

## The Effect of *Dendrobium nobile* Lindl. Alkaloids on the Blood Glucose and Amyloid Precursor Protein Metabolic Pathways in Db/Db Mice

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**Abstract :** Objectives: There are pathophysiological connections between type 2 diabetes mellitus (T2DM) and Alzheimer's disease (AD), and research on drugs with hypoglycemic and beta-amyloid (A $\beta$ )-clearing effects have great therapeutic potential for AD. *Dendrobium nobile* Lindl. Alkaloids (DNLA) as one of the active compounds of *Dendrobium nobile* Lindl. In this study, we attempted to verify the hypoglycemic effect and investigate the effects of DNLA on the amyloid precursor protein (APP) metabolic pathway of the hippocampus in db/db mice. Methods: 4-weeks-old male C57BL/KsJ mice were the control group. And the same age and sexuality db/db mice were: model, DNLA-L (20 mg/kg), DNLA-M (40 mg/kg), and DNLA-H (80 mg/kg). After, mice were treated with different concentrations of DNLA for 17 weeks. The fasting blood glucose (FBG) was detected by glucose oxidase assay every week from the 4th to last week. The protein expression of  $\beta$ -amyloid 1-42 (A $\beta$ 1-42),  $\beta$ -site amyloid precursor protein-cleaving enzyme 1 (BACE1), and APP were examined by Western blotting. Results: The concentration of FBG and the protein expression of A $\beta$ 1-42, BACE1, and APP were increased in the hippocampus of the model group. Moreover, DNLA not only significantly decreased the concentration of FBG but also reduced the protein expressions of A $\beta$ 1-42, BACE1 and APP in the hippocampus of db/db mice in a dose-dependent manner. Conclusions: DNLA can decrease the protein expressions of A $\beta$ 1-42 in the hippocampus of db/db mice, and the mechanism may be involved in the APP metabolic pathway.

**Keywords :** Alzheimer's disease, type 2 diabetes mellitus,  $\beta$ -site amyloid precursor protein-cleaving enzyme 1, traditional Chinese medicines, beta-amyloid

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