Effect of Curcumin on Alloxan Induced Diabetes Mellitus in Mice

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Alloxan, also referred to by its chemical name 5,5-dihydroxyl pyrimidine-2,4,6-trione, is a carcinogen, cytotoxic glucose analog, and organic compound. Alloxan is one of the common diabetogenic agents frequently used to evaluate the antidiabetic potential of both pure compounds and plant extracts. Alloxan has been administered in single or multiple doses via a variety of routes. Through the GLUT2 glucose transporter, toxic glucose analogs such as alloxan and streptozotocin preferentially accumulate in pancreatic beta cells. Dialuric acid, the reduction product of alloxan is produced in a cyclic redox reaction with reactive oxygen species (ROS) in the presence of intracellular thiols particularly glutathione. Dialuric acid undergoes autoxidation, producing superoxide radicals, hydrogen peroxide, and hydroxyl radicals in the last stage of the reaction that is catalyzed by iron. The death of the beta cells, which have a notably low capacity for antioxidant defense, turmeric is a rhizomatous perennial medicinal plant (Curcumalonga) that has been used since ancient times in Asian countries such as China and Southeast Asia. Curcumin supports novel signaling mechanisms involved in the pathophysiology of diabetes, including glucagon-like peptide-1, dipeptidyl peptidase-4, glucose transporters, α-glycosidase, α-amylase, and peroxisome proliferator-activated receptor γ (PPARγ), in addition anti-inflammatory and antioxidant activities. Keywords: Curcumin; Alloxan; Anti-inflammatory; Hyperglycemia; Albino Mice.

Biography

Samia Elzwi is an Assistant Professor in the Department of Pharmacology at the Faculty of Medicine, University of Benghazi, Libya. With a strong academic background and expertise in pharmacological sciences, she is dedicated to advancing medical education, research, and healthcare practices in Libya.