

FULL TEXT LINKS



Br J Pharmacol. 2013 Mar;168(6):1412-20. doi: 10.1111/bph.12036.

Hydrogen water consumption prevents osteopenia in ovariectomized rats

Ji-Dong Guo ¹, Li Li, Ya-Min Shi, Hua-Dong Wang, Shu-Xun Hou

Affiliations

PMID: 23121335 PMCID: [PMC3596646](#) DOI: [10.1111/bph.12036](#)

[Free PMC article](#)

Abstract

Background and purpose: Accumulating evidence indicates an important role of oxidative stress in the progression of osteoporosis. Recently, it was demonstrated that hydrogen gas, as a novel antioxidant, could selectively reduce hydroxyl radicals and peroxynitrite anion to exert potent therapeutic antioxidant activity. The aim of the present work was to investigate the effect of hydrogen water (HW) consumption on ovariectomy-induced osteoporosis.

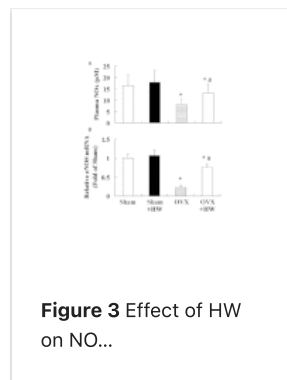
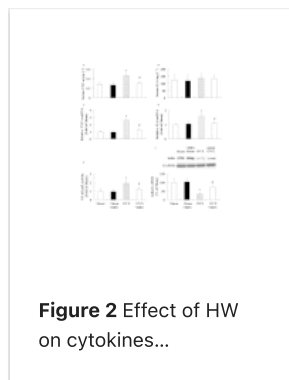
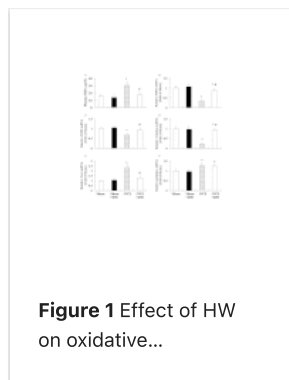
Experimental approach: Ovariectomized rats were fed with HW ($1.3 \pm 0.2 \text{ mg}\cdot\text{L}^{-1}$) for 3 months. Then, blood was collected and femur and vertebrae were removed for evaluation of the effect of HW on bone.

Key results: HW consumption in ovariectomized rats had no significant effect on oestrogen production, but prevented the reduction of bone mass including bone mineral content and bone mineral density in femur and vertebrae, and preserved mechanical strength including ultimate load, stiffness, and energy, and bone structure including trabecular bone volume fraction, trabecular number, and trabecular thickness in femur, and preserved mechanical strength including ultimate load and stiffness, and bone structure including trabecular bone volume fraction and trabecular number in vertebrae. In addition, treatment with HW abated oxidative stress and suppressed IL-6 and TNF- α mRNA expressions in femur of ovariectomized rats; treatment with HW increased femur endothelial NOS activity and enhanced circulating NO level in ovariectomized rats.

Conclusions and implications: HW consumption prevents osteopenia in ovariectomized rats possibly through the ablation of oxidative stress induced by oestrogen withdrawal.

© 2012 The Authors. British Journal of Pharmacology © 2012 The British Pharmacological Society.

Figures



Related information

[MedGen](#)

[PubChem Compound \(MeSH Keyword\)](#)

LinkOut - more resources

Full Text Sources

[Europe PubMed Central](#)

[Ovid Technologies, Inc.](#)

[PubMed Central](#)

[Wiley](#)

Other Literature Sources

[The Lens - Patent Citations](#)

[scite Smart Citations](#)

Medical

[MedlinePlus Health Information](#)