

Low level of Cyclooxygenase-2 transcript in the spleen of lymphoma rats supplemented with garlic powder

ABSTRACT

Cyclooxygenases (COXs) regulate tumor cell proliferation and metastasis in many types of cancers including hematological cancers. Organosulfurs derived from garlic have a potential to inhibit the expression of COX-2 in cancer patients. Objective: In this study, we evaluate the transcription levels of COX-2 in the spleen of lymphoma rats supplemented with garlic powder. Methods: Three groups of rats were equally divided into control (n=3), lymphoma (n=3), and lymphoma supplemented with garlic powder (n=3) groups. Lymphoma was induced via administration of N-methyl-N-nitrosourea (MNU) intraperitoneally 4 times in 2 week periods. Garlic powder mixed with ground commercial rat diet was given daily at 5% of feed intake, starting at day 1 of MNU exposure. All rats were kept for 24 weeks before spleen samples were collected and extracted for total RNA. The transcription levels of COX-2 transcript in the total RNA were determined using quantitative real-time reverse transcriptase polymerase chain reaction assay. The total RNA was converted into cDNA followed by amplification of COX-2 and beta-actin genes. Results: Results of the amplification of COX-2 transcripts were normalized with the housekeeping gene, beta-actin. The relative transcription level of COX-2 transcript in the spleen of lymphoma rats was 1.941 ± 0.131 fold higher ($p < 0.05$) than control rats (1.00 ± 0.001 fold), while the transcription levels in the spleen of lymphoma rats supplemented with garlic was significantly lower (0.423 ± 0.239 SE fold) than the lymphoma rats that received no supplementation of garlic powder. Conclusion: The findings suggest that garlic powder reduces the transcription of COX-2 transcript in the spleen of lymphoma rats.

Keyword: Garlic; Cyclooxygenase-2; N-methyl-N-nitrosourea; Splenic lymphoma; Real-time reverse transcriptase polymerase chain reaction assay