

*Current practice***Endoscopy and gastric cancer**

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**SUMMARY** In an attempt to assess the impact of upper gastrointestinal endoscopy on the outcome of patients with gastric cancer, we have studied 483 patients with gastric cancer from three centres with differing endoscopic practice. The introduction of an open access general practitioners endoscopy service led to a 10-fold increase in the number of endoscopies being performed per head of population, but there was no demonstrable effect on prognosis or on the duration of symptoms before diagnosis. There was no increase in the proportion of early gastric cancer diagnosed.

There have been considerable technological advances since the introduction of the gastroscope, but very few reports documenting its actual influence on disease morbidity or mortality. In the case of gastrointestinal haemorrhage, despite theoretical reasons to suggest the contrary, there has been no documented reduction in morbidity or mortality since the introduction of endoscopy.<sup>1</sup>

We have tried to assess the effect of different endoscopic practice on the diagnosis and outcome of patients with gastric cancer in order to see if the increasing availability of endoscopy resulting from the introduction of an open access general practitioners endoscopy service can be justified. We have also studied a group of early gastric cancers, as it is these patients who should benefit most from the introduction of screening programmes.

**Methods****PATIENTS**

Patients with histologically confirmed gastric cancer were collected retrospectively in three centres within a 30 mile radius. They were collected by reviewing pathological records, hospital discharge summaries, and surgical records over a five year period (1974-79). In Centre A there was a direct referral general practitioners endoscopy service as well as a freely available hospital referral service.<sup>2</sup> In Centre B endoscopy was confined to hospital clinics but was

readily available. In Centre C endoscopy was confined to hospital clinics but on a very limited basis. Table 1 shows the approximate number of endoscopies performed per year in the three centres and the number per thousand of population served by the respective district general hospitals.

By reviewing the notes, the duration of symptoms before diagnosis and survival from operation was recorded for each patient. Survival at one year was also noted. The percentage of patients in each group attending initially for endoscopy or radiology was recorded. From the radiologist's report on the barium meal patients were divided into those with definite or probable malignancy, those with other abnormalities of the stomach in which there was no comment of malignancy, and those with an entirely normal stomach. All barium studies were single contrast. The result of endoscopy was taken from the original report, but included the result of histology. Where possible the final histological interpretation was obtained from surgical specimens and the term 'early gastric cancer' was used for those lesions confined to the mucosa or submucosa.

Table 1 *Availability of endoscopy with numbers performed in three centres*

Centre	Mode of referral for endoscopy	Approximate number	
		Endoscopies per year	Per 1000 of population
A	GP and OPD	1500	11.3
B	OPD	2000	5.8
C	'Limited'	250	1.5

Table 2 Delay in diagnosis and survival figures in patients with gastric cancer from three centres

Centre	Cancers (no.)	Duration of symptoms before diagnosis (weeks)	Survival from time of diagnosis (weeks)	Alive after 1 yr (%)	Early gastric cancers	
					(no.)	(%)
A	174	22 ( $\pm$ 42)	22 ( $\pm$ 31)	25.4	3	1.7
B	186	24 ( $\pm$ 40)	27 ( $\pm$ 26)	24.6	3	1.6
C	123	22 ( $\pm$ 36)	24 ( $\pm$ 33)	23.8	2	1.6

Because regional differences in record keeping affected the success rate of tracing patient records, the three groups are not strictly comparable and the figures cannot be used to indicate a true reflection of the incidence of the disease, which, according to information obtained from death certificates, is similar in the three areas.

The unpaired *t* test was used for statistical analysis.

## Results

A total of 483 patients was studied. Table 2 shows the number of patients in each group with duration of symptoms before diagnosis and survival periods. Table 3 shows percentages in each group attending initially for either endoscopy or barium studies and also the total number undergoing these investigations. From evidence obtained by studying endoscopies performed over a fixed one month period, there was no difference in the proportion of endoscopies performed by junior staff at any of the three centres. The results confirmed the differing endoscopic practice, in that only 3% of patients in Centre C were referred initially for endoscopy and

only 40% examined endoscopically at any time. In the other two centres, about half presented initially for endoscopy and over two-thirds were endoscoped in all. Table 4 shows the results of the barium meal findings in the three centres. The abnormalities of the stomach, in which malignancy was not mentioned, included ulcers considered to be benign, areas of mucosal irregularity, and pyloric stenosis. This Table also shows the false negative rate of endoscopy combined with biopsy—that is, the number missed by endoscopy.

There was no significant difference between the duration of symptoms of those patients initially diagnosed by barium studies and those diagnosed by endoscopy. There was no significant relationship between the duration of symptoms before diagnosis and the duration of survival after diagnosis. Thus 194 patients presented with symptoms of less than six months' duration, 186 with symptoms for between six to 12 months, and 113 with symptoms for more than one year and their respective survival periods were  $22 \pm 38$  weeks,  $23 \pm 33$  weeks, and  $25 \pm 36$  weeks.

In Centre A, 48 patients with gastric cancer were diagnosed by the general practitioners referral service, compared with 64 via the hospital outpatient referral service. There was no significant difference between the duration of symptoms in these two groups ( $21 \pm 32$  weeks and  $22 \pm 40$  respectively). The percentage alive at one year was 24% and 26% respectively. One early gastric cancer was found in each group.

A total of eight early gastric cancers was found, an overall incidence of 1.6% of the total number of gastric cancers. Three were from Centre A (1.7%), three from Centre B (1.6%), and two were from Centre C (1.6%). Another six patients with early gastric cancer were found by reviewing pathological records beyond the limits of the present study, and we were therefore able to review a total of 14. Two presented with haematemesis, the other 12 with non-specific upper gastrointestinal symptoms. The duration of symptoms in these patients ranged from one to 10 years, with a mean of 3.4 years. All underwent barium meals and endoscopy, which initially showed abnormality in eight and 10 respectively.

Table 3 Endoscopy and radiological investigations of patients with gastric cancer in three centres

Centre	Initial diagnostic method		Total undergoing investigation	
	Endoscopy (%)	Ba. meal (%)	Endoscopy (%)	Ba. meal (%)
A	40	48	69	77
B	59	41	70	61
C	3	97	40	100

Table 4 Results of radiological examination in three centres

Centre	Barium meal findings (%)			Endoscopic false negatives (%)
	Probable cancer	Some abnor- malities in stomach	Completely normal	
A	70.2	24.4	5.4	3.8
B	72.5	21.3	6.2	4
C	68.0	26.6	6.0	8

## Discussion

The prognosis of patients with gastric cancer is poor,<sup>3,4</sup> the five year survival being approximately 10% in the United Kingdom.<sup>5</sup> A breakdown of these figures shows that early gastric cancer has an exceptionally good prognosis, approaching 95% at five years.<sup>5</sup> In Japan, gastric cancer is three times as common as in the United Kingdom<sup>6</sup> and patients present at a younger age.<sup>7</sup> As a result, extensive screening programmes were instituted, and have led to an increase in the proportion of early gastric cancer from 1.3% in 1941–45 to 36% in 1965, with a corresponding improvement in 10 year survival from 10 to 26% overall.<sup>8</sup> These results are encouraging but somewhat difficult to interpret, as we know little of the natural history of these early lesions if left untreated.

Recent evidence has emerged that, contrary to previous opinion, there is no epidemiological or pathological difference between early gastric cancer in the West and Japan.<sup>7,9</sup> There have been isolated reports suggesting that, even in the West, the introduction of endoscopy on a large scale might lead to an increase in the proportion of early gastric cancer discovered and therefore an improved prognosis.<sup>10,11</sup> Screening programmes for gastric cancer have also been contemplated.<sup>12</sup>

In this study we have failed to show any beneficial effect from increasing the availability of endoscopy either on the diagnosis, or on the prognosis, of patients with gastric cancer and we must conclude that the inevitable rise in the number of investigations being performed as a result of the introduction of a general practitioner service cannot be justified on the basis of benefit to these patients. It is unlikely, although possible, that differences in surgical practice between the centres would be affecting the results and our findings would seem to support the view that we are already over-investigating patients with upper gastrointestinal symptoms.<sup>13,14</sup>

Reviewing the radiographic findings, only 6% of patients with gastric cancer had a completely normal stomach, a figure that is similar to previous reports.<sup>15,16</sup> Even in patients with early gastric cancer, radiology was nearly as successful in diagnosis as endoscopy, although endoscopy was required to confirm the diagnosis. It is not the purpose of this paper to discuss the relative merits of endoscopy and radiology, but our findings do stress the necessity of endoscopy in those patients with any abnormality of the stomach on barium meal.<sup>17</sup> The false negative rate of endoscopy was generally higher than expected, although that of Centre C was probably falsely high due to the small numbers studied. It is not possible to be certain how many lesions are being missed at an early stage. Most of the 'false negatives' at endoscopy

were performed less than a month before diagnosis and only two of the 12 early gastric cancers were missed at the first endoscopy.

Our evidence that patients with gastric cancer diagnosed soon after the onset of their symptoms do no better than those diagnosed later in the course of their disease is consistent with others<sup>3</sup> and suggests that the only way screening might be expected to affect prognosis is to detect asymptomatic patients. Available evidence, itself inevitably biased by current endoscopic practice, would suggest that gastrointestinal symptoms are present in 90% of patients with early gastric cancer, even in Japan.<sup>18,19</sup> Symptoms had been present for long periods in our patients with early gastric cancer but, by contrast, many patients with advanced cancer appeared to have only a short history. This would support the hypothesis made before the Japanese experience that the prognosis for gastric cancer depends more on the biological pre-determination than the timing of diagnosis or treatment.<sup>20</sup> Additional empirical evidence to support this can be found in our small group of early gastric cancer, as one patient who presented with a haematemesis had had a haematemesis five years previously. Barium meal and endoscopy at this time showed a lesion thought to be cancer in the same area that was later shown to be the site of the early gastric cancer. Between these haematemeses the patient was lost to follow-up and may therefore have had this lesion for five years before it was diagnosed. Similarly, another patient was not treated surgically after diagnosis because of his general ill health but has remained well, and, five years later, although he has not undergone further endoscopy, shows no evidence that his disease has spread. Our results confirm the relatively good prognosis of early gastric cancer in the United Kingdom<sup>21</sup> but suggest that the natural history of these lesions may be prolonged and that delay in diagnosis, although unfortunate, may not necessarily be life threatening.

In conclusion, we have failed to show any evidence that the introduction of a general practitioners endoscopy service results either in earlier diagnosis of gastric cancer or increase in the proportion of early gastric cancer. There is no doubt that endoscopy has revolutionised the diagnosis of gastric cancer and has resulted in more accurate diagnosis with fewer unnecessary diagnostic laparotomies. There is a need for a readily available endoscopy service, but it remains to be determined which is the best way of organising these facilities. Our results show that greater ease of access to endoscopy cannot be expected to result in a dramatic improvement in survival figures for patients with symptomatic gastric cancer. The results confirm that, for any screening programme to be successful, it would be necessary to

screen very large numbers of asymptomatic patients. With certain exceptions, lack of facilities, cost-effectiveness, and patient compliance mean that this is not at present a practical proposition.

## References

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