INHIBITORY EFFECT OF CURCUMIN ON TUMORIGENESIS IN MICE

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The powdered dry rhizome of the plant *Curcuma longa* Linn. (turmeric) has long been used as naturally occurring medicine for the treatment of inflammatory diseases. Curcumin (diferuloylmethane), the yellow pigment in turmeric, curry, and mustard, is the major antioxidant and anti-inflammatory substance in turmeric. Commercial grade curcumin (turmeric type 97; curcumin) contains approximately 77% curcumin, 17% demethoxycurcumin and 3% bisdemethoxycurcumin.

Topical application curcumin to the backs of CD-l mice inhibited covalent binding of benzo(a)pyrene (B(a)P) to epidermal DNA and inhibited skin tumor initiation by B(a)P and 7,12-dimethylbenz[a]anthracene (DMBA). Application of curcumin, demethoxycurcumin and bisdemethoxycrucumin also inhibited TPA-induced ornithine decarboxylase, TPA induced hyperplacia, and TPA-induced tumor promotion in CD-l mice.

Oral administration of curcumin in diet inhibited (B[a]P)-induced forestomach tumorigenesis in A/J mice, N-ethyl-N'-nitro N-nitrosoguanidine (ENNG)-induced duodenal tumorigenesis in C57BL/6 mice, and azoxymethane (AOM)-induced colon tumorigenesis in CF-1 mice. Feeding 0.5-2.0% curcumin in the diet decreased the number of B[a]P-induced forestomach tumor per mouse by 51-53% when administrated during the initiation period and 47-67% when administrated during the post initiation period. Administration of 0.5 - 4.0 % curcumin in the diet during both the initiation and postinitiation period decreased the number of AOM-induced colon tumors per mouse by 51-62%. Administration of 2% curcumin n the diet inhibited the number of AOM-induced colon tumors per mouse by 66% when fed during the initiation period and 25% when fed during the post initiation.

The ability if commercial grade curcumin to inhibit AOM-induced colon tumorigenesis is comparable to that of pure curcumin (purity greater than 98%). Administrations of curcumin in the diet to AOM-treated mice result in development of colon tumors which were generally smaller in number and size as compared to the control group of AOM-treated mice. These results indicate that not only did curcumin inhibit the number of tumors per mouse and the percentage of mice with tumors but also reduced tumor size. Histopathological examination of the tumors showed that dietary curcumin inhibited the number of papillomas and squamous cell carcinomas of forestomach as well as the number of adenomas and adenocarcinomas of duodenum and colon (Supported by NIH grant CA 49756).