Letters to the Editor

Gastric and Duodenal Ulcer and Risk of Bladder Cancer

To the Editors: In the Health Professional Follow-up Study, Michaud et al. (1) found a 55% increased risk of bladder cancer for subjects with a history of gastric ulcer. Previous epidemiologic investigations on the issue are limited to patients who had undergone gastric surgery (2, 3).

To provide further information on the topic, we report here data from a case-control study of bladder cancer, conducted in northern Italy between 1985 and 1992 (4).

The study included 727 cases (617 males, 110 females) with histologically confirmed, incident, transitional cell bladder cancer and 1,067 controls (769 males, 298 females) admitted for acute, nonneoplastic, nonurological, or genital tract diseases. Cases and controls were questioned by trained interviewers during their hospital stay. The proportion of refusals was <5%.

Odds ratios (OR) and 95% confidence intervals (CI) were obtained using multiple logistic regression, including terms for age, sex, center, and factors *a priori* identified as relevant in bladder carcinogenesis (5).

Table 1 shows the distribution of cases and controls according to history of gastric and duodenal ulcer. The multivariate ORs were 1.19 for gastric ulcer and 1.14 for duodenal ulcer. Bladder cancer risk increased with time since first diagnosis of gastric ulcer (OR for latency ≥30 years, 1.50) and was highest when gastric ulcer was diagnosed between ages 30 and 44 years (OR, 1.83) and before 1955 (OR, 2.03). When we considered the latency categories 15 to 29 and ≥30 years together, the OR for ≥15 years was 1.37 (95% CI, 0.83-2.25). For duodenal ulcer, the highest ORs were 1.62 for latency between 15 and 29 years, 1.41 for ulcer diagnosis between 30 and 44 years, and 1.35 for diagnosis between 1965 and 1974.

In support of an association between gastric ulcer and bladder cancer, we found a 19% increased risk among subjects with gastric ulcer, a direct association with latency, and consistent results with the Health Professional Follow-up Study. However, none of the ORs was significant, the OR was increased also for duodenal ulcer (although with no pattern for latency), and some residual confounding from smoking was possible. Nevertheless, for gastric ulcer, we found an increased risk of bladder cancer also among nonsmokers (OR, 1.23; 95% CI, 0.69-2.16).

Finally, we combined our results with those from the Health Professional Follow-up Study, finding a pooled relative risk of bladder cancer of 1.47 (95% CI, 1.10-1.95) for history of gastric ulcer. Risk was highest for subjects diagnosed with gastric ulcer before 1955 (relative risk, 1.83; 95% CI, 0.91-3.67) and lowest from 1975 (relative risk, 1.06; 95% CI, 0.62-1.83), thus supporting the hypothesis of an association and of a trend in risk with latency.

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Table 1. ORs and 95% CIs of bladder cancer according to history of gastric and duodenal ulcer, Italy, 1985 to 1992

	Gastric ulcer			Duodenal ulcer		
	Cases/controls	OR (95% CI)*	OR (95% CI)†	Cases/controls	OR (95% CI)*	OR (95% CI)†
Never	671/1,007	1‡	1‡	643/970	1‡	1‡
Ever	55/60	1.26 (0.84-1.87)	1.19 (0.79-1.80)	84/97	1.15 (0.84-1.59)	1.14 (0.81-1.59)
Time since ulcer diagnosis (years)						
<15	16/24	0.96 (0.49-1.88)	0.92 (0.46-1.83)	22/35	0.96 (0.55-1.69)	0.96 (0.53-1.73)
15-29	21/21	1.38 (0.72-2.62)	1.27 (0.66-2.45)	36/29	1.63 (0.97-2.74)	1.62 (0.95-2.77)
≥30	18/15	1.53 (0.75-3.13)	1.50 (0.72-3.13)	26/33	0.94 (0.55-1.61)	0.90 (0.52-1.57)
χ^2, trend§		0.63 (P = 0.43)	0.48 (P = 0.49)		0.18 (P = 0.67)	0.25 (P = 0.62)
Age at ulcer diagnosis (years)						
<30	11/18	1.03 (0.47-2.26)	1.02 (0.46-2.25)	14/28	0.77 (0.39-1.51)	0.80 (0.40-1.59)
30-44	19/17	1.75 (0.87-3.52)	1.83 (0.89-3.78)	36/37	1.42 (0.87-2.33)	1.41 (0.84-2.35)
≥45	25/25	1.11 (0.62-1.99)	0.98 (0.54-1.78)	34/32	1.17 (0.70-1.94)	1.12 (0.67-1.90)
χ^2, trend§		0.11 (P = 0.73)	0.30 (P = 0.59)		0.55 (P = 0.46)	0.37 (P = 0.55)
Calendar year of ulcer diagnosis						
Before 1955	15/8	2.17 (0.90-5.23)	2.03 (0.83-4.94)	20/22	1.12 (0.59-2.10)	1.09 (0.57-2.08)
1955-1964	12/14	1.23 (0.55-2.77)	1.16 (0.51-2.67)	19/22	1.24 (0.65-2.37)	1.25 (0.65-2.41)
1965-1974	12/16	1.07 (0.48-2.36)	1.02 (0.45-2.32)	24/20	1.41 (0.75-2.64)	1.35 (0.70-2.59)
1975 or after	16/22	1.02 (0.52-2.02)	0.97 (0.48-1.96)	21/33	0.94 (0.53-1.69)	0.95 (0.52-1.74)
χ^2, trend§		0.93 (P = 0.34)	0.62 (P = 0.43)		0.002 (P = 0.97)	0.04 (P = 0.85)

*ORs adjusted for age, sex, and study center.
†ORs adjusted for age, sex, study center, education, smoking habit, coffee consumption, and occupational exposure to potential bladder carcinogens (i.e., chemical industry, dyestuff, painting, pharmaceutical, coal, and gas).
‡Reference category.
§Based only on subjects with a history of the disease.

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