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Effect of overexpression of *PTEN* on apoptosis of liver cancer cells

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ABSTRACT. Liver cancer is a common malignant tumor associated with a short-survival period and high-mortality rate, and its prevalence in China is particularly high. This study aimed to investigate the effect of overexpressing the phosphatase and tensin homolog deleted on chromosome 10 (*PTEN*) gene on liver cancer cell apoptosis and provide new insight into the treatment of this disease. The experimental design included four treatment groups, consisting of HHCC and H22 cells transfected with *PTEN* recombinant plasmids (HHCC+PTEN, H22+PTEN), and those transfected with control plasmids (HHCC+NC, H22+NC). The expression of *PTEN* mRNA was determined by quantitative polymerase chain reaction, and protein levels were examined by western blot. Cell apoptosis was measured using flow cytometry and terminal deoxynucleotidyl transferase-mediated deoxyuridine triphosphate nick-end labeling. *PTEN* mRNA expression

in cells transfected with pcDNA3.1-PTEN was significantly increased compared to the control groups ($P < 0.05$). In addition, western blotting revealed PTEN protein expression in the treatment groups to be significantly elevated in comparison to control cells ($P < 0.05$). Flow cytometry showed that apoptosis rates of both HHCC+PTEN (approximately 21.9%) and H22+PTEN (approximately 41.0%) cells were significantly higher than those of the control groups ($P < 0.05$). Moreover, the difference in apoptosis rate between experimental and control groups was significant ($P < 0.05$). In this study, HHCC and H22 cells were successfully transfected with pcDNA3.1-PTEN *in vitro*. We conclude that overexpression of *PTEN* can effectively inhibit proliferation of these cells and promote their apoptosis.

Key words: *PTEN*; Transfection; Liver cancer; Apoptosis

