

THE EFFECT OF CYCLOHEXENONIC LONG-CHAIN FATTY ALCOHOL ON STZ-INDUCED DIABETIC RATS

Hypothesis / aims of study

It is believed that cyclohexenonic long-chain fatty alcohol makes the central dendrites grow and that this effect is brought about through notch signals. Several experiments have also been reported on the effect of this substance on the peripheral nerves, but its mechanism has not yet been fully clarified.

Using STZ-induced diabetic rats, therefore, we evaluated the effect of cyclohexenonic long-chain fatty alcohol on the peripheral nerves.

Study design, materials and methods

7-week-old Wistar female rats were divided into three groups: normal (Control); diabetic (DM); cyclohexenonic long-chain fatty alcohol-treated diabetic (DM+C). After fasting for 24 hours, the DM and DM+C groups were intraperitoneally given 50mg/kg STZ en bloc. Their serum glucose level was measured 24 hours later, and confirmed to be 250mg/dl or more. Four weeks after the STZ injection, the DM+C group further received a daily peritoneal injection of 8mg/kg cyclohexenonic long-chain fatty alcohol for four weeks.

At the eighth week, all three groups were examined for the bladder function by means of 24-hour frequency volume recording and cystometry. The histopathological changes in the peripheral nerves were also evaluated using S-100 immunohistochemical staining.

Results

As to the 24-hour frequency volume recording, in comparison with the Control, the DM and DM+C groups showed significant increases in the volume excreted per day, number of micturitions per day, average micturition volume and maximal micturition volume. In the DM+C groups, both average and maximal micturition volume was smaller than that in the DM groups.

The cystometry analyses revealed that bladder capacity and residual urine were significantly smaller in the DM+C than in the DM groups.

Immunoreactivity of S-100 markedly decreased in DM groups, compared with that of the Control. Whether, DM+C groups showed significantly increased expression of S-100, compared with DM groups.

Interpretation of results

The bladder function in STZ-induced diabetic rats becomes hypoactive eight weeks after the disease onset. Yet the administration of cyclohexenonic long-chain fatty alcohol decreased the maximal micturition volume, bladder capacity, and residual urine, indicating its alleviative effects on diabetic bladder dysfunction.

Concluding message

Cyclohexenonic long-chain fatty alcohol may alleviate peripheral nerve disorder and improved the bladder function in STZ-induced diabetic rats.

<i>Specify source of funding or grant</i>	Nothing
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	ANIMAL
<i>Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?</i>	Yes
<i>Name of ethics committee</i>	Ethical committee of Nihon University School of Medicine