CYTOGENOTOXIC EFFECT OF VITAMIN C TO HUMAN LEUKEMIA CELLS: IMPLICATION IN LEUKEMIA PREVENTION

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Abstract: Numerous epidemiological studies have demonstrated that ascorbic acid supplementation helps to prevent various types of cancer including bladder, breast, cervical, colorectal, esophageal, lung, pancreatic, prostate, salivary gland, stomach, leukemia, and non-Hodgkin's lymphoma. It reverses the biological clock by rejuvenating white blood cells in the elderly. The aim of the present investigation was to evaluate the potential benefit of ascorbic acid in the prevention and/or treatment of leukemia. To achieve this goal, MTT assay was performed for cell viability. Propidium iodine assay and trypan blue exclusion test using the cellometer were also performed for cell viability, respectively. Comet assay was conducted to estimate the degree of DNA damage. The result of MTT assay indicated that high doses of ascorbic acid induced cellular toxicity to HL-60 cells in a dose-dependent manner. Similar trend was obtained with propidium iodine assay and trypan blue exclusion test using the cellometer vision. We observed a not statistical significant differences ($P>0.05$) in comet tail-length, tail arm, tail moment, and percentages of DNA cleavage between ascorbic acid-treated cells and the control. Together, data generated from the present study indicates on one hand that high doses of ascorbic acid induce cytotoxic effects on HL-60 cells. On the other hand, high doses of ascorbic acid do not induce genotoxic effects on HL-60 cells, probably due to its antioxidant property.

Key Words: Ascorbic acid, HL-60 cells, toxicity, DNA damage, cellometer vision

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