

Effects of saturated fatty acids on skeletal muscle differentiation in an intrauterine hyperglycemic environment

Tokunaga Yayoi¹, Ritsuko Kawaharada², Chisato Ishida³, Akio Nakamura¹

¹Department of Food and Health Sciences, Jissen Women's University, Hino, Japan, ²Department of Health and Nutrition, Takasaki University of Health and Welfare, Takasaki, Japan, ³Department of nutrition, Japanese Haramachi Red Cross Hospital, Japan

INTRODUCTION: The effect of unsaturated fatty acids on skeletal muscle differentiation in an intrauterine hyperglycemic environment has not been clarified. We explored the effect of maternal nutrition on myotubes formation using the L6 rat myoblast cell model exhibiting hyperglycemia during pregnancy.

METHODS: Rat L6 skeletal myoblasts were grown in DMEM medium containing 100 mg/dL glucose (control), and subsequently it examined the effect of palmitate against the differentiation into myotubes in differentiation medium containing control or 450 mg/L (high glucose). Phospho-Akt was detected by western blotting and the expressions of muscle differentiation markers (*myf5* and *myoD*) were evaluated by real-time PCR.

RESULTS: The gene expression of *myf5* and *myoD* and the level of the Phospho-Akt were significantly higher in high glucose than in control with myogenic differentiation. Palmitate decreased the expression level of *myf5* and *myoD* in 24 hours, however, their expression level increased again after 48 hours. Palmitate also was decreased the Phospho-Akt with differentiation.

CONCLUSION: We showed that palmitate suppressed myogenic differentiation in hyperglycemic condition. We would like to explore the influence of other unsaturated fatty acid against myogenic differentiation.