Propofol protects oxidative stress-induced COS-7 cell death by induction of autophagy

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Background

In oxidative stress, reactive oxygen species (ROS) production contribute cellular dysfunction and cell apoptosis. And autophagy is though the mechanism for decreasing ROS concentration and oxidative damage. Propofol presents antioxidant properties. So in this study, we investigated whether the propofol preconditioning protects cell damage from hydrogen peroxide-induced oxidative stress and influences on cellular autophagy

Materials and Method

The groups were randomly divided into the following groups: Control; cells were incubated in normoxia (5% CO₂, 21% O₂ and 74% N₂) without propofol, hydrogen peroxide (H₂O₂); cells were exposed to 24 h H₂O₂ (400μM), propofol preconditioning (PPC)+ H₂O₂; cells pretreated with propofol were exposed to H₂O₂, 3-Methyladenine (3-MA)+PPC+ H₂O₂; cells pretreated with 3-MA (1mM) 1 h and propofol were exposed to H₂O₂. Cell viability was determined with MTT reduction. Apoptosis was determined by Hoechst 33342 staining. Relation with autophagy was detected with western blot analysis.

Results

Cell viability decreased significantly in H₂O₂ group and which was improved by propofol preconditioning. Propofol effectively decreased H₂O₂-induced COS-7 cell apoptosis. However, 3-MA inhibited the protective effect of propofol at cell apoptosis. In western blot analysis, autophagy related proteins were increased in PPC+H₂O₂ group compared.

Conclusions

This study suggests that propofol preconditioning has protective effect on H₂O₂-induced COS-7 cell death, which is mediated by autophagy activation.