Combining anticancer effect of Allicin and Methylsulfonylmethane on the survival of the breast cancer cell line (MCF7)

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Abstract:

Introduction & Objective: Allicin is the most important component of garlic and is one of organosulfur compounds that is effective in apoptosis induction and cell death in various tumor cell lines, according to the previous investigations. Methylsulfonylmethane is non-toxic to the human body that its effect on several cancer lines has been studied. The combination of these two compounds is considered in this study for the first time in order to investigate its synergistic effects on breast cancer cell lines (MCF7).

Material & Methods: In this study, breast cancer cell lines were cultured in RPMI-1640 and were separated in terms of having or not having marker 44CD. Then, the effect of different concentrations of allicin and its combination with methylsulfonylmethane was investigated on these cells using MTT, clonogenic assay and Acridine orange/Ethidium bromide stain, flowcytometry and reverse transcriptase pcr methods.

Results: The results showed that Allicin has high impact on breast cancer cell death on its own, but, Allicin combination with methylsulfonylmethane increased the number of apoptotic cells compared to the other groups. Cell Group sensitivity of cd44- was higher compared to the cd44+. Flowcytometry results showed that allicine and MSM caused cell cycle arrest in G0-G1 phase. RT-PCR results showed that allicine and MSM combination caused change in P53, cyclin-D1, Bax, BCL-2, and Caspase-3 gene expression.

Conclusion: Concomitant use of low concentrations of allicin with methylsulfonylmethane, can be effective in the treatment of breast cancer cells by increasing the number of apoptotic cells.

Keywords: allicin / methylsulfonylmethane / CD44± / Breast Cancer / Apoptosis / MTT / Clonogenic assay / RT-PCR