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Vitamin E and the Susceptibility of Erythrocytes and Reconstituted Liposomes to Oxidative Stress in Aged Diabetics*

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A remarkable increase in the permeability of erythrocyte ghosts and liposomal membranes composed of erythrocyte lipids from aged diabetics was revealed by measuring [^{14}C] glucose leakage. There were no significant differences in the contents of free cholesterol or phospholipids, or in the cholesterol/phospholipid ratio between diabetic and normal erythrocyte membranes, but significantly higher amounts of unsaturated fatty acids, arachidonic acid and docosahexaenoic acid were observed in the erythrocyte membranes of diabetics. Reconstituted liposomes prepared from aged diabetic erythrocyte lipids were highly susceptible to superoxide-induced oxidative stress. Vitamin E was highly effective in suppressing the peroxidative lysis of liposomes composed of diabetic erythrocyte lipids. The effect of superoxide dismutase (SOD) on the inhibition of peroxidation of unsaturated lipids within liposomal membranes was less than that of vitamin E.

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