

Life Change and Gastric Cancer

STEVEN LEHRER, MD

Forty colorectal cancer patients, 14 gastric cancer patients, and 10 normal controls were tested with the Social Readjustment Rating Scale. The gastric cancer patients had a significantly higher amount of life change ($p < 0.05$) in the 2-year period preceding the onset of the first symptoms of their illness. Moreover, there was a significant ($p < 0.01$) negative correlation between amount of life change and age at onset of symptoms in gastric cancer, but not in colorectal cancer. There was also no correlation between age and life change in the normal controls. These findings suggest that emotional stress may be a predisposing factor in gastric cancer.

The cause of gastric cancer is unknown, though multiple factors are involved. Diet, for example, has been implicated, since cancer can be induced in some animals by the administration of N-methyl-N-nitrosoguanidine. Heredity also seems to play a role, for gastric cancer is two to four times more common in relatives of patients with the disease than in a control population. Gastric cancer has also been found marginally more common in persons with blood group A (1).

I now report that there is a significantly higher association of life change with gastric cancer than with either colorectal cancer or a normal control group. This finding suggests that emotional stress may be a promoting factor in gastric cancer.

To measure the degree of life change, the Social Readjustment Rating Scale (SRRS) was used (2). Previous studies with this instrument have shown that life

changes tend to cluster around health changes. Persons with the highest amount of life change demonstrate the most signs and symptoms. In myocardial infarction and sudden death, for example, marked elevations in magnitude of life changes appear in the 6 months prior to infarct or death. The occurrence of tuberculosis, the exacerbation of diabetes mellitus, and the postoperative persistence of symptoms after duodenal ulcer surgery also are associated with increased life change scores (2).

Further, the notion that there may be a link between emotions and cancer is not new (4, 5). In the 1950s Greene and co-workers tested patients with leukemia and Hodgkin's disease and discovered that the development of the maladies occurred in a setting of emotional distress (6-8). LeShan studied more than 400 cancer patients and reported that 72% had suffered the loss of a central relationship in the period ranging from 8 years to a few months prior to the onset of disease—compared to 10% in a control group (9). Thomas, Duszynski, and Shaffer have shown that male medical students who later developed cancer had a lack of closeness to parents (10). Greer, Morris, and Pettingale reported that recurrence-free survival after breast cancer treatment

From the Veterans Administration Hospital, Bronx, New York.

Address requests for reprints to: Dr. Steven Lehrer, Associate Radiation Therapist, Veterans Administration Hospital, 130 West Kingsbridge Road, Bronx, NY 10468.

Received for publication January 31, 1980; revision received June 28, 1980.

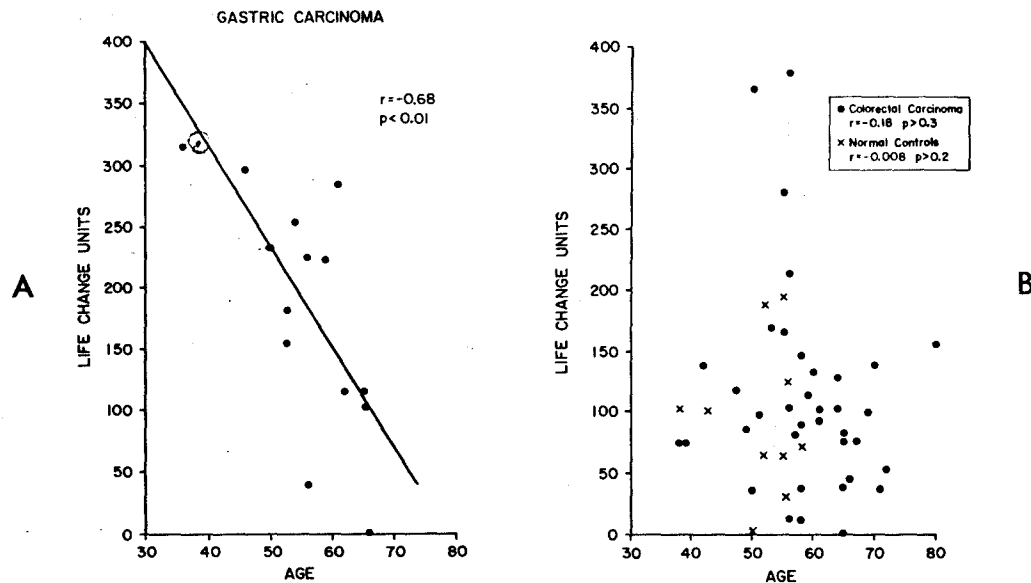


Fig. 1. (A) Life change score versus age in gastric cancer patients. Note the significant negative correlation. (B) Life change score versus age in colorectal cancer patients and a comparison group. Note the absence of a significant negative correlation. The significant negative correlation implies that a smaller amount of life change was necessary to precipitate the onset of gastric cancer in older patients. This would be expected if life change is a promoting factor, since older persons are more susceptible to gastric cancer than are younger ones.

was more common in two types of patient: those who had initially reacted by denial or who had a fighting spirit (11). In a study by Frasc, Litin, and Pearson, 76% of 46 patients with pancreatic carcinoma had psychiatric symptoms closely related to the presence of the neoplasm (12).

In the present study, the 2-year period prior to the patients' onset of first tumor symptoms was evaluated. The life change unit (LCU) score represents the sum of scores for individual life change items across the 2-year interval. Mean 2-year LCU scores were computed for gastric cancer, colon cancer, and comparison subjects. Any event occurring twice was scored twice. Those patients who could read the scale were allowed to mark off the events by themselves. If a patient could not read the scale, the test was administered verbally.

The series of patients with gastric and colorectal cancer was a consecutive one, seen in the Bronx V.A. Hospital during 1978 and 1979. All cases were selected at random. All patients were veterans with similar life-styles and from a similar social stratum. The 10 individuals in the comparison group were male veterans, for the most part employees of the hospital, in good health, and socially matched to the patient groups. Fifty-four cancer patients were studied. All the colorectal cancer patients were male. There were thirteen male and one female gastric cancer patients.

An interesting characteristic of the data is the significant negative correlation between the gastric cancer LCU scores and age of patient at the time of onset of first tumor symptoms ($r = -0.68$, $p < 0.01$). In other words, as age increased, the amount

LIFE CHANGE AND GASTRIC CANCER

of associated life change diminished. Since older patients are more prone to gastric cancer than are younger ones, this negative correlation implies what would be expected: a smaller amount of life change was necessary to precipitate the onset of gastric cancer in older patients. There was no such significant correlation between colorectal cancer LUC score and age ($r = -0.18, p > 0.3$). The normal controls also had no such significant correlation ($r = -0.008, p > 0.2$) (Figure 1).

The mean score of the 40 colorectal cancer patients was 110.2 ± 83.2 LCU. The mean score of the 14 gastric cancer patients was 180.9 ± 96.9 LCU. The difference between these scores is significant ($t = 2.57, p < 0.05$, two-tailed).^{*} All the tumors were biopsy-proven adenocarcinomas.

The 10 individuals in the comparison group had a score of 93.1 ± 60.8 LCU. This was significantly different from the score of the gastric cancer patients ($t = 2.42, p < 0.05$, two-tailed).

Jenkins, Hurst, and Rose have recently pointed out that life change events are forgotten at the rate of 5% per month,

though this rate is highly variable over long intervals (4). In the present study, the mean elapsed time between first symptoms and interview was 28 months in colorectal cancer and 39 months in gastric cancer. If this could be accurately corrected for, the difference between LCU scores in the two types of cancer would be even more pronounced. In the comparison group, the 2-year period in question was that immediately prior to interview.

The distribution of the colorectal cancer scores suggests that the four cases with a score of more than 180 LCU may be associated with a high LCU subgroup. The number of cases, however, is too small to be certain.

Despite the probable links between emotions and cancer, it is difficult to say why life change stress should, in general, be more closely associated with gastric cancer than with colorectal cancer. The tumors are similar histologically, both adenocarcinomas; and both the stomach and the colon react physiologically to stress. Perhaps colorectal cancer patients report relatively few recent life changes because this neoplasm is more related to a lifelong habit of dietary intake and thereby is a less "stress-related" disease than is gastric cancer.

The author is grateful to Dr. Bernard Roswit for his support and encouragement.

^{*}The mean elapsed time between symptom onset and diagnosis in stomach cancer was 15.8 ± 4.4 months. The corresponding period in colorectal cancer was 5.2 ± 4.4 months.

REFERENCES

1. Macdonald WC, Rubin CE: Cancer, benign tumors, gastritis, and other gastric diseases, in Harrison's Principles of Internal Medicine, 8th ed., p 1510, 1978
2. Petrich J, Holmes TH: Life change and onset of illness. *Med Clin North Am* 61:825-838 1977
3. Jenkins CD, Hurst MW, Rose RM: Life changes—do people really remember? *Arch Gen Psychiatry* 36:379-384, 1979
4. Cancer and the mind: how are they connected? *Science* 200:1363-1364, 1978
5. Mind and cancer. *Lancet* 1:706-707, 1979
6. Greene WA: Psychological factors and reticuloendothelial disease I. *Psychosom Med* 16:220-230 1954
7. Greene WA, Young L, Swisher SN: Psychological factors and reticuloendothelial disease II. *Psychosom Med* 18:284-303, 1956

8. Greene WA, Miller G: Psychological factors and reticuloendothelial disease IV. *Psychosom Med* 20:122-144, 1958
9. LeShan L: *You Can Fight for Your Life: Emotional Factors in the Causation of Cancer*. New York, M. Evans, 1977
10. Thomas CB, Duszynski KR, Shaffer JW: Family attitudes reported in youth as potential predictors of cancer. *Psychosom Med* 41:287-302, 1979
11. Greer S, Morris T, Pettingale KW: Psychological response to breast cancer: effect on outcome. *Lancet* 2:785-787, 1979
12. Fras I, Litin E, Pearson JS: Comparison of psychiatric symptoms in carcinoma of the pancreas with those in some other intra-abdominal neoplasms. *Am J Psychiatry* 123:1553-1562, 1967