**ABSTRACT**

The effect of Ara-C, AA and their combinations was studied by using in vitro models such as MTT assay, trypan blue exclusion assay, determination of influence of caspase-3-inhibitor III, clonogenic assay and DNA fragmentation assay on HL-60 cell line. The study was also done by using in vivo models such as measurement of peritoneal fluid, packed cell volume, estimation of reduced glutathione, nitric oxide, LDH, and hematological parameters like total leukocyte count, platelet count, hemoglobin estimation on DLA induced mice.

Ara-C (50, 100 and 150 ng/ml) and AA (0.25, 0.50 and 0.75mM) alone and their combinations produced extremely significant (P<0.001) dose and time dependent decrease in percentage cell viability on HL-60 cell line as compared to control in MTT and Trypan blue exclusion assay and extremely significant (P˂0.001) decrease in percentage colony growth

In determination of influence of caspase-3 inhibitor III assay, the percentage cell viability of HL-60 cell line was increased more than control on treatment with Ara-C, AA and their combinations. The increase in percentage cell viability with AA was dose dependent; as the dose of AA was increased, the cell viability was also increased. The mechanisms for dose dependent increase in cell viability are unknown and thus needs further investigation. Ara-C, AA alone and in combinations caused DNA fragmentation in dose dependent manner. This indicated that Ara-C, AA alone and in combinations involves the mechanism of DNA fragmentation and caspase-3 enzyme activation

**Keywords:** MTT assay, Dalton lymphoma, caspase-3-inhibitor III, DNA fragmentation assay, hematological parameters, cancer mice, anticancer