

Erythritol is a sweet antioxidant.

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Abstract

OBJECTIVE:

Hyperglycemia, oxidative stress, and the onset and progression of diabetic complications are strongly linked. Reduction of oxidative stress could be of utmost importance in the long-term treatment of diabetic patients. The chronic nature of the disease calls for a mode of antioxidant intake that can be sustained easily, e.g., by the diet. Erythritol, a simple polyol, could be such a compound. It is orally available, well tolerated, and its chemical structure resembles that of mannitol, a well-known hydroxyl radical (HO*) scavenger.

METHODS:

We studied the antioxidant properties of erythritol in vitro and subsequently determined its antioxidant activity and its vasoprotective effect in the streptozotocin diabetic rat.

RESULTS:

Erythritol was shown to be an excellent HO* radical scavenger and an inhibitor of 2,2'-azobis-2-amidinopropane dihydrochloride-induced hemolysis but inert toward superoxide radicals. High-performance liquid chromatographic and electron spin resonance spectroscopy studies showed that the reaction of erythritol with hydroxyl radicals resulted in the formation of erythrose and erythrulose by abstraction of a carbon-bound hydrogen atom. In the streptozotocin diabetic rat, erythritol displayed an endothelium-protective effect and, in accordance with the in vitro experiments, erythrose was found in the urine of erythritol-consuming rats.

CONCLUSION:

Erythritol acts as an antioxidant in vivo and may help protect against hyperglycemia-induced vascular damage.