

**DIRECT EVIDENCE FOR THE IMPAIRED LYMPHATIC ABSORPTION OF  $\alpha$ -TOCOPHEROL ( $\alpha$ TP) IN MARGINALLY ZINC DEFICIENT (ZD) RATS.**

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Previously (J. Nutr. Biochem. 6:604-612, 1995), we have shown that the lymphatic absorption of fatty acid and vitamin A is drastically reduced in marginally zinc deficient adult male rats. The present study investigated whether the intestinal absorption of  $\alpha$ TP also is influenced by zinc deficiency. To equalize food intake and feeding behavior, both ZD and pair-fed(PF) rats were trained for meal feeding. ZD rats fed a diet containing 3  $\mu$ g Zn/g and PF rats fed the same diet but containing 30  $\mu$ g Zn/g for 5 wk. Under the conditions, the body weight ( $339 \pm 2$ g) of ZD rats reached 98% of that ( $345 \pm 5$ g) of PF rats and the serum zinc concentrations were 10.9  $\mu$ M in ZD and 22.0  $\mu$ M in PF rats at 5 wk. Rats with lymph cannula were infused via duodenal catheter with 3 ml/h of a lipid emulsion consisting of 568  $\mu$ mol triolein, 3.56  $\mu$ mol  $\alpha$ TP, and 396  $\mu$ mol Na-taurocholate in PBS(pH, 6.3). Lymph was collected hourly for 8 h, and the hourly and total amounts of  $\alpha$ TP released into the lymph were determined by a HPLC method. The rate of  $\alpha$ TP absorption was markedly lower starting at 1 h (1.8 nmol/h in ZD vs. 8.5 nmol/h in PF). The peak rates of absorption were observed at 5 h ( $67.1 \pm 16.7$  nmol/h) in ZD rats and at 3 h ( $102.9 \pm 32.2$  nmol/h) in PF rats. The total amounts of  $\alpha$ TP absorbed for 8-h in ZD and PF rats were  $391.1 \pm 54.4$  nmol ( $11.2 \pm 1.4$  % dose) and  $613.9 \pm 105.8$  nmol ( $17.3 \pm 3.1$  % dose), respectively. The findings provide further evidence for a critical role of zinc in the intestinal absorption of lipids and lipids-soluble vitamins, and in the formation and secretion of chylomicrons. Supported by KAES.