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Anti-diabetic effects of electrolyzed reduced water in streptozotocin-induced and genetic diabetic mice.

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Oxidative stress is produced under diabetic conditions and is likely involved in progression of pancreatic beta-cell dysfunction found in diabetes. Both an increase in reactive oxygen free-radical species (ROS) and a decrease in the antioxidant defense mechanism lead to the increase in oxidative stress in diabetes. Electrolyzed reduced water (ERW) with ROS scavenging ability may have a potential effect on diabetic animals, a model for high oxidative stress. Therefore, the present study examined the possible anti-diabetic effect of ERW in two different diabetic animal models. The genetically diabetic mouse strain C57BL/6J-db/db (db/db) and streptozotocin (STZ)-induced diabetic mouse were used as insulin deficient type 1 and insulin resistant type 2 animal model, respectively. ERW, provided as a drinking water, significantly reduced the blood glucose concentration and improved glucose tolerance in both animal models. However, ERW fail to affect blood insulin levels in STZ-diabetic mice whereas blood insulin level was markedly increased in genetically diabetic db/db mice. This improved blood glucose control could result from enhanced insulin sensitivity, as well as increased insulin release. The present data suggest that ERW may function as an orally effective anti-diabetic agent and merit further studies on its precise mechanism.
PMID:16945392

Kidney Int. 2006 Jul;70(2):391-8. Epub 2006 Jun 7.

Preservative Effect of Electrolyzed Reduced Water on Pancreatic Beta-Cell Mass in Diabetic db/db Mice

Biological & Pharmaceutical Bulletin 2007 Feb;30(2):234-6

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Oxidative stress is produced under diabetic conditions and involved in progression of pancreatic β-cell dysfunction. Both an increase in reactive oxygen free-radical species (ROS) and a decrease in the antioxidant defense mechanism lead to the increase in oxidative stress in diabetes. Electrolyzed reduced water (ERW) with ROS scavenging ability may have a potential effect on diabetic animals, a model for high oxidative stress. Therefore, the present study examined the possible anti-diabetic effect of ERW in genetically diabetic mouse strain C57BL/6J-db/db (db/db). ERW with ROS scavenging ability reduced the blood glucose concentration, increased blood insulin level, improved glucose tolerance and preserved β-cell mass in db/db mice. The present data suggest that ERW may protects β-cell damage and would be useful for antidiabetic agent.

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