عنوان مقاله:

Methylene Blue Improves Mitochondrial Function in The Liver of Cholestatic Rats

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نویسندگان:

Reza Heidari - *Shiraz University of Medical Sciences, Pharmaceutical Sciences Research Center*

Asrin Ahmadi - *Pharmaceutical Sciences Research Center, Shiraz university of Medical Sciences, Shiraz, Iran*

Mohammad Mehdi Ommati - *College of Life Sciences, Shanxi Agricultural University, Taigu, Shanxi ۰۳۰۸۰۱, Peoples' Republic of China*

Hossein Niknahad - *Department of Pharmacology-Toxicology, School of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran.*

خلاصه مقاله:

Different diseases or xenobiotics could cause cholestasis. The only promising treatment for this disease is the identification of its etiology or liver transplantation in severe cases. Nevertheless, preserving liver function could delay organ injury or help to the treatment of the disease in mild cases. The mechanism of cholestasis-induced liver injury is multifactorial. However, it has been found that hepatocyte mitochondrial function is impaired in this disease. Methylene blue (MB) is a phenothiazine compound. MB is pharmacologically used for a wide range of diseases. It has been found that this compound could significantly improve mitochondrial function and prevent the releases of cell death mediators from this organelle. MB is also well-known for its preventing effect on mitochondria-facilitating reactive oxygen species (ROS) formation. It has been found that mitochondrial function is impaired in the liver tissue in different models of cholestasis. The current study aimed to evaluate the effects of MB administration on mitochondrial indices in cholestatic animals. Rats underwent bile duct ligation (BDL) surgery and treated with MB (0.5 and 1 mg/kg, oral). Significant mitochondrial permeabilization, mitochondrial membrane depolarization, lipid peroxidation, decreased mitochondrial dehydrogenase activity, and depleted ATP content was evident in BDL rats. It was found that mitochondrial indices improved in MB-treated cholestatic animals. Based on the data collected in this study, MB might be useful as a therapeutic agent in cholestasis. The mitochondria protecting properties of this compound could play a major role in its mechanism of action.

کلمات کلیدی:

Bile Acids, Bioenergetics, Cholestasis, Liver failure, Mitochondria, Oxidative stress