Effects of VEGF suppression by small hairpin RNA interference combined with radiotherapy on the growth of cervical cancer

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Received May 16, 2013
Accepted October 2, 2013
Published July 7, 2014
DOI http://dx.doi.org/10.4238/2014.July.7.2

ABSTRACT. This study aimed to investigate the inhibition of vascular endothelial growth factor (VEGF) by small hairpin RNA (shRNA) interference combined with radiotherapy on the growth of cervical cancer SiHa cell xenografts in nude mice. The effective pVEGF-shRNA plasmid was screened by reverse transcription-polymerase chain reaction (RT-PCR), and the cell apoptosis rate was estimated by flow cytometry. A nude mouse cervical xenograft model was established and all models were divided into four groups: blank control, VEGF shRNA, radiotherapy, and combined treatment. We calculated the tumor growth curve and the inhibitory rate. The histopathological changes of the microvascular density and VEGF protein expression were observed by immunohistochemistry. The expressions of VEGF and hypoxia inducible factor-1α (HIF-1α) proteins in the tumor tissue were analyzed via Western blot. VEGF shRNA interference inhibited the expression of radiation-induced VEGF (P < 0.05), induced apoptosis (P < 0.05), downregulated the HIF-1α protein, and reduced angiogenesis.
Compared with the other three groups, the combined treatment group showed the most significant effects (P < 0.01). VEGF shRNA interference combined with radiotherapy promotes the radiosensitivity of tumors via improvement of the hypoxic microenvironment.

**Key words:** Cervical cancer; Vascular endothelial growth factor; SiHa cells; RNA interference; Radiosensitivity