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Boric acid enhances in vivo Ehrlich ascites carcinoma cell proliferation in Swiss albino mice

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Abstract

The influence of boric acid, a boron carrier, on Ehrlich ascites carcinoma (EAC) cell-bearing mice was investigated in view of its importance in the boron neutron capture therapy and the influence of boron on proliferation and progression of cancer cells mediated by proteoglycans and collagen. The present study included the evaluation of boric acid for the effects on total count and viability of EAC cells in addition to their non-protein sulfhydryls (NP-SH) and malondialdehyde (MDA) contents as parameters for conjugative detoxication potency and possible oxidative damage. The EAC cell-bearing animals were also observed for the effect on survival, body weight changes, and histopathological evaluation of the tumors grown at the site of inoculation. The treatment with boric acid significantly increased the total number of peritoneal EAC cells and their viability. A significant increase in the body weight was observed that dose-dependently reached plateau levels by 20 days of treatment. Conversely, a reduction in the duration of survival of these animals was evident with the same protocol. Boric acid treatment resulted in a decrease in NP-SH contents with a concomitant increase in MDA levels in EAC cells as revealed by the results of the biochemical analysis. These data are supported by our results on histopathological investigations, which apparently showed fast growth, in addition to several mitotic figures and mixed inflammatory reaction, after treatment with boric acid. It seems likely that a particular combination of properties of boric acid, rather than a single characteristic alone, will provide useful information on the use of this boron carrier in neutron capture therapy.

Keywords: Boric acid; Ehrlich ascites carcinoma; Proliferation; Sulfhydryls; Malondialdehyde; Histopathology