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A new way to produce hyperketonemia: use of ketone ester in a case of Alzheimer's disease

Mary T Newport [1], Theodore B VanItallie [2], Yoshihiro Kashiwaya [3], Michael Todd King [4], Richard L Veech [5]

Affiliations

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Abstract

Background: Providing ketone bodies to the brain can bypass metabolic blocks to glucose utilization and improve function in energy-starved neurons. For this, plasma ketones must be elevated well above the ≤ 0.2 mM default concentrations normally prevalent. Limitations of dietary methods currently used to produce therapeutic hyperketonemia have stimulated the search for better approaches.

Method: Described herein is a new way to produce therapeutic hyperketonemia, entailing prolonged oral administration of a potent ketogenic agent--ketone monoester (KME)--to a patient with Alzheimer's disease dementia and a pretreatment Mini-Mental State Examination score of 12.

Results: The patient improved markedly in mood, affect, self-care, and cognitive and daily activity performance. The KME was well tolerated throughout the 20-month treatment period. Cognitive performance tracked plasma β-hydroxybutyrate concentrations, with noticeable improvements in conversation and interaction at the higher levels, compared with predose levels.

Conclusion: KME-induced hyperketonemia is robust, convenient, and safe, and the ester can be taken as an oral supplement without changing the habitual diet.

Keywords: Brain insulin resistance; Fasting; Ketogenic diet; Ketone bodies; Ketone monoester; Medium-chain triglyceride; Pyruvate dehydrogenase; β-Hydroxybutyrate.

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Figures

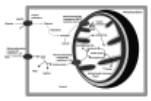

Figure 1 Glucose and the ketone bodies,...

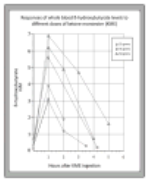

Figure 2 β-hydroxybutyrate (βHB) concentrations rose to...

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