

Cytotoxic effects of commercial wheatgrass and fiber towards human acute promyelocytic leukemia cells (HL60).

ABSTRACT

Cytotoxicity, the possible selective activity upon HL60 as well as the anti-proliferation effect of local health supplement wheatgrass and mixture of fibers were investigated in vitro using various cancerous cell line and normal blood cell culture. The IC(50) of wheatgrass-treated HL60 (17.5 ± 1.1 , 12.5 ± 0.3 , and 16 ± 0.5 microgram/ml for 24, 48 and 72 h, respectively) and fibers-treated HL60 (86.0 ± 5.5 , 35.0 ± 2.5 , and 52.5 ± 4.5 microgram/ml for 24, 48 and 72 h, respectively) showed that both extracts possessed optimum effect after 48 hours of treatment. No significant cytotoxic effect was observed on other type of cells. For trypan blue dye exclusion method, wheatgrass reduced the number of viable cells by 13.5% (± 1.5), 47.1% (± 3.6), and 64.9% (± 2.7) after 24, 48 and 72 h exposure, respectively. Mixture of fibers reduced the number of viable cells by 36.4% (± 2.3), 57.1% (± 3.1), and 89.0% (± 3.4) after 24, 48 and 72 h exposure, respectively, indicated that necrosis is also an alternative to the apoptotic mechanism of cell death. Annexin-V/propidium iodide staining revealed that both extracts induced apoptosis where early apoptosis had been detected concurrently with the reduction of percentage of cell viability. Cell cycle analysis revealed that in HL60, the percentage of apoptosis increased with time (wheatgrass: $16.0\% \pm 2.4$, $45.3\% \pm 3.4$ and $39.6\% \pm 4.1$; mixture of fibers: $14.6\% \pm 1.8$, $45.4\% \pm 2.3$ and $45.9\% \pm 1.2$) after exposure for 24, 48 and 72 h, respectively at the concentration of 100 microgram/ml and showed optimum effect at 48 hours. Thus, these health products can be a potential alternative supplement for leukaemia patients.

Keyword: Cytotoxicity; HL60; Fiber; Wheatgrass.