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.

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