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題名 ; Lauric acid stimulates ketone body production in astrocyte cell line

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Coconut oil has attracted considerable attention as a potentially therapeutic substance for Alzheimer's disease, because it contains a large amount of medium-chain fatty acids (MCFAs). Its consumption is thought to stimulate hepatic ketogenesis, supplying an alternative energy source for the brain with impaired glucose metabolism.

In this study, we first observed the responses of plasma ketone bodies to oral administration of coconut oil, in rats. We found that the coconut oil-induced increase in plasma ketone body concentration was negligible and did not significantly differ from that observed after high-oleic sunflower oil administration. In contrast, the administration of coconut oil substantially increased the plasma free fatty acid concentration, including lauric acid, which is the major MCFA in coconut oil.

We then tried to elucidate whether lauric acid can activate ketogenesis in astrocytes. It is known that astrocytes have the capacity to generate ketone bodies from certain fatty acids. Thus we treated an astrocyte cell line with lauric acid. Total ketone body concentration in the supernatant of the lauric-acid-treated cell line increased to a greater extent than that with oleic acid, suggesting that lauric acid can directly and potently activate ketogenesis in astrocytes. These results suggest that coconut oil intake may improve brain health by directly activating ketogenesis in astrocytes and thereby providing fuel to neighboring neurons.