Effects of Andrographolide on HO-1 gene expression in mesenchymal stem cell isolated from rat bone marrow

Abstract

Backround and Objective:

Previous studies have shown that the survival rate of Mesenchymal Stem Cells (MSCs) is often reduced by oxidative stress, free radicals, hypoxia, and serum deprivation. Hence, this study aimed to find out whether pre induction of HO-1 mRNA expression using Andrographolide would affect the viability of MSCs after exposure to oxidative stress and serum deprivation or not.

Methods:

Mesenchymal stem cells from bone marrow were cultured. Cells from the passage four were treated with (2/5, 5,7/5,10) μM concentrations of andrographolide. Then, the treated cells were exposed to 360 μM H2O2 and serum deprivation. The percentage of survived cells was analyzed by the MTT assay. In addition HO-1 mRNA expression in MSCs was evaluated using quantitativereal-time PCR.

Results:

The findings of the study indicated that pretreating MSCs with Andrographolide leads to increased survival rate and resistance to cellular stress origination from H2O2 and serum deprivation. In addition, the result of Real time PCR showed that gene expression of HO-1 increased in the treatment group in comparison to the control group ($p<0.05$).

Conclusion

This study demonstrates that andrographolide may enhanc the therapeutic effectiveness of MSCs, by stimulating the production of heme oxygenase 1. This may provide a novel strategy to promote the efficiency of cell therapies following transplantation in the future

Keywords: mesenchymal stem cells,andrographolide,hemeoxygenase1