

Effects of Egg Yolk Peptide on the Retardation of Bone Growth Induced by Low-Calcium Diets

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Abstract : Eggs have long been an important contributor to the nutritional quality of the human, and recognized as a very valuable source of proteins for human nutrition. Egg yolk is composed of various important chemical substances for human health. Growth means not only the increase of body weight but also the elongation of height and the enlargement of each organ's anatomical and morphological size. A calcium shortage causes the growth retardation on the body growth. In this study, we examined the therapeutic effects of egg yolk peptide (EYP) on the retardation of the longitudinal bone growth induced by low-calcium diet (0.05%) in adolescent rats. Low calcium diets were administrated for 15 days. During the last five days, calcium and/or vitamin D and/or EYP were administrated. The body weights, longitudinal bone growth rates, the heights of growth plates, and bone morphogenetic protein (BMP)-2 and insulin-like growth factor (IGF)-1 expressions were measured using histochemical analysis. Low calcium diets caused the significant reduction in body weight gains and the longitudinal bone growth. The heights of growth plates and the expressions of BMP-2 and IGF-1 showed the impairment of body growth as well. Calcium and/or vitamin D administration could not significantly increase the longitudinal bone growth. However, calcium, vitamin D, and EYP administration significantly increased the bone growth, the growth plate height, and BMP-2 and IGF-1 expressions. These results suggest that EYP enhances the longitudinal bone growth in the calcium and/or vitamin D deficiency and it could be a promising agent for the treatment of children suffering from malnutrition.

Keywords : egg yolk peptide, low-calcium diet, longitudinal bone growth, morphogenetic protein-2, insulin-like growth factor-1, vitamin D

Conference Title : ICNFS 2014 : International Conference on Nutrition and Food Sciences

Conference Location : Zurich, Switzerland

Conference Dates : July 30-31, 2014