ONLINE ISSN : 1880-313X
PRINT ISSN : 0388-6107

Biomedical Research
Vol. 25 (2004) , No. 5 October pp.229-235

Effects of granisetron and vagotomy on c-fos mRNA expression in the rat medulla oblongata as assessed by *in situ* hybridization

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(Received August 2, 2004)
(Accepted September 14, 2004)

ABSTRACT

Cancer chemotherapy-induced nausea and vomiting have been demonstrated to involve humoral as well as neuronal mechanisms. A leading role of serotonin (5-hydroxytryptamine, 5-HT) in these mechanisms is supported by inhibition of the emesis by 5-HT_3 receptor antagonists. We compared the effects of granisetron, a selective 5-HT_3 receptor antagonist, and vagotomy on c-fos mRNA expression in the nucleus of the solitary tract (NTS) and the area postrema (AP) of the rat caudal brainstem by means of *in situ* hybridization. The expression of c-fos mRNA in the NTS and AP was significantly elevated 2 h after cisplatin administration. The induction of c-fos expression by cisplatin in the NTS was significantly inhibited by pretreatment with granisetron. In contrast, the c-fos expression in the AP did not differ between the cisplatin group and the granisetron-treated cisplatin group. The degree of the induction of c-fos mRNA expression in both the AP and NTS was similar between the vagotomy and sham operation groups. Our results suggest that the expression of c-fos mRNA in the NTS may be specifically controlled by 5-HT_3 receptors and that nonspecific humoral factors, such as modulation of transcriptional activity, play an important role in c-fos expression in the AP after vagotomy.

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doi:10.2220/biomedres.25.229

JOI JST.JSTAGE/biomedres/25.229
