Role of Allantoin on the Oxidative Stress in a Mouse Model of Nonalcoholic Steatohepatitis

Ali Rostamani[1*], Zeinab Hamidi-zad[2], Azam Moslehi[2], Fatemeh Heidari[2]

[1]Student Research Committee, Qom University of medical sciences, Qom, Iran
[2]Department of medical sciences, Cellular & Molecular Research Center, Qom, Iran

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***Corresponding Author:**
Student Research Committee, Qom University of medical sciences, Qom, Iran

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ABSTRACT

Introduction: Nonalcoholic steatohepatitis (NASH) is considered a common and severe liver disease that develops into cirrhosis, fibrosis, and even hepatocellular carcinoma. Oxidative stress is identified as an important factor in the induction and promotion of NASH. Allantoin is a natural and safe compound with notable effects on lipid metabolism, inflammation, and oxidative stress. Therefore, this study aimed to assess the role of allantoin on oxidative stress in a mouse model of nonalcoholic steatohepatitis.

Methods and Materials: The C57/BL6 male mice received saline and allantoin (saline as the control and allantoin as the positive control groups). NASH was induced by a methionine-choline deficient diet (MCD). In the NASH-allantoin (NASH-Alla) group, allantoin was injected for four weeks in the mice feeding on an MCD diet. Afterward, histopathological, serum, oxidative stress, and Western blot evaluations were performed.

Results: Our results showed that NASH provided hepatic lipid accumulation and inflammation. Superoxide dismutase and glutathione (GSH) levels decreased, and lipid peroxidation increased. However, allantoin treatment decreased serum cholesterol, ALT, and AST. Liver steatosis and inflammation were improved. SOD, CAT, and GSH levels increased, and lipid peroxidation decreased.

Conclusion and Discussion: Allantoin, with rising levels of antioxidant enzymes such as GSH and lowering of lipid peroxidation, could attenuate the consequences of NASH disease. Therefore, allantoin could be considered an antioxidant and attractive candidate for NASH treatment. Future studies can help confirm this hypothesis.

Keywords: Amygdalin, Melanoma, Neoplasms

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