

Heterogeneity of Duodenal Ulcer as Suggested by Differences in Gastrin Response to a Protein Meal

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Serum gastrin response (GR) to a protein meal is a parameter of pathophysiological significance in duodenal ulcer (DU) reflecting functioning G cell mass.¹ We studied this response in a group of patients with DU trying to correlate it with differences in clinical manifestations. Such differences would be suggestive of diverse pathophysiological pathways.

MATERIAL AND METHODS

Twenty-five patients with verified DU and ten normal controls were studied. Eighteen were men and seven were women and their ages ranged from 18 to 83 with a mean age of 48.2 years. After at least 12 hours of fasting, blood was taken and a protein meal, consisting of 180 grams of fatless grilled veal meat, was given. New samples of blood were taken 30, 60, and 90 minutes after the meal. Gastrin was measured by radioimmunoassay (RIA). All samples were assessed in duplicate at the same time and the values were expressed as picograms per ml at each time point. Total gastrin output (TGO) and integrated gastrin response (IGR) were also calculated. Statistical analysis was done by using Student's t-test.

RESULTS

Fasting gastrin levels (GL) of controls and patients were quite similar. On the contrary, GL of patients at 30, 60, and 90 minutes after the meal were significantly higher than the controls ($p < 0.001$). The same applies to TGO and IGR. Among the subgroups of the patients examined, there was no significant difference between men and women and between blood group 0 to blood groups A, B, and AB. On the contrary, there were significantly increased responses of GL, TGO, and IGR in bleeders as

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compared to nonbleeders and in symptomatic bleeders as compared to bleeders with no previous ulcer pain history (TABLE I and FIG. 1).

DISCUSSION

It is well known that gastrin response to a protein meal is increased in DU patients.² Also, there is evidence^{1,3} that some DU patients have a normal response. It is conceivable that differences in GR to the protein meal would be suggestive of

TABLE I. Gastrin Levels (Mean \pm Standard Deviation) before and after a Protein Meal^a

Subject Group	Minutes after the Protein Meal				TGO	IGR
	0	30	60	90		
Controls (10)	69.5 ± 8.5	107.4 ± 8.17	93.5 ± 8.13	87.5 ± 7.75	8382 ± 622	2127 ± 542
UD patients (25)	74.92 ± 7.01	123.6 ^b ± 18.54	117.0 ^c ± 17.72	110.2 ^c ± 19.56	10017 ^e ± 1382	3274 ^f ± 1413
Men with UD (18)	74.39 ± 7.75	121.56 ± 18.24	115.94 ± 17.29	109.83 ± 18.09	9888 ± 1353	3193 ± 1332
Women with UD (7)	76.29 ± 4.86	128.86 ± 19.7	122.43 ± 19.35	114.71 ± 21.58	10064 ± 1060	3484 ± 1699
Blood group O (12)	77.75 ± 7.36	130.67 ± 16.27	124.0 ± 15.99	117.0 ± 16.04	10561 ± 1206	3563 ± 1292
Blood group A, B, AB (13)	72.31 ± 5.76	117.08 ± 18.68	111.31 ± 18.6	102.4 ± 21.99	9515 ± 1385	3008 ± 1516
Nonbleeders with UD (9)	72.89 ± 6.07	112.22 ± 15.1	108.0 ± 13.63	98.56 ± 16.05	9178 ± 1114	2618 ± 1040
Bleeders with UD (16)	76.06 ± 7.42	130.0 ^d ± 17.53	123.85 ^b ± 17.73	116.75 ^d ± 18.64	10489 ^d ± 1317	3640 ^b ± 1479
Asymptomatic bleeders (6)	79.0 ± 5.33	119.0 ± 6.51	110.67 ± 7.61	103.0 ± 10.04	9628 ± 566	2510 ± 633
Symptomatic bleeders (10)	74.3 ± 8.18	136.6 ^d ± 18.96	130.8 ^e ± 17.96	125.0 ^e ± 17.93	11011 ^d ± 1381	4324 ^e ± 1447

^aTGO = total gastrin output, IGR = integrated gastrin response. Figures in parentheses are the number of patients in each group.

^b $p < 0.05$.

^c $p < 0.001$.

^d $p < 0.02$.

^e $p < 0.01$.

pathophysiologic differences that might be expressed by different clinical characteristics. In our study we verified that DU patients have higher GR than normal controls. However, when analyzing the results according to various clinical characteristics of the patients, some interesting findings emerged. First, patients with DU and history of bleeding had significantly higher GL at 30, 60, and 90 minutes after the meal and higher TGO and IGR as well than nonbleeders. Among bleeders, those with a history of ulcer pain before bleeding had significant higher responses than the asymptomatic bleeders. These results are suggestive of pathogenetic heterogeneity of DU, which may possibly lead to different clinical manifestations.

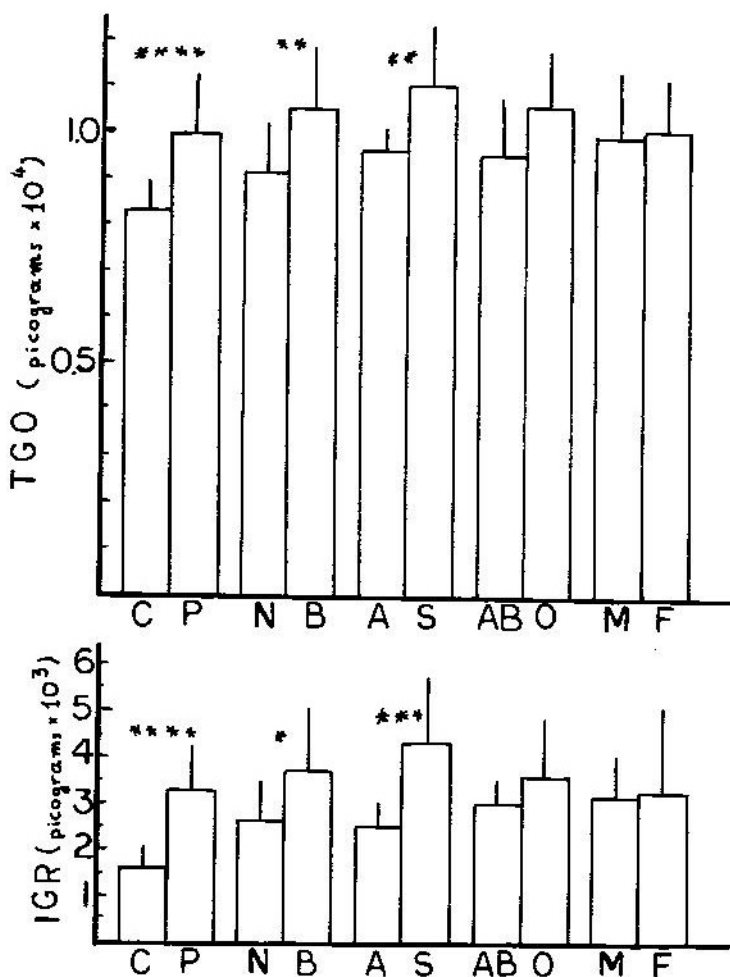


FIGURE 1. TGO and IGR for controls (C), patients with DU (P), nonbleeders (N), bleeders (B), asymptomatic bleeders (A), bleeders with typical ulcer pain before bleeding (S), patients with blood groups A, B, AB(AB), patients with blood group O (O), male DU patients (M), and female DU patients (F). Statistically significant differences are marked as * ($p < 0.05$), ** ($p < 0.02$), *** ($p < 0.01$), and **** ($p < 0.001$).

REFERENCES

1. BYRNES, D. J., S. K. LAM & W. CIRCUS. 1976. The relation between functional parietal cell and gastrin cell masses in two groups of duodenal ulcer patients. *Clin. Sci. Mol. Med.* **50**: 375-383.
2. MCGUIGAN, J. E. & W. L. TRUDEAU. 1973. Differences in rates of gastrin release in normal persons and patients with duodenal ulcer disease. *N. Engl. J. Med.* **288**: 64-66.
3. FRITSCH, W. P., T. U. HANSAMEN & W. RICK. 1976. Gastric and extragastric gastrin release in normal subjects, in duodenal ulcer patients, and in patients with partial gastrectomy (Billroth I). *Gastroenterology* **71**: 552-557.