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# Hydrogen saline prevents selenite-induced cataract in rats

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## Abstract

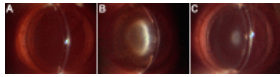
**Purpose:** The aim of this study was to investigate the potential antioxidative effect and mechanism for the protective effects of hydrogen saline on selenite-induced cataract in rats.

**Methods:** Sprague-Dawley rat pups were divided into the following groups: control (Group A), selenite induced (Group B), and selenite plus hydrogen saline treated (Group C). Rat pups in Groups B and C received a single subcutaneous injection of sodium selenite (25  $\mu\text{mol/kg}$  bodyweight) on postnatal day 12. Group C also received an intraperitoneal injection of H<sub>2</sub> saline (5 ml/kg bodyweight) daily from postnatal day 8 to postnatal day 17. The development of cataract was assessed weekly by slit-lamp examination for 2 weeks. After sacrifice, extricated lenses were analyzed for activities of superoxide dismutase, catalase, glutathione peroxidase, glutathione reductase, and glutathione S-transferase, levels of malondialdehyde, reduced glutathione (GSH), and total sulfhydryl contents.

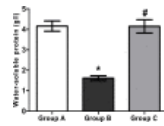
**Results:** The magnitude of lens opacification in Group B was significantly higher than in Group A ( $p < 0.05$ ), while Group C had less opacification than Group B ( $p < 0.05$ ). Compared with Group B, the mean activities of the antioxidant enzymes superoxide dismutase, catalase, glutathione peroxidase, glutathione reductase, and glutathione S-transferase, levels of GSH, and total sulfhydryl contents were higher, whereas the level of malondialdehyde was lower following treatment with hydrogen saline ( $p < 0.05$ ).

**Conclusions:** This is an initial report showing that hydrogen saline can prevent selenite-induced cataract in rats. It acts via maintaining antioxidant enzymes and GSH, protecting the sulfhydryl group, and inhibiting lipid peroxidation.

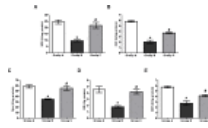
## Figures



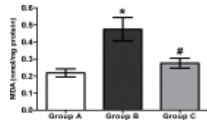
**Figure 1** Lens opacification in the eyes...



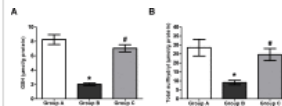
**Figure 2** The concentrations of water-soluble proteins...



**Figure 3** The activities of antioxidant enzymes...



**Figure 4** The level of malondialdehyde (a...



**Figure 5** The levels of reduced glutathione...

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