

Hexarelin promotes the survival of retinal ganglion cells after optic nerve transection

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Abstract:

OBJECTIVE: Hexarelin is a growth hormone secretagogue receptor type 1a agonist with a potent anti-apoptotic effect. We studied the neuroprotective effect of hexarelin on the survival of retinal ganglion cells (RGCs) in the retina following optic nerve transection (ONT).

MATERIALS AND METHODS: Golden hamsters of 8–9 weeks old were used. For 7 days following ONT with one dose of drug, hamsters were injected with single dose of saline, 25 $\mu\text{g}/\text{kg}$, 50 $\mu\text{g}/\text{kg}$, and 100 $\mu\text{g}/\text{kg}$ hexarelin daily for 5 days. For 7 days after ONT with two doses of drugs, saline, 100 $\mu\text{g}/\text{kg}$ and 150 $\mu\text{g}/\text{kg}$ hexarelin were injected twice daily for 5 days. Survival of RGCs was quantified by immunostaining with Tuj1 antibody in retina whole mount.

RESULTS: Single daily doses of 25 $\mu\text{g}/\text{kg}$, 50 $\mu\text{g}/\text{kg}$, and 100 $\mu\text{g}/\text{kg}$ hexarelin dose dependently and significantly increased the survival of RGC. The survival rates of RGC in saline, 25 $\mu\text{g}/\text{kg}$, 50 $\mu\text{g}/\text{kg}$, and 100 $\mu\text{g}/\text{kg}$ hexarelin-treated hamsters were 51.2%, 62.4%, 68.5%, and 74.6%, respectively, in 7 days ONT. Two daily doses of saline, 100 $\mu\text{g}/\text{kg}$ and 150 $\mu\text{g}/\text{kg}$ hexarelin promoted survivals to 72.9%, 91.4%, and 109.2%, respectively, in 7 days ONT.

CONCLUSIONS: Single daily doses of hexarelin dose dependently increased the survival of RGC. Two daily doses of hexarelin increased RGC survival further and 150 $\mu\text{g}/\text{kg}$ hexarelin twice daily is optimal for the survival of RGC.

Keywords:

Ghrelin, growth hormone secretagogue receptor type 1a, neuroinjury