Induction function of siRNA-mediated survivin gene silencing on nasopharyngeal carcinoma cell apoptosis


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ABSTRACT. We examined the function of survivin gene expression in patients with nasopharyngeal carcinoma (NPC), as well as small interfering RNA (siRNA) on controlling CNE-2 NPC proliferation and apoptosis. Immunohistological methods, in situ hybridization, and reverse transcription-polymerase chain reaction technique were used to detect survivin protein and mRNA expression. We designed an siRNA sequence to inhibit survivin gene expression. The MTT method was used to examine the function of siRNA on controlling cell growth and proliferation. Induction of cell apoptosis by siRNA was examined by flow cytometry; electron microscopy was used to observe ultrastructure changes in CNE-2 cells. Western blotting was used to detect survivin gene expression. The survivin protein was expressed in 71.9% of cells, while its mRNA was expressed in 65.6% of cells. Relative mRNA expression was $4.16 \times 10^{-2}$; these data for the control groups were 23.3, 33.3, and $4.42 \times 10^{-4}$, respectively. Following transfection with 3 different siRNA sequences, survivin mRNA expression in CNE-2 cells was decreased. Inhibition of cell proliferation and rate of apoptosis increased with
increasing siRNA concentration. Western blotting revealed decreased survivin expression and electron microscopy revealed ultrastructural changes in cancer cells. Survivin gene expression in NPC generally increased. In vitro transcription of siRNA decreased CNE-2 survivin gene expression, and different sequences of siRNA decrease gene expression in CNE-2 cells to varying degrees. Transfected siRNA3 can effectively inhibit CNE-2 cell proliferation and induce apoptosis; gene silencing using siRNA may represent a new treatment for NPC.

Key words: Gene silencing; Nasopharyngeal carcinoma; siRNA; Survivin