عنوان مقاله:

Mechanism of Sodium Selenite-Induced Cataract Through Autophagy in Wistar (Rattus norvegicus) Rats

محل انتشار:

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خلاصه مقاله:

Cataracts are characterized by the clouding of the eye lens, resulting from changes in lens metabolism that can lead to lens hydration (fluid accumulation), denaturation of lens proteins, or both. Autophagy is a subcellular process involving the recycling of damaged proteins or organelles by lysosomes. Inhibition of autophagy in lens cells can hinder cell differentiation, contributing to cataract formation. Understanding the functional role of autophagy in lens tissue is essential for considering it as a potential therapeutic strategy for cataract treatment. This study involved several statistical analysis tests, including descriptive statistics to calculate the mean and standard deviation (SD), data normality tests to assess data distribution, data homogeneity tests to examine data diversity, and the Homogeneity of Variance test. A t-test was conducted to assess significant differences between the two independent test groups. Statistical analysis was performed using SPSS version ۲۰.۰. This study explored the role of the autophagy pathway in cataracts induced by oxidative stress, focusing on the expression of ROS, SOD, mTOR, LC۳-II, p-۶۲, IL-۱β, Caspase-۳, and lens tissue histology. Cataract formation was clinically examined in the eye lens of experimental animals. Immunohistochemical methods were used to analyze ROS, SOD, LC۳-II, p-۶۲, IL-۱β, and Caspase-۳. ROS, SOD, LC۳-II, and p۶۲ were collected from the anterior lens capsule, while IL-۱β and Caspase-۳ were collected from the eye lens. mTOR expression was collected from the lens capsule and determined by Western blot. The expression levels of mTOR, ROS, SOD, LC۳-II, and caspase-۳ in Wistar rats induced by the sodium selenite cataract model were lower than those in the control group. On the other hand, ROS expression and IL-۱β expression in the sodium selenite-induced cataract model of Wistar rats were higher than those in the controls. The mechanism underlying cataract formation in Wistar rats induced by sodium selenite involves autophagy, as evidenced by the expression of ROS, LC۳-II, IL-۱β, and caspase-۳.

کلمات کلیدی:

Sodium selenite, Autophagy, oxidative stress, cataracts