

건강증진 I			번호: III - F - 1		
제 목	국문	선천성 당뇨병을 가진 Goto-Kakizaki Rat 에서의 Zinc plus Arachidonic acid의 혈당저하 효과에 대한 연구			
	영문	Anti-Diabetic Actions of Arachidonic acid and Zinc in Genetically Diabetic Goto-Kakizaki Rats			
저 자 및 소 속	국문	황인경 ¹⁾ , 이동준 ¹⁾ , 장준호 ¹⁾ , 이희숙 ¹⁾ , 윤혜정 ¹⁾ , 황문영 ¹⁾ , 강동목 ¹⁾ , 조병만 ¹⁾ , 이수일 ¹⁾ , Vay Liang W. Go ²⁾ 1) 부산대학교 의과대학 예방의학 및 산업의학교실, 2) Center for Human Nutrition, UCLA School of Medicine, USA			
	영문	In K. Hwang ¹⁾ , Dong J. Lee ¹⁾ , Jun H. Jang ¹⁾ , Hee S. Lee ¹⁾ , Hye J. Yoon ¹⁾ , Moon Y. Hwang ¹⁾ , Dong M. Kang ¹⁾ , Byung M. Cho ¹⁾ , Su I. Lee ¹⁾ , Vay Liang W. Go ²⁾ 1) Department of Preventive & Occupational Medicine, College of Medicine, Pusan National University, 2) Center for Human Nutrition, UCLA School of Medicine, USA			
분 야	보건관리 건강증진	발 표 자	황인경	발표형식	구 연
			일반회원		
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<p>1. 연구목적</p> <p>In previous studies, we showed that feeding arachidonic acid (AA) supplemented with a fixed amount of zinc lowered blood glucose concentrations in the fed state and water intake in rats with streptozotocin-induced diabetes. The present study was designed to determine dose-dependent effects of AA supplemented with a fixed amount of zinc on fed blood glucose levels, water intake, and glucose tolerance in genetically Type 2 diabetic Goto-Kakizaki (G-K) Wistar rats.</p> <p>2. 연구방법</p> <p>In an acute study, effects of acute administration of 20 mg/kg AA plus 10 mg/kg zinc on glucose disposal were determined in G-K rats. In an chronic study, G-K rats were treated with increasing doses of AA plus zinc in drinking water for 2 weeks. Fed blood glucose, three hour average area-above-fasting glucose concentrations (TAFGC; index of oral glucose tolerance), water intake, plasma insulin concentrations were measured. In in vitro assays, effects of AA plus zinc on muscle glucose uptake were determined.</p> <p>3. 연구결과</p> <p>In an acute study, AA plus zinc administered via gastric gavage significantly improved oral glucose tolerance in G-K rats when compared to rats given distilled water (DW) only. When</p>					

rats were treated chronically with increasing doses of AA , fed blood glucose concentrations and water intake were maximally decreased with diets containing 20 or 30 mg/L AA plus 10 mg/L zinc. TAFGC in diabetic G-K rats treated with 10, 20, or 30 mg/L AA plus 10 mg/L zinc for 2 weeks were significantly decreased relative to DW-treated rats. The effect on TAFGC values was maintained for an additional 2 weeks after cessation of treatment. Plasma insulin levels significantly increased in rats treated with 20 mg/L AA only or 10 mg/L AA plus 10 mg/L zinc, but not in rats treated with 20 or 30 mg/L AA plus 10 mg/L zinc, which are the most effective doses for the improvement of clinical signs of diabetes in G-K rats. In in vitro assays, 0.2 mg/mL AA in the incubation media was optimal for glucose uptake in isolated solenus muscle slices.

4. 고찰

These results suggest that treatment of genetically diabetic G-K rats with AA plus zinc lowers blood glucose levels via improvement of insulin sensitivity.