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TITLE: The Synergistic Effects of Cold Atmospheric Plasma and Plasma-assisted extracted Silibinin

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Abstract

Considering the effectiveness of the milk thistle extract on MCF-7 breast cancer cells and its availability as well as its low price, we decided to study the synergistic effects of the cold atmospheric pressure plasma (CAP) and this extract against breast cancer cells. In this study, we showed that the combination of cold atmospheric plasma (CAP) and silibinin extraction result in additive tumor cell killing in vitro in human breast cancer cells. The origin of this synergy effect figured out by evaluating the half maximal inhibitory concentration (IC50), MTT assay, reactive oxygen species, and quantitative real-time PCR. Comparing the synergistic effect, and the silibinin effect on breast cancer, MCF-7 cells were cultured in the presence of different concentrations of the plasma-activated-silibinin. Use has been made of MTT assay and quantitative real-time PCR to assess the effect of this kind of treatment on cell viability and the expression levels of mRNA and also the protein of Bax and Bcl-2 genes. It was figured out that, Reactive oxygen species raise additively as a result of combining CAP with silibinin. Using MTT assay, it was shown that the plasma activated silibinin reduced the viability of MCF-7 cells more rapidly than silibinin alone (almost twice faster), on the other hand reduced the migration of cells. It was also shown that plasma-activated-silibinin increased the levels of Bax mRNA expression, significantly. Besides, the amount of Bcl-2 gene expression (which was not affected by silibinin alone) is affected by plasma activated silibinin. Real-time analysis showed that the synergistic effect of CAP and silibinin changed the BAX/BCL-2 ratio in favor of apoptosis.

The results of this study verify the influence of plasma-activated-silibinin on breast cancer. Therefore, the combination of cap and milk thistle could be influential in breast cancer therapy.

Biography

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References

1. Wenzel, S., Stolte, H., & Soose, M. (1996). Effects of silibinin and antioxidants on high glucose-induced alterations of fibronectin turnover in human mesangial cell cultures. *Journal of Pharmacology and Experimental Therapeutics*, *279*(3), 1520-1526.

2. Tyagi, A. K., Singh, R. P., Agarwal, C., Chan, D. C., & Agarwal, R. (2002). Silibinin strongly synergizes human prostate carcinoma DU145 cells to doxorubicin-induced growth Inhibition, G2-M arrest, and apoptosis. *Clinical cancer research*, *8*(11), 3512-3519.
3. Schönfeld, J. V., Weisbrod, B., & Müller, M. K. (1997). Silibinin, a plant extract with antioxidant and membrane stabilizing properties, protects exocrine pancreas from cyclosporin A toxicity. *Cellular and Molecular Life Sciences CMLS*, *53*(11-12), 917-920.
4. Fintelmann, V. (1991). Modern phytotherapy and its uses in gastrointestinal conditions. *Planta medica*, *57*(S 1), S48-S52.
5. Bhatia, N., Zhao, J., Wolf, D. M., & Agarwal, R. (1999). Inhibition of human carcinoma cell growth and DNA synthesis by silibinin, an active constituent of milk thistle: comparison with silymarin. *Cancer letters*, *147*(1-2), 77-84

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