Effect of Bcl-2-siRNA on proliferation and apoptosis of pediatric acute B lymphoblastic leukemia (A-BLL) cells

W.B. Meng1, J.P. Liu2, X.W. Wang2 and L.H. E3

1Department of Obstetrics and Gynecology,
Affiliated Hospital of Inner Mongolia Medical University, Hohhot, China
2Department of Pediatric Hematology,
Inner Mongolia People's Hospital, Hohhot, China
3Department of Stomatology,
Affiliated Hospital of Inner Mongolia Medical University, Hohhot, China

Corresponding authors: W.B. Meng / L.H. E
E-mail: 349881704@qq.com / wangxwdph@yeah.net

Received May 3, 2015
Accepted July 29, 2015
Published October 16, 2015
DOI http://dx.doi.org/10.4238/2015.October.16.9

ABSTRACT. This study analyzed the effect of small interfering RNA specific for the Bcl-2 gene (siRNA Bcl-2) on the proliferation and chemotherapeutic sensitivity of pediatric A-BLL cells. Marrow samples were obtained from sixty newly-diagnosed A-BLL pediatric patients. The Bcl-2 mRNA expression in these samples was quantified by real time polymerase chain reaction. The Bcl-2 mRNA re-expression was analyzed by RNA interference using Bcl-2-siRNA. Cellular proliferation was detected using the MTT (Thiazolyl Blue Tetrazolium Bromide) assay. The cell apoptosis was quantified by flow cytometry. The Bcl-2 mRNA expression was significantly higher in the drug-resistance group than in the chemotherapy sensitivity group prior to chemotherapy (P < 0.05). In addition, the Bcl-2 mRNA expression in the chemotherapy sensitivity group was significantly higher before chemotherapy than that after chemotherapy (P < 0.05). The Bcl-2 mRNA expression significantly decreased in the leukemic cells of the Bcl-2-siRNA
transfection group. We observed statistically significant differences in the relative mRNA expression levels among the Bcl-2-siRNA transfection, blank control, liposome empty transfection, and unrelated sequence oligonucleotide groups (P < 0.05). The rate of apoptosis in pediatric A-BLL leukemic cells was observed to increase significantly after transfection with Bcl-2-siRNA compared to the control, liposome empty transfection, and unrelated sequence oligonucleotide groups (P < 0.05). Therefore, we concluded that Bcl-2-siRNA can successfully inhibit the multiplicative capacity of A-BLL leukemic cells and promote apoptosis.

**Key words:** Bcl-2-siRNA gene; Cell proliferation; Cell apoptosis; Pediatric acute B lymphocytic leukemia