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Normalizing Effect of Zinc(II) Complex with 6-Ethoxy Picolinic Acid on Blood Glucose Levels in KK-A^y Mice

Mika Morishita[1)], Midori Nishide[1)], Kinuyo Matsumoto[1)], Yusuke Adachi[2)], Yutaka Yoshikawa[2)], Hiromu Sakurai[2)] and Naemi M. Kajiwara[1)]

1) Laboratory of Nutrition Physiology, Graduate School of Life Science, Kobe Women's University
2) Department of Analytical and Bioinorganic Chemistry, Kyoto Pharmaceutical University

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Abstract:
We examined normalizing effect for blood glucose levels of zinc(II) complex with 6-ethoxy picolinic acid ($Zn(6\text{-}EtOpa)_2$) on KK-A^y mice which used in this study as the model animals of type 2 diabetes, and compared with its ligand, 6-ethoxy picolinic acid (6-EtOpa). These mice were divided into three groups after the onset of diabetes at 8 weeks of age, which were an untreated group, a 6-EtOpa treated group, and a $Zn(6\text{-}EtOpa)_2$ treated group. They were given daily intraperitoneal (i.p.) injections of each material for a period of 2 weeks from 8th to 10th week of ages. The dose of $Zn(6\text{-}EtOpa)_2$ was 3 mg Zn/kg of body weight. Each animal was examined for its body weight, food intake, blood glucose level, glucose tolerance, HbA_{1c} level, hematological status, organ weight, and zinc and copper concentrations in the organs. After 2 weeks of administration, the blood glucose level of KK-A^y mice treated with $Zn(6\text{-}EtOpa)_2$ showed a significant decrease compared to both of the 6-EtOpa and control groups. Furthermore, the mice treated with $Zn(6\text{-}EtOpa)_2$ showed decreasing effect on HbA_{1c} levels and increasing effect on glucose tolerance. Zinc (II) concentration in the femur was significantly increased in the $Zn(6\text{-}EtOpa)_2$ treated group compared to the both of 6-EtOpa and control groups. Copper concentration was decreased significantly in both of femur and femoris muscle.

Key words: diabetes, Zn(II) complex, KK-A^{y}, blood glucose level

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