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Hydrogen-related enhancement of in vivo antioxidant ability in the brain of rats fed coral calcium hydride

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Abstract

This study explored the effect of coral calcium hydride (CCH) on rat intrahippocampal antioxidant ability by measuring the PCAM nitroxide radical decay ratio when CCH was (a) co-perfused into the hippocampus and (b) fed orally to the rats for 4 weeks under a freely moving state. Estimation of the in vivo antioxidant effect was obtained by administration of the blood-brain barrier-permeable PCAM nitroxide radical and the measured PCAM radical decay ratio then correlated to the amount of antioxidant in the brain using electron spin resonance (ESR) spectroscopy combined with microdialysis. The half-life periods of PCAM in rats treated with CCH in both the co-perfusion and orally fed groups were significantly shorter compared to the control group. These results clarify the mechanism that CCH may exert antioxidant activity by significantly enhancing the basal endogenous antioxidant ability in the hippocampus through a synergistic effect with α -tocopherol and ascorbic acid.

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