Effects of Chronic Gastroduodenal Reflux on Gastric Mucosal Ornithine Decarboxylase Activities

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Patients undergoing gastric surgery for benign disease have a markedly increased risk of gastric carcinoma, related to the original pathology and type of operation performed. [Caygill et al, Lancet 1986;ii:929-931]. Although the mechanisms responsible are unknown, increased polyamine concentrations have been found in human gastric cancer [Lundell et al, Scand J Gastroent 1986;21:829-832]. We, therefore, measured ornithine decarboxylase activities and polyamine concentrations in gastric mucosa from gas-trojejunostomised rats, a model previously associated with carcinoma development [Mason RC, Brit J Surg 1986;73:801-823].

Study Design and Methods: Polyamine concentrations [Seder and Knodgen, J Chromat 1980;221:227-235] and ornithine decarboxylase activities [Lapointe and Cohen, Anal Biochem 1980;109:291-294] were measured in gastric mucosal tissue, adjacent to the scar, in two groups of rats, Group A, which had undergone gastrotomy, and Group B which had received a gastrojejunostomy. Samples were taken at 8-week intervals following the operation.

Results: In Group A ODC activities showed little change with time and at 16, 48 and 56 weeks were significantly less than those in Group B (table). Significantly raised concentrations of putrescine were found at 24 and 48 weeks in Group B. No significant differences in spermine and spermidine concentrations were found at any time interval between Groups A and B.

Conclusion: If ODC activity and putrescine concentration reflect increased tissue proliferation then carcinomas could be expected to occur after 24 weeks in this model.

Weeks 8	16	24
32	40	48
		56

ODC1 A	207(8)	205(11)	241(9)
B	252 (4)	264 (10)*	341 (7)
Putres2 A	0.5(5)	0.6(6)	0.3(6)
B	0.4(5)	0.5(7)	0.6(6)*
244(11)	244(11)	222(10)	147(7)
319(2)	275(7)	361(10)*	252(7)*
0.3(7)	0.5(5)	0.5(6)	0.3(3)

0.5(2) 0.7(6) 1.0(7)*0.7(6)

1 pmol/h/mg prot.; 2 ng/mg prot.; * $p < 0.05$; numbers of animals in parentheses.