Summary

Apoptosis is a complex, strictly regulated physiological process which is characterized by several molecular and biochemical features such as upregulation of proapoptotic genes, activation of specific enzymes, cell contraction and rounding, formation of spikes and blebs, DNA fragmentation and cell fragmentation into apoptotic bodies.

The aim of this work was to investigate changes in expression of apoptosis related genes in cells of two cell lines after treatment with etoposide.

To find out about changes in genes expression of apoptosis-related genes, two stabilized cell lines Hep-2 and HL-60 were treated with etoposide, a topoisomerase II inhibitor, during 0 h, 6 h or 12 h. The changes in genes expression of TP53, BCL2, BAX and DFFB were measured by quantitative real-time RT-PCR.

In Hep-2 cells, the relative expression level of TP53 gene was significantly higher after 6 h of treatment then the untreated control. Expression of TP53 was significantly higher also after 12 h of treatment compares to control, but lower than the group of cells treated 6 h. HL-60 is the TP53-negative cell line.

In Hep-2 cells, the relative expression level of BCL2 gene was significantly higher after 6 h of treatment than the untreated control. The relative expression level of BCL2 was significantly higher also after 12 h of treatment and the expression level also significantly increased between 6 h and 12 h of treatment with etoposide. Whereas, the relative expression level of BAX did not significantly change neither after 6 h nor 12 h of treatment with etoposide.

In HL-60 cells, the relative expression level of BCL2 gene was significantly lower after 6 h of treatment than the untreated control, but the expression level was significantly higher after 12 h of treatment compared to untreated control. The significant distinction was also between 6 h and 12 h of treatment with etoposide. The relative expression level of BAX gene was significantly higher after 6 h and 12 h of treatment with etoposide compare to untreated control.

In Hep-2 cells the expression level of DFFB was significantly lower after 12 h of treatment compares to the group of cells treated 6 h. In HL-60 cells the expression level of DFFB did not change.

Quantitative analysis of these genes shows the different expression levels especially of BCL2 and BAX genes in Hep-2 and HL-60 cells. It can indicate the different response of Hep-2 and HL-60 cells to etoposide treatment.