

The Distinction Between Gastric Ulceration and Carcinoma of the Stomach^{*}

VALUE OF THE ERYTHROCYTE SEDIMENTATION RATE AND THE MAXIMAL ACID OUTPUT

O. A. A. BOCK, D.M. UNIV. OXON., F.C.P. (S.A.), AND I. H. BOYD, M.SC., *Department of Medicine and Department of Radiology, University of Stellenbosch and Karl Bremer Hospital, Bellville, CP*

SUMMARY

The erythrocyte sedimentation rate (ESR) is not a reliable criterion for distinguishing between gastric ulceration and carcinoma of the stomach.

If the maximal acid output (MAO) = 0 mEq/h, the lesion is, with few exceptions, a carcinoma.

Combining the ESR and MAO did not provide a more reliable criterion for distinguishing between gastric ulcer and carcinoma of the stomach, than when MAO alone is taken into consideration.

S. Afr. Med. J., 47, 1259 (1973).

Physicians attach a lot of value to the erythrocyte sedimentation rate (ESR); a patient with an elevated ESR is more likely to be suffering from a serious disease than a patient with a normal ESR. In the context of gastric ulceration and carcinoma of the stomach, an elevated ESR would be regarded as a point in favour of carcinoma. The association of carcinoma of the stomach with diminished gastric acid secretion is well known.

It was our impression that the ESR was frequently elevated in patients with benign gastric ulceration, and not infrequently normal in patients with carcinoma of the stomach. Furthermore, the level of acid secretion seemed to be equally unreliable, apart from those patients who had achlorhydria, who, with one exception, all had carcinoma. It was decided, therefore, to test this impression by more careful analysis.

PATIENTS

The ESR was estimated in 201 patients with gastric ulceration and 146 patients with carcinoma of the stomach, and the maximal acid output (MAO) was determined in 169 and 69, respectively.

METHODS

The tests of maximal acid output were performed as has been previously described.¹ Achlorhydria means MAO = 0 mEq/h.

The ESR were expressed in mm Westergren in the first hour. The values were determined by either the haematological laboratory, in the case of outpatients, or by the students and interns, in the case of inpatients. Where more than one ESR reading was available, the higher reading was used for this analysis.

RESULTS

In order to find a reliable criterion for discriminating between gastric ulceration and carcinoma of the stomach, the available results were analysed in three ways: (a) considering ESR alone; (b) considering MAO alone; and (c) considering ESR and MAO together.

ESR Alone

Fig. 1 shows the median and middle 80% interval for groups of gastric ulcer and carcinoma patients. Bearing in mind the frequently encountered elevation of the ESR in apparently healthy elderly patients,² the patients have been divided into three age groups.

The median ESRs of all the carcinoma groups are elevated to above 30 mm in the first hour, and are over double those of the corresponding gastric ulcer groups, except in the over 70 age group, where the median value for patients with gastric ulceration is also elevated to above 30 mm in the first hour.

MAO Alone

Fig. 2 shows the median and middle 80% interval of the MAOs of patients with gastric ulceration and carcinoma, divided according to sex.

The median MAOs of carcinoma patients in both male and female groups are less than 1.0 mEq/h, owing to the presence of a large proportion (30-50%) of achlorhydric patients. As in the ESR analysis, there is a large spread in the MAO values of patients in any one group.

Table I gives the percentages of patients having a MAO less than a certain value, and the number of patients

^{*}Date received: 17 January 1973.

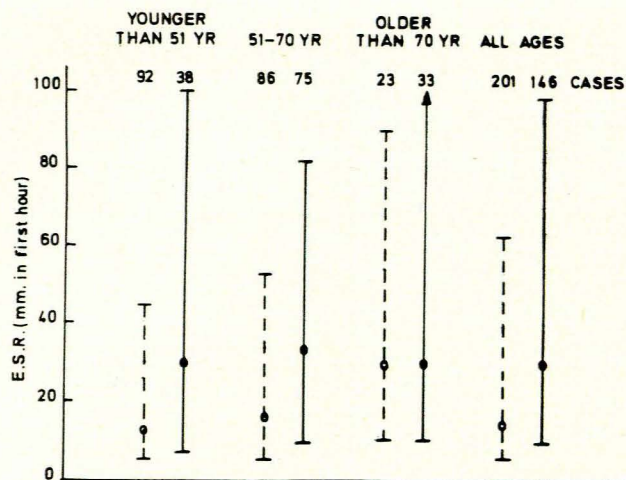


Fig. 1. Erythrocyte sedimentation rate. The median (0) and middle 80% interval for patients with carcinoma of the stomach (solid line) and patients with gastric ulceration (stippled line). The middle 80% interval of a group of values contains 80% of the values in the group, and is so spaced that of the values not falling in the interval, half fall above and half below it. The middle 80% interval is a useful measure of dispersion in highly skewed distributions.

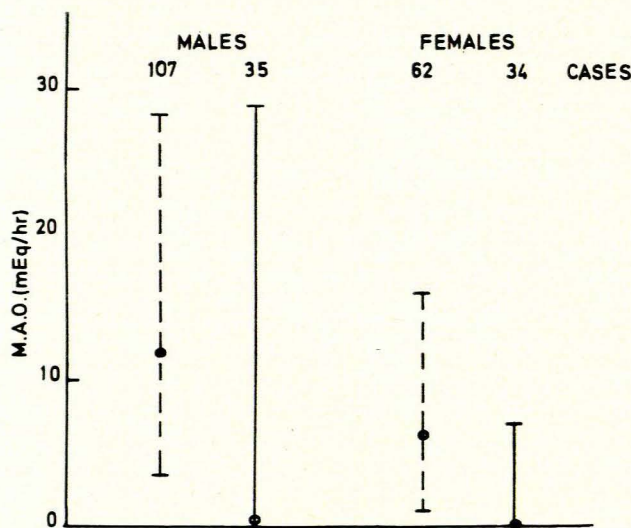


Fig. 2. Maximal acid output. The median (0) and middle 80% interval for patients with carcinoma of the stomach (solid line) and patients with gastric ulceration (stippled line).

with gastric ulceration, out of every 100, with a MAO less than a certain value.

It is seen that achlorhydria is found in only a very small percentage of gastric ulcer patients, and its presence is thus a reliable indicator of carcinoma of the stomach. On the other hand, more than half of the carcinoma patients do not have achlorhydria and would not be diagnosed by this criterion.

TABLE I. THE USE OF MAO AS A CRITERION FOR DISCRIMINATING BETWEEN GASTRIC ULCERATION (GU) AND CARCINOMA OF THE STOMACH (CA)

MAO	P				N	
	Males		Females		Males	Females
	GU %	Ca %	GU %	Ca %		
= 0	0,9	31	0,0	47	8*	0
≤ 3	7	60	23	79	25	34
≤ 5	22	66	39	91	50	44

P = percentage of patients with MAO less than the given value.
N = number of patients who will have gastric ulceration out of every 100 with MAO less than the given value.

* represents 1 gastric ulcer patient in a group of 12 achlorhydric males.

MAO and ESR Together

Consideration of ESR and MAO together does not form a more reliable criterion than MAO alone, because for example, 4% of gastric ulcer patients and 35% of carcinoma patients have an MAO of less than 3,0 mEq/h and an ESR greater than 30 mm in the first hour; and of every 100 patients who satisfy this criterion, as many as 23 will have gastric ulceration. Reference to Table I shows that this is not a significant improvement over the use of the MAO alone.

DISCUSSION

These findings bear out the generally accepted fact that a high ESR tends to be associated with a carcinoma, rather than with a gastric ulcer. However, the large middle 80% interval indicates a wide variation of ESR among patients of one group, and there was an appreciable proportion of patients with gastric ulceration and an elevated ESR, while many patients with carcinoma of the stomach had a normal ESR.

Although a low acid secretion did not help in distinguishing between gastric ulceration and carcinoma of the stomach, it is still worth doing a test of maximal acid output when in doubt, because only one of the 169 patients with gastric ulceration had achlorhydria, whereas 27 of the 69 with carcinoma were achlorhydric.

Because an elevated ESR is more often associated with carcinoma of the stomach than with gastric ulceration, and a low acid secretion is a feature of many patients with carcinoma of the stomach, it was anticipated that a patient with a high ESR and very low acid secretion, would have a high statistical risk of carcinoma of the stomach, but this was not proved in the series.

REFERENCES

1. Bock, O.A.A. (1969): S. Afr. Med. J., 43, 434.
2. Boyd, R. V. and Hoffbrand, B. I. (1966): Brit. Med. J., 1, 901.