

Ozone Partially Prevents Diabetic Neuropathy in Rats

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Abstract

Neuropathy is one of the most common complications of diabetes mellitus. Although the beneficial effects of good blood glucose control on diabetic neuropathy are known, this control cannot completely prevent the occurrence and progression of diabetic neuropathy. The aim of this study was to investigate whether ozone prevents diabetic neuropathy. 36 adult female Sprague-Dawley rats were randomly divided into 6 groups (n=6): control (C), ozone (O), diabetic (D), ozone-treated diabetic (DO), insulin-treated diabetic (DI), and ozone- and insulin-treated diabetic (DOI). Diabetes was induced by a single injection of streptozotocin (60 mg/kg, intraperitoneal [i.p.]), after which insulin was administered (3 IU, i.p.) to the DI and DOI groups for 28 days, and 1.1 mg/kg (50 µg/ml) ozone was given to the O, DO, and DOI groups for 15 days. 4 weeks after the induction of diabetes, the nerve conduction velocity (NCV), amplitude of the compound action potential (CAP), total oxidant status (TOS), and total antioxidant status (TAS) were measured, and the oxidative stress index (OSI) was calculated. The NCV, amplitude of CAP, and TAS of the DI and DOI groups were higher than those of the D group; the amplitudes of CAP and TAS of the DO group were higher than those of the D group; and the TOS and OSI of the DO, DI, and DOI groups were lower than those of the D group. These findings indicate that ozone partially prevents diabetic neuropathy in rats. It appears that the preventive effects of ozone are mediated through oxidant/antioxidant mechanisms.

Key words

diabetes - insulin - neuropathy - ozone - oxidative stress