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## The neuro-protective effect of ketogenic diet on mice fed high-fat high-cholesterol (HFHC) diet

Shyh-Hsiang Li, Hsiang Liao, Cicilia Soetento and Dai-Ting Lin

Taipei Medical University, Taiwan

Until 2012, there are more than 190,000 people who are suffering from the dementia. The morbidity is about 8% among those over 65 years old. AD, the most common form of dementia, is also known as the type 3 DM, which is highly correlated to abnormal regulation of insulin and glucose in the brain. Diets high in fat and cholesterol may have negative effects on health. Hyperlipidemia is considered one of the factors causing insulin resistance. On the other hand, hypercholesterolemia can cause BBB damage and promote the production of beta-amyloid (A $\beta$ ) as well as increasing in oxidative stress. Ketone bodies are anti-oxidative and an alternative source of energy when glucose is no longer an energy source, which is useful under the condition of insulin resistance. In this study, a high-fat/high-cholesterol (HFHC) diet is given to mice for 16 weeks to induce insulin resistance and BBB damage, followed by feeding the mice a ketogenic diet or an HFHC diet with Metformin. We expect to observe that after receiving the ketogenic diet, the cognitive ability and the expression of AD-related proteins are regulated, in which the mechanism regarding the effect of a ketogenic diet will be clarified.

lin5611@tmu.edu.tw

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