Evaluation of the cytotoxic and genotoxic effects of goniothalamin in leukemic cell lines

ABSTRACT

The cytotoxic and genotoxic effects of goniothalamin, a plant styrllactone, were evaluated using the 3-(4,5-dimethyl-2-thiazolyl)-2,5-diphenyl-2H-tetrazolium bromide (MTT) assay and the Alkaline Comet assay respectively in human leukemic cell lines. Following 72 h of treatment, the IC50 values of goniothalamin in human HL-60 promyelocytic leukemia cells and CEM-SS T-lymphoblastic cells were 4.5 μg/mL and 2.4 μg/mL respectively. The genotoxicity of goniothalamin in both HL-60 and CEM-SS cells was detected as early as 2 h following treatment at IC10 and IC25 concentrations. However, pretreatment with the antioxidant N-acetyl-cysteine (NAC) at 1 mM for 30 minutes did not abrogate genotoxicity of this compound. This result suggests that primary induction of DNA damage by goniothalamin may not involve oxidative damage. In conclusion, our results demonstrate genotoxic damage induced by goniothalamin in leukemic cells. Further studies are needed to ascertain the mode of action of goniothalamin in inducing DNA damage.

Keyword: Cytotoxicity; Genotoxicity; Alkaline Comet Assay; Leukemic cell lines