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Oral 'hydrogen water' induces neuroprotective ghrelin secretion in mice

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Abstract

The therapeutic potential of molecular hydrogen (H₂) is emerging in a number of human diseases and in their animal models, including in particular Parkinson's disease (PD). H₂ supplementation of drinking water has been shown to exert disease-modifying effects in PD patients and neuroprotective effects in experimental PD model mice. However, H₂ supplementation does not result in detectable changes in striatal H₂ levels, indicating an indirect effect. Here we show that H₂ supplementation increases gastric expression of mRNA encoding ghrelin, a growth hormone secretagogue, and ghrelin secretion, which are antagonized by the β₁-adrenoceptor blocker, atenolol. Strikingly, the neuroprotective effect of H₂ water was abolished by either administration of the ghrelin receptor-antagonist, D-Lys(3) GHRP-6, or atenolol. Thus, the neuroprotective effect of H₂ in PD is mediated by enhanced production of ghrelin. Our findings point to potential, novel strategies for ameliorating pathophysiology in which a protective effect of H₂ supplementation has been demonstrated.

Figures

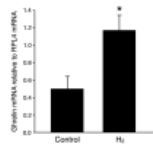


Figure 1. Oral H₂ water increases...

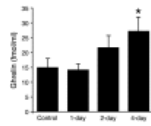


Figure 2. Plasma ghrelin levels following administration...

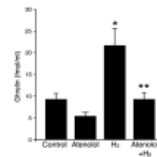


Figure 3. H₂ water increases plasma...

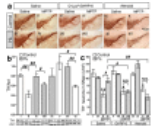


Figure 4. Inhibition of ghrelin secretion or...

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