심 포 지 움 초 록

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Vitamin E Kinetics, Lipoprotein Transport and Requirements

Maret G. Traber, Ph.D.
Department of Molecular and Cell Biology,
University of California, Berkeley, CA 94720

New techniques of molecular biology and use of stable isotopes have led to new insights in the regulation of plasma vitamin E. During intestinal absorption and chylomicron secretion in humans following oral administration of deuterium labeled tocopherols, all the forms of vitamin E appeared similarly in plasma and distributed to all the circulating lipoproteins. Subsequently, the plasma was preferentially enriched in *RRR*-α-tocopherol as a result of VLDL catabolism. A kinetic model of plasma vitamin E transport in humans using deuterium labeled stereoisomers of α-tocopherol(*RRR*- and *SRR*-, natural and synthetic forms of vitamin E, respectively) demonstrated that *RRR*-α-tocopherol is preferentially returned to the plasma from the liver, accounting for nearly 1 pool of α-tocopherol per day. The hepatic α-tocopherol transfer protein(α-TTP) transfers α-tocopherol, which suggests that it is responsible for the incorporation of *RRR*-α-tocopherol into VLDL. Defects in the α-TTP gene are associated with a characteristic syndrome, ataxia with vitamin E deficiency, AVED. Studies in AVED patients using deuterated tocopherols demonstrated that they have difficulty maintaining plasma *RRR*-α-tocopherol concentrations not as a result of impaired absorption, but as a result of impaired incorporation into VLDL. The importance of α-TTP in maintaining normal plasma vitamin E concentrations will be discussed. In addition, the implications for vitamin E supplementation in normal humans will be addressed.