

Effect of garlic on micronuclei frequency in peripheral blood lymphocytes of rats with N-methyl-N'-nitro-N-nitrosoguanidine-induced gastric carcinoma and precancerous lesions

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Author contributions: All authors contributed equally to the work.

Original title: *China National Journal of New Gastroenterology* (1995-1997) renamed *World Journal of Gastroenterology* (1998-).

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Received: March 13, 1997

Revised: April 22, 1997

Accepted: June 18, 1997

Published online: December 15, 1997

Abstract

AIM: To investigate the effects of garlic on micronuclei frequency (MNF) in peripheral blood lymphocytes (PBLs) of Wistar rats with N-methyl-N'-nitro-N-nitrosoguanidine (MNNG)-induced gastric carcinoma (GC) and precancerous lesions (PLs).

METHODS: Wistar rats were exposed to MNNG at 1.25 mg/5 mL per day for 10 mo to induce GC and PLs (MNNG group, $n = 30$); rats not exposed to MNNG served as unmodeled controls (control group, $n = 16$). The MNNG rats were randomly divided into a prevention treatment group ($n = 30$; receiving 10 mL of a 10% garlic solution per day) and an untreated model control group ($n = 20$; receiving tap water). MNF in PBLs were detected at experiment months 10 and

16 mo by the microculture technique.

RESULTS: The MNNG group had similar MNF levels at months 10 and 16. Compared to the control group, the MNNG, prevention and untreated model control groups had remarkably higher MNF levels ($P < 0.01$). The level of PLs was significantly lower in the prevention treatment group than in the untreated model control group ($P < 0.01$). The prevention group showed significantly lower MNF than the MNNG group ($P < 0.01$), and the MNF level was reduced in month 16 compared to month 10 ($P < 0.01$). However, the difference in MNF levels in groups given prevention or treatment was not significant.

CONCLUSION: MNNG exposure exerted continuous mutagenicity and carcinogenicity properties on PBLs, and garlic exerted a remarkable anti-mutagenic and anti-carcinogenic effect. MNF in PBL may be a novel marker of early-stage GC.

Key words: Garlic/Pharmacology; Stomach neoplasms/zhongyi-yaoliaofa; Adenocarcinoma/Zhongyiyao liaofa; Precancerous conditions/zhongyiyao liaofa; Lymphocytes/Drug effects; Micronuclei/Drug effects

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Su Q, Luo ZY, Ou YG, Li YQ, Zhou JG, Zhang D. Effect of garlic on micronuclei frequency in peripheral blood lymphocytes of rats with N-methyl-N'-nitro-N-nitrosoguanidine-induced gastric carcinoma and precancerous lesions. *World J Gastroenterol* 1997; 3(4): 237 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v3/i4/237.htm> DOI: <http://dx.doi.org/10.3748/wjg.v3.i4.237>

S- Editor: A L- Editor: Filipodia E- Editor: Li RF



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ISSN 1007 - 9327

