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Effects of Vitamin E on the Phospholipase A₂ Activity and Changes of Phospholipid species of liver in Streptozotocin-Induced Diabetic Rats

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The purpose of this study was to investigate effects of vitamin E on phospholipase A₂ activity and changes of phospholipid species in streptozotocin induced diabetic rats. Sprague-Dawley male rats weighing 100 ± 10g were fed a vitamin E-free diet (the DM-0E group), a 40 mg vitamin E/Kg diet (the DM-40E group), or a 400 mg vitamin E/Kg diet (the DM-400E group) according to levels of vitamin E supplementation. Diabetes was induced by intravenous injection of 55 mg/Kg of STZ in sodium citrate buffer (pH 4.3) after four weeks feeding of three experimental diets. The percentage PC hydrolysis in the liver microsomes was not significantly different between any of the four groups. The percentage of PE hydrolysis in the liver microsomes of the DM-0E, DM-40E, and DM-400E groups increased by 84.4%, 69.3%, and 47.7% respectively, compared to that of the normal group. The hepatic PLA₂ activity increased in DM-0E group which was not fed vitamin E, the DM-40E group, and the DM-400E group which were fed vitamin E by 109.9%, 79.8%, and 35.1%, respectively, compared with the normal group. The hepatic thiobarbituric acid reactive substance (TBARS) contents, an index of lipid peroxidation, increased by 460% and 241% in the DM-0E and DM-40E groups, respectively, compared to the normal group. However, the content in the DM-400E group was not significantly different from that in the normal group. In conclusion, dietary vitamin E reduced the increased concentration of lipid peroxides in the liver tissues of diabetic rats through decreasing their increased PLA₂ activity and PE hydrolysis.