GARLIC EXTRACT-INDUCED PHOSPHATIDYLSERINE EXTERNALIZATION INDEPENDENT OF OXIDATIVE STRESS IN HUMAN LEUKEMIA (HL-60) CELLS

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Abstract: Garlic supplementation in diet has been shown to benefit patients with leukemia. However, the mechanisms by which water soluble garlic extract-induced oxidative stress and apoptosis in cancer cell remain largely unknown. In this research, we hypothesized that oxidative stress may play a key role in water soluble garlic extract-induced apoptosis of HL-60 cells. To test this hypothesis, we performed lipid peroxidation assay and flow cytometric analysis, respectively. Human leukemia (HL-60) cells were treated with different doses of water soluble garlic extract for 12 h. We detected a significant increase in lipid peroxidation (malondialdehyde) concentrations in water soluble garlic extract-treated HL-60 cells compared to the control. The flow cytometric assessment (Annexin V) showed a strong dose-response relationship between water soluble garlic extract exposure and annexin V positive cells as evidence that garlic exposure causing apoptosis of HL-60 cells. Upon 12 hrs of exposure, the results of annexin V/PI staining showed that the percentages of HL-60 cells undergone early stage apoptotic were 5 ± 0%, 13 ± 0.7%, 17 ± 5.7%, 22 ± 4.6, and 18 ± 0% in 0, 2, 4, 6, and 8 mM of water soluble garlic extract, respectively. Taken together, this experiment demonstrates that water soluble garlic extract represents an apoptosis-inducing agent in HL-60 promyelocytic leukemia cells. The apoptosis of HL-60 cells caused by water soluble garlic extract exposure was found to be mediated through the formation of malondialdehyde, a biomarker of oxidative stress.

Key words: Water soluble garlic extract, HL-60 cells, annexin V, flow cytometry

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