acid concentration in bile of these rabbits as compared to that of the corresponding corn oil supplemented rabbits. Vitamin E supplementation showed no effect on the free cholesterol nor the cholesteryl ester content in liver, but significantly decreased cholesterol content in liver microsomes of vitamin E supplemented as compared with that of corn oil-supplemented rabbits. The cholesterol and phospholipid ratios in liver and bile of vitamin E-supplemented and corn oil supplemented rabbits were not significantly different whereas this ratio in liver microsome of vitamin E supplemented was slightly lower than that of corn oil supplemented rabbits. Moreover, vitamin E reduced lithogenicity of bile from rabbits fed the high-cholesterol diets, although gallstone was not found in any rabbits.

The results observed in this study confirmed suggest that the hypocholesterolemic effect of vitamin E in cholesterol-feeding rabbits may partially involve the increase in conversion of cholesterol to bile acids as the consequence of increased cholesterol 7α -hydroxylase activity. The latter effect of vitamin E may be clinically useful for gallstone prevention.