

Abstract

Int J Tissue React. 2005;27(3):145-50.

The effects of alpha-lipoic acid on nitric oxide synthetase dispersion in penile function in streptozotocin-induced diabetic rats.

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BACKGROUND: Diabetes-induced erectile dysfunction is one of the most prevalent complications of diabetes in males. alpha-Lipoic acid (ALA) and its reduced form, dihydrolipoic acid, are powerful antioxidants. Data strongly suggest that, because of its antioxidant properties, ALA is particularly suited to the prevention and/or treatment of diabetic complications that arise from overproduction of reactive oxygen and nitrogen.

OBJECTIVE: The aim of this study was to investigate the localization of nitric oxide synthetase (NOS) in normal and diabetic rat cavernous smooth muscles and to examine the effects of ALA on them.

METHODS: Rats were divided into four groups: control, diabetic, diabetic plus ALA, and ALA only. Penile tissues were taken 15 days after drug application and examined histochemically and immunohistochemically.

RESULTS: Comparison of the control and diabetic groups revealed that the axons of nerve cells were not identified with Masson trichrome in the diabetic group, whereas in the control group NOS localization and immunostaining (endothelial NOS [eNOS]) were normal. Diabetic rats administered ALA showed improvement in Masson trichrome, nicotinamide adenine dinucleotide phosphate diaphorase (NADPH-d) and eNOS localization compared with untreated diabetic rats. Although there was no difference between the control group and the group administered ALA only, we observed an increase in NADPH-d and eNOS.

CONCLUSIONS: In erection, eNOS and neuronal NOS (nNOS) may have a significant role. In pathologic conditions, erectile dysfunction may occur as a result of an increase in inducible macrophage-type NOS (iNOS). ALA plays an important role in treatment of erectile dysfunction by decreasing iNOS and increasing other isoforms of NOS.

PMID: 16372481