

FULL TEXT LINKS



Chin Med J (Engl). 2016 Oct 5;129(19):2331-7. doi: 10.4103/0366-6999.190668.

Hydrogen-rich Water Exerting a Protective Effect on Ovarian Reserve Function in a Mouse Model of Immune Premature Ovarian Failure Induced by Zona Pellucida 3

Xin He ¹, Shu-Yu Wang ¹, Cheng-Hong Yin ¹, Tong Wang ¹, Chan-Wei Jia ¹, Yan-Min Ma ¹

Affiliations

PMID: 27647193 PMID: [PMCS040020](#) DOI: [10.4103/0366-6999.190668](#)

[Free PMC article](#)

Abstract

Background: Premature ovarian failure (POF) is a disease that affects female fertility but has few effective treatments. Ovarian reserve function plays an important role in female fertility. Recent studies have reported that hydrogen can protect male fertility. Therefore, we explored the potential protective effect of hydrogen-rich water on ovarian reserve function through a mouse immune POF model.

Methods: To set up immune POF model, fifty female BALB/c mice were randomly divided into four groups: Control (mice consumed normal water, n = 10), hydrogen (mice consumed hydrogen-rich water, n = 10), model (mice were immunized with zona pellucida glycoprotein 3 [ZP3] and consumed normal water, n = 15), and model-hydrogen (mice were immunized with ZP3 and consumed hydrogen-rich water, n = 15) groups. After 5 weeks, mice were sacrificed. Serum anti-Müllerian hormone (AMH) levels, granulosa cell (GC) apoptotic index (AI), B-cell leukemia/lymphoma 2 (Bcl-2), and BCL2-associated X protein (Bax) expression were examined. Analyses were performed using SPSS 17.0 (SPSS Inc., Chicago, IL, USA) software.

Results: Immune POF model, model group exhibited markedly reduced serum AMH levels compared with those of the control group (5.41 ± 0.91 ng/ml vs. 16.23 ± 1.97 ng/ml, $P = 0.033$) and the hydrogen group (19.65 ± 7.82 ng/ml, $P = 0.006$). The model-hydrogen group displayed significantly higher AMH concentrations compared with that of the model group (15.03 ± 2.75 ng/ml vs. 5.41 ± 0.91 ng/ml, $P = 0.021$). The GC AI was significantly higher in the model group ($21.30 \pm 1.74\%$) than those in the control ($7.06 \pm 0.27\%$), hydrogen ($5.17 \pm 0.41\%$), and model-hydrogen groups ($11.24 \pm 0.58\%$) (all $P < 0.001$). The GC AI was significantly higher in the model-hydrogen group compared with that of the hydrogen group ($11.24 \pm 0.58\%$ vs. $5.17 \pm 0.41\%$, $P = 0.021$). Compared with those of the model group, ovarian tissue Bcl-2 levels increased (2.18 ± 0.30 vs. 3.01 ± 0.33 , $P = 0.045$) and the Bax/Bcl-2 ratio decreased in the model-hydrogen group.

Conclusions: Hydrogen-rich water may improve serum AMH levels and reduce ovarian GC apoptosis in a mouse immune POF model induced by ZP3.

Figures

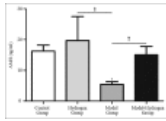


Figure 1 Effects of hydrogen-rich water on...

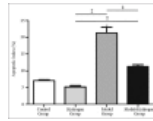


Figure 2 Effects of hydrogen-rich water on...

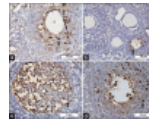


Figure 3 Morphology analysis of ovarian apoptotic...

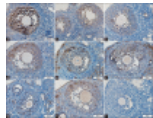


Figure 4 Immunohistochemical staining for Bax in...

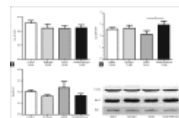


Figure 5 Bax and Bcl-2 expression determined...

Related information

[MedGen](#)

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

LinkOut - more resources

Full Text Sources

[Europe PubMed Central](#)

[Ovid Technologies, Inc.](#)

[PubMed Central](#)

[Wolters Kluwer](#)

Other Literature Sources

[The Lens - Patent Citations](#)

[scite Smart Citations](#)

Medical

[MedlinePlus Health Information](#)

Research Materials

[NCI CPTC Antibody Characterization Program](#)

Miscellaneous

[NCI CPTAC Assay Portal](#)