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Antineoplastic activity of honey in an experimental bladder cancer implantation model

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Abstract

Objectives:

The anti-tumor effect of bee honey against bladder cancer was examined *in vitro* and *in vivo*.

Methods:

Three human bladder cancer cell lines (T24, 253J and RT4) and one murine bladder cancer cell line (MBT-2) were used in these experiments.

In an *in vitro* study, the antitumor activity was assessed by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay, TdT-mediated dUTP-biotin nick end labeling (TUNEL) assay, 5-Bromodeoxyuridine (BrdU) labeling index and flowcytometry (FCM).

In the *in vivo* study, cancer cells were implanted subcutaneously in the abdomens of mice, and the effects were assessed by the tumor growth.

Results:

In vitro studies revealed significant inhibition of the proliferation of T24 and MBT-2 cell lines by 1–25% honey and of RT4 and 253J cell lines by 6–25% honey.

BrdU labeling index was significantly lower. FCM showed lower S-phase fraction, as well as absence of aneuploidy compared with control cells. In the *in vivo* studies, intralesional injection of 6 and 12% honey as well as oral ingestion of honey significantly inhibited tumor growth.

Conclusion:

Bee honey is an effective agent for inhibiting the growth of T24, RT4, 253J and MBT-2 bladder cancer cell lines *in vitro*. It is also effective when administered intralesionally or orally in the MBT-2 bladder cancer implantation models.

Our results are promising, and further research is needed to clarify the mechanisms of the antitumor activity of honey.

This article is cited by:

Nada Oršolić, Svjetlana Terzić, Lidija Šver, Ivan Bašić. (2005) Honey-bee products in prevention and/or therapy of murine transplantable tumours. *Journal of the Science of Food and Agriculture* **85**:3, 363