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Determination of lipid peroxide and superoxide dismutase in blood and tissue of patients with gastrointestinal cancer

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Abstract

AIM: To study the relationship between the lipid peroxide (LPO) and superoxide dismutase (SOD) and the pathogenesis of gastrointestinal cancers.

METHODS: We investigated the SOD activity and LPO levels in blood and mucosa of patients with esophageal (EC), gastric (GC) and colorectal cancer (CC), gastric ulcer (GU) and compared with normal esophagus (NE), stomach (NS) and colon (NC). respectively, 287 patients who underwent endoscopy were studied. SOD activity of the tissue and blood was determined using SUN's adrenaline auto oxidation method. LPO levels were determined according to YU's method.

RESULTS: The SOD activity and LPO level in blood and mucosa are shown in the Table 1 ($\bar{x} \pm s_{\bar{x}}$).

Table 1 Superoxide dismutase and lipid peroxide in blood and tissues of patients with gastrointestinal cancers

Groups	*n*	SOD (U/mg protein)		LPO (U/mg)	
		Tissue	Blood	Tissue	Blood
Normal stomach	60	1.90 ± 0.18	33.70 ± 1.73	0.01 ± 0.004	0.83 ± 0.01
Gastric ulcer	42	0.64 ± 0.40[e]	25.50 ± 0.67[b]	0.05 ± 0.010[b]	0.11 ± 0.02
Gastric cancer	43	0.37 ± 0.24[e]	27.86 ± 1.02[b]	0.06 ± 0.021[b]	0.12 ± 0.03
Normal esophagus	32	1.17 ± 0.70	30.80 ± 3.78	0.014 ± 0.005	0.08 ± 0.02
Esophageal cancer	52	0.39 ± 0.30[e]	28.23 ± 10.63	0.061 ± 0.033[b]	0.11 ± 0.02
Normal colon	28	0.81 ± 0.36	20.97 ± 4.77	0.012 ± 0.003	0.08 ± 0.03
Colon cancer	30	0.31 ± 0.17[b]	19.35 ± 7.32	0.069 ± 0.015[b]	0.11 ± 0.02

[b]$P < 0.001$, [e]$P < 0.01$ *vs* corresponding normal controls, respectively. SOD: Superoxide dismutase; LPO: Lipid peroxide.

CONCLUSION: SOD activity of the tissue is significantly decreased in EC. GC and CC. LPO levels were significantly higher than those of corresponding normal tissue. These results suggest that mucosal SOD and LPO levels are closely related to the pathogenesis of the gastrointestinal cancers.

Key words: Lipid peroxides; Superoxide dismutase; Free radical; Stomach neoplasms; Esophageal neoplasms; Colorectal neoplasms

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