THE CHEMOPREVENTIVE POTENTIAL OF CURCUMA PURPURASCENS RHIZOME IN REDUCING AZOXYMETHANE-INDUCED ABERRANT CRYPT FOCI IN RATS

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Background: Curcuma purpurascens rhizome, a member of the Zingiberaceae family, is a popular spice in Indonesia and is traditionally used for assorted remedies. Dichloromethane extract of C. purpurascens rhizome (DECPR) has previously been shown to have apoptosis-inducing effect on colon cancer cells.

Methods: We examined the potential of DECPR to prevent colon cancer development in rats treated with azoxymethane (AOM, 15 ml/kg) by the incidence of aberrant crypt foci (ACF). Starting from the day immediately after AOM treatment, the rats were orally administered once a day for 2 months with 10% Tween-20 (5 ml/kg, cancer control), DECPR (250 mg/kg, low dose) and DECPR (500 mg/kg, high dose). Meanwhile, the control group was intra-peritoneally injected with fluorouracil (35 mg/kg) for 5 days consecutively. After euthanising the rats, the number of ACF was enumerated in colon tissues. Bax, Bcl-2, and PCNA protein levels were examined using immunohistochemical and western blot analyses. Antioxidant enzymatic activity was measured in colon tissue homogenates and associated with malondialdehyde level.

Findings: DECPR exposure at both doses significantly decreased AOM-induced ACF formation, which was accompanied with the reduced expression of PCNA. Up-regulation of Bax and down-regulation of Bcl-2 suggested the involvement of apoptosis in the chemopreventive effect of DECPR. In addition, the oxidative stress resulting from AOM treatment was significantly attenuated after administration of DECPR, which was shown by the elevated antioxidant enzymatic activity and reduced malondialdehyde level.

Interpretation: DECPR significantly inhibits ACF formation in AOM-treated rats and may offer protection against colon cancer development.

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