Evaluation of insulin-like growth factor-1 for prevention of radiation-induced spinal cord damage.

AIM: To test whether insulin-like growth factor-1 (IGF-1) ameliorates radiation-induced spinal cord myelopathy and to establish the dose-effect relationship for this growth factor which has not been administered in conjunction with spinal cord irradiation to date. METHODS: Animal experiments were conducted to test the feasibility of IGF-1 injection in a model of cervical spinal cord irradiation in adult Fisher F-344 rats and to determine the most effective dose level of IGF-1. Irradiation was given in two fractions (16 Gy followed by 18 Gy) and animals were examined for the development of paresis (follow-up 12 months). RESULTS: The dose-finding experiment revealed significant differences in the incidence of radiation myelopathy (RM). The most effective dose of IGF-1 was 50 microg per day. CONCLUSIONS: IGF-1 showed promising activity as a radioprotective agent in a model of high-dose spinal cord irradiation. Further studies are needed to examine the results with multiple small doses of radiation as widely applied in clinical protocols.