PAPERS AND SHORT REPORTS

On the reputed decline in gastric carcinoma: necropsy study from western Norway

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Abstract

Carcinoma of the stomach is said to be decreasing in many countries, Norway included. About 10% of all cases in Norway occur in the county of Hordaland. They do not differ in any known respect from cases in the rest of the country. A series of 575 cases coming to necropsy from Hordaland over 25 years was examined and the findings compared with the total number reported to the Norwegian Cancer Registry from the same district. Although the incidence of histological verification rose over the period from 49 to 85%, the number of histologically confirmed cases remained relatively constant, the considerable decline being confined to cases without such documentation.

The results suggest that increased diagnostic effort has led to the exclusion of cases previously classified clinically as gastric carcinoma and that the incidence of the disease itself has not changed radically in the county of Hordaland.

Introduction

The incidence of gastric carcinoma is said to be decreasing,¹⁻⁶ and the corresponding decline in mortality is thought not to be due to improved treatment as the incidence and mortality have remained similar.⁷ Study of cases coming to necropsy from the county of Hordaland over 25 years failed, however, to show the expected decrease. This observation prompted further analysis of all cases reported from that district. The results, presented here, show that the decline was confined to cases without histological verification and suggest that the incidence of gastric carcinoma may not in fact be declining.

Subjects and methods

Over the 25 years 1955-79, 20 490 necropsies were carried out at this institute. The number of necropsies a year rose in the first 15 years and fell thereafter (fig 1). The number of surgical biopsies

FIG 1—Total number of necropsies and biopsies relative to size of population in Hordaland.

performed rose over the whole period. The total population in the district (Hordaland) increased by 20.5% at a rate of 0.78% a year, giving an increase in biopsies/1000 of the population a year from 21.3 in 1955 to 44.8 in 1979.

Among subjects undergoing necropsy were 575 with gastric carcinoma from Hordaland—that was, excluding those in whom gastric carcinoma was seen after gastrectomy for a benign lesion (35 cases) or in whom histology from the primary tumour was missing (21 cases). The age at diagnosis, the patient's sex, and the clinical diagnosis were recorded.

Histological classification was performed on slides recovered from the files. These were from the primary tumours (formalin fixed, paraffin embedded) and were stained with haematoxylin and eosin. The Lauren classification was used.⁸ This divides carcinomas into

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three types—intestinal, diffuse, and unclassifiable (others). The tumours were classified consecutively by one of us (HM-M) without knowledge of the clinical or necropsy data.

We compared our findings with those for Norway as a whole and all cases reported for Hordaland. The figures obtained from the Norwegian Cancer Registry included cases reported on the basis of clinical findings, histology from the primary tumour or a metastasis, necropsy reports, and death certification.⁹

Figure 2 shows proportional distribution of the population aged over 20 in Hordaland, from figures given by the Central Bureau of Statistics.

FIG 2—Relative age and sex distribution (%) of population aged over 20 in Hordaland in years 1960 (■), 1967 (□), and 1979 (▨).

FIG 3—Distribution of total number of cases of gastric carcinoma in Norway relative to number in Hordaland 1955-79.

Results

Cases of gastric carcinoma from Hordaland accounted for about 10% of all cases in Norway as a whole. Figure 3 shows the steady decline in the total number of cases recorded for both populations over 1955-79. The actual number of cases of histologically verified gastric carcinoma from Hordaland (table I), however, showed little change over the period studied (range 372-425 per five year period). In contrast, the total number of cases fell from 763 to 483 (37%). The proportion of histologically verified cases increased steadily from 49 to 85%. Thus the number reported on the basis of clinical findings alone dropped correspondingly.

Table II gives the age distribution in the necropsy series. Patients died aged between 21 and 96, with most dying in their 70s. The pattern was similar during each of the five periods. The mean age of all the patients from Hordaland reported to the Norwegian Cancer Registry differed little from that of patients with gastric cancer reported on the basis of surgical biopsies or necropsy.

The sex distribution for patients from Hordaland with gastric carcinoma reported to the Norwegian Cancer Registry over the

25 years was relatively constant; about 55% were men and 45% women. In the histologically verified cases the male to female ratio was about 60 to 40.

On histological classification about half of all cases were of intestinal type, with 30% diffuse (table III). There was no appreciable difference in distribution of the three histological types over the years.

TABLE I—Number of cases of gastric carcinoma reported to Norwegian Cancer Registry from Hordaland, 1955-79, according to whether histologically verified

	No (%) of cases		Total
	Histologically verified	Not histologically verified	
1955-9	372 (49)	391 (51)	763
1960-4	400 (55)	325 (45)	725
1965-9	392 (65)	211 (35)	603
1970-4	425 (74)	152 (26)	577
1975-9	409 (85)	74 (15)	483

TABLE II—Age distribution by five year period of patients from Hordaland with gastric carcinoma who underwent necropsy in 1955-79

n	No (%) of patients aged:							
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
1955-9	102	1 (1)	6 (6)	6 (6)	14 (14)	25 (25)	35 (34)	15 (15)
1960-4	99	1 (1)	4 (4)	10 (10)	18 (18)	17 (17)	38 (38)	11 (11)
1965-9	137	1 (1)	3 (2)	10 (7)	18 (13)	32 (23)	48 (35)	24 (18)
1970-4	129	1 (1)	4 (3)	11 (9)	19 (15)	29 (22)	44 (34)	19 (15)
1975-9	108	2 (2)	4 (4)	3 (3)	15 (14)	27 (25)	35 (32)	16 (15)
1955-79	575	6 (1)	21 (4)	40 (7)	84 (15)	130 (23)	200 (35)	85 (15)

TABLE III—Relative distribution at necropsy of histological types (Lauren) of gastric carcinoma from Hordaland, 1955-79

	No (%) of cases			Total
	Intestinal	Diffuse	Unclassifiable	
1955-9	52 (51)	33 (32)	17 (17)	102
1960-4	51 (52)	23 (23)	25 (25)	99
1965-9	66 (48)	43 (31)	28 (20)	137
1970-4	70 (54)	35 (27)	24 (19)	129
1975-9	50 (46)	36 (33)	22 (20)	108

Discussion

Gastric carcinoma accounts for about 16% of all malignant neoplasms in Norway. It is of extremely poor prognosis. An appreciable decrease has been recorded in its incidence in both sexes and in all age groups.⁶ In Canada the number of deaths from gastric carcinoma dropped by 38% in women and 23% in men between 1970 and 1979.¹⁰ Similar figures have been reported from other countries,¹¹ so that gastric carcinoma is now generally accepted to be declining. In view of the seriousness of the disease this is, potentially, an extremely important observation, not least for epidemiological research.¹² Against this background, that the number of cases of histologically confirmed gastric carcinoma in this district has remained virtually unchanged over the past 25 years relative to the population at risk is disturbing.

The cases in the present necropsy series represent about a fifth of all cases recorded for this district. They account for 28% of the cases that were histologically confirmed, the others also being diagnosed at this institute.

The composition of this necropsy sample varied little over the 25 years. Age and sex distributions were relatively constant, and the distribution of the different histological types of gastric carcinoma was similar. There was thus no evidence of a decrease in the intestinal type as would have been expected from published reports.^{13 14}

The present paper shows that neither the incidence of gastric

carcinoma as seen at necropsy here nor the number of histologically confirmed cases from the district has changed over the 25 years. This leaves the cases without histological confirmation. They are the weakest link in the chain. The present findings show that the postulated difference in incidence over the years lies here.

The number of cases without histological confirmation dropped from 391 in the first five years to 74 in the last. This suggests that the modern clinical diagnostic apparatus built up over these years, which is dependent on morphological confirmation, has to a great extent led to the exclusion of cases that were previously, erroneously, reported as gastric carcinoma. Changes, as shown, have occurred in the age composition of the population and, probably, in the extent to which the increased diagnostic activity has operated in the different age groups. Such discussion is beyond the scope of the present data. The major difference is between the considerable fall in the total number of cases reported and the relatively constant picture in those with histological verification. The decline in this disease reported over the past 25 years could thus well be explained on the basis of increased diagnostic accuracy.

As Barker recently pointed out,¹⁵ there is good reason to view epidemiological findings based on mortality statistics with suspicion as "the death certificate is primarily a legal document, not a record for medical research . . . the accuracy of the diagnostic data is unknown." The present findings serve to underline this warning and emphasise the need for thorough case studies in epidemiological research.

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Interval between insulin injection and eating in relation to blood glucose control in adult diabetics

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Abstract

In a survey of 225 diabetics treated with insulin 24 (10.6%) claimed never to have received advice concerning the interval between insulin injection and eating. Of the remainder, 67 (33%) admitted disregarding advice and using shorter intervals. There was a significant ($p < 0.01$) difference between the reported frequencies of clinical hypoglycaemia in patients using different intervals.

The effects on glucose control of intervals between insulin injection and breakfast of zero, 15, 30, and 45 minutes were studied for periods of one week in 11 patients with type I diabetes who were receiving twice daily injections of monocomponent porcine insulins and high fibre, high carbohydrate diets, using standard home blood glucose monitoring techniques to measure

blood glucose concentrations each morning. The delay of 45 minutes resulted in the lowest frequency of hypoglycaemia and the most acceptable pattern of glucose concentrations measured one and two hours after breakfast and before lunch. Combining results obtained at these three times, the mean increment in blood glucose concentration was smaller after allowing a delay of 45 minutes than after delays of zero ($p < 0.001$), 15 ($p < 0.03$), and 30 (NS) minutes. A delay of 30 minutes resulted in smaller mean increments in blood glucose concentration than did delays of zero ($p < 0.001$) and 15 (NS) minutes.

These results suggest that this aspect of diabetic management may be neglected, with important consequences for blood glucose control. An increase in delay between insulin injection and eating to 45 minutes would be a simple and safe way of improving blood glucose control in at least the 37% of the diabetic population surveyed in this study who currently allow less than 15 minutes.

Introduction

Although the bearing of hyperglycaemia on long term problems in diabetes has been debated,^{1 2} current policy is to aim for blood glucose concentrations that are as near as possible to normal at all times.^{3 4} Diabetic patients agree with this approach, but the use of home monitoring of blood glucose concentrations has highlighted the difficulties of using conventional subcutaneous insulin regimens to control the after breakfast peak in blood

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