Has the character of gastric cancer changed?

A descriptive study of a 10-year period

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Summary

Over the 10-year period January 1976 - December 1985, 446 patients with histologically verified adenocarcinoma of the stomach were treated at Tygerberg Hospital. Coloured patients made up 63,4% of the study population and a significant increase in the annual proportion of this group was observed. Coloured men comprised 47,6% of the total group. The mean age of white and coloured patients differed significantly (68,9 v. 56,5; $P < 0,001$). The symptom complex was essentially similar in the two racial groups and in general the character of the symptoms had no bearing on the prevalence of resection. Although antral tumours were most common in whites and in coloureds, there was a significant increase in tumours located in the fundus in whites. The resection rate remained unchanged over the 10-year period. Only 4 cases of early gastric cancer were detected during this period without any signs of an increased yield of early lesions over time. This audit revealed no beneficial changes over time, which is in stark contrast with reports from Japan regarding the proportion of curable lesions.

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The majority of patients with cancer of the stomach have widespread disease at the time of diagnosis. This well-known bleak outlook may easily lead to a fatalistic approach to the disease, as was expressed by MacDonald and Kotin[1] in 1954. In their pessimistic hypothesis they stated that the outcome of every patient with gastric cancer could not be influenced even by the most determined physician.

The 5-year and 8-year survival of a cohort of 223 patients diagnosed with gastric cancer at Groote Schuur Hospital, Cape Town, with 99,1% complete follow-up, was 8,5% and 7,6% respectively.[2]

However, little doubt remains that surgery does improve survival in patients with limited disease, especially those with early gastric cancer.[3] Emphasis should therefore be placed on epidemiological studies and screening techniques to diagnose these early lesions in high-risk groups.

This descriptive study was undertaken to determine the patient characteristics, symptoms and mode of treatment of patients with gastric cancer seen at Tygerberg Hospital over the 10-year period January 1976 - December 1985.

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Patients and methods

A list of all patients with histologically proven adenocarcinomas of the stomach over the above-mentioned period was obtained from the files of the Department of Pathology. Microfilm records of these individuals were examined by the authors for: (*i*) demographic details; (*ii*) symptomatology at the time of presentation; (*iii*) tumour location; and (*iv*) surgical procedure.

Occupation was classified as professional, skilled, unskilled, unemployed or pensioner. Symptoms noted were: dyspepsia (including epigastric pain); vomiting; haemorrhage (including haematemesis and/or melaena); weight loss; and dysphagia. Surgical procedures were categorised as: resections comprising the Billroth I or II procedures or total gastrectomy; and non-resections comprising gastro-enterostomy, laparotomy only or no surgical intervention at all.

Independent groups were compared using Yates' corrected χ^2 test for categorical data and the two-sample t-test for continuous values.

Results

During the decade under investigation, gastric cancer was histologically confirmed in 446 individuals. Only 11 patients were blacks or Asians. This small group (2,5%) was omitted from further analyses and the study population therefore consisted of 435 patients.

Since information was not complete for all patients, sample size for the various observations did not always consist of 435 individuals.

The admission rate for coloureds and whites varied between 4 and 14 per 10 000 inpatients by race per year. Proportionately, coloureds made up 63,4% of the total group ($P < 0,01$). It was also observed that the annual proportion of coloureds increased over the 10-year period (χ^2 test for trend in binomial proportions; $P = 0,0023$). The male/female ratio for the group as a whole was 2,54:1, for coloureds 3:1 and for whites 1,94:1.

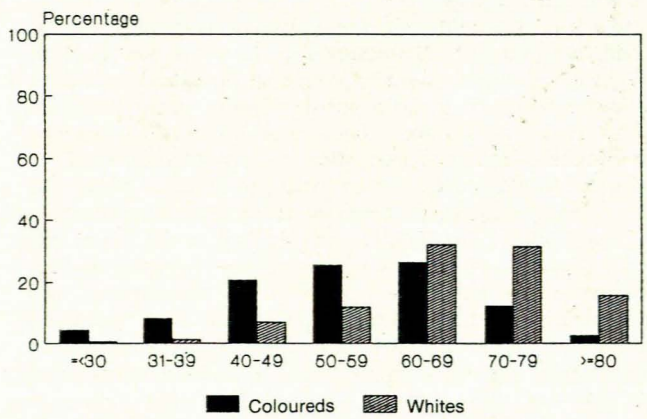

Fig. 1. Proportionate representation by race and age.

TABLE I. MEAN AGE BY SEX AND RACE

	Coloured		White	
	Men	Women	Men	Women
No. (%)	**203 (47,2)**	**69 (16,0)**	**104 (24,2)**	**54 (12,6)**
Mean age (yrs)	**56,9 ± 12,23**	**56,01 ± 15,17**	**68,81 ± 10,97**	**69,00 ± 11,58**

Men predominated (71,7%) ($P < 0,001$) with coloured men (47,6%) constituting almost half of the total study population. In whites the sex ratio by age was constant but varied in the coloured group ($P = 0,005$).

The mean age differed significantly between the two racial groups ($P < 0,001$) (Table I), as did the proportional representation of the various age groups. Coloureds predominated in the below 69-year-old and whites in the above 70-year-old age strata (Fig. 1).

The majority of coloureds were either unskilled or unemployed (64,2%) and the majority of the whites were pensioners (69,9%).

The prevalence of the various symptoms is shown in Fig. 2. The races did not differ significantly in respect of symptoms, with the exception of dyspepsia, which was more common among coloureds (71,0% v. 58,9%; $P = 0,010$). No difference in frequency existed between sexes of the same race.

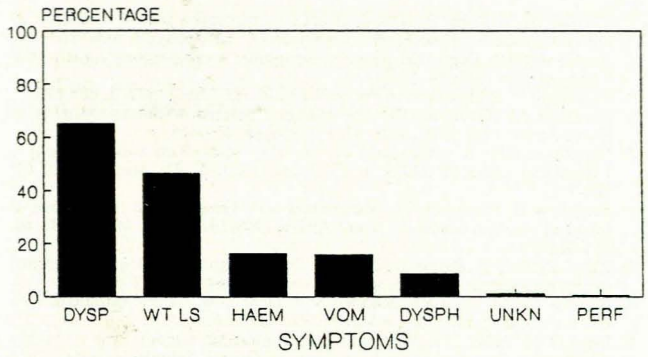

Fig. 2. Prevalence of symptoms for total study group ($N = 434$) (DYSP = dyspepsia, WT LS = weight loss, HAEM = haemorrhage, VOM = vomiting, DYSPH = dysphagia, UNKN = unknown, PERF = perforation).

The two racial groups were similar in respect of the prevalence of tumour location. In tumours restricted to various sites, the antrum was most commonly involved, viz. in 58,9% of the total group, the body of the stomach in 13,4% and the fundus in 10,7%. In the coloured group antral involvement was more common among women (86% v. 73%; $P = 0,035$), but sex had no influence on the prevalence of tumour site in whites.

The proportion of antral lesions remained unchanged over time. However, an increase was perceived in the proportion of fundal lesions in whites (χ^2 test for trend of binomial proportions: $P < 0,001$) (Table II). In addition to this trend, there was a proportional increase in tumours situated in the antrum in coloureds compared with whites (χ^2 test for linear trend of binomial proportions: $0,01 < P < 0,025$). However, this phenomenon is explained by the proportional increase in the number of coloured patients.

The ratio of men and women undergoing the various interventions was homogeneous for both coloureds and whites over time. The proportions of patients by race undergoing resections and non-resections were also homogeneous. Although 62,4% of whites underwent resection of tumours compared with 55,1% of coloureds, this difference was not statistically significant ($P = 0,139$). The character of the symptoms did not determine the prevalence of resection in either race. Resection was, however, negatively associated with the presence of a palpable mass in coloureds ($0,01 < P < 0,025$). For the group as a whole dyspepsia was positively associated with Billroth I or II gastrectomy ($0,01 < P < 0,025$) and dysphagia positively associated with total gastrectomy ($P < 0,001$). Tumour location influenced the proportion of resections performed (Table III). The more proximal the lesion, the fewer resections were done. Bartholomew's test for gradient in proportions for whites and coloureds had a P-value of $< 0,001$ for both groups. The prevalence of resection in the various sex and racial groups during the first and second 5-year periods was similar, with white women being the only exception (76% v. 39%; $0,01 < P < 0,025$).

Of 14 lesions initially thought to be early cancer according to reports of histological examination, only 4 proved to be of such nature after careful review. This gives an overall incidence for true early gastric cancer of 0,92% (4/435). These lesions were diagnosed during 1978, 1980, 1982 and 1985. The patients were 2 coloured men aged 43 years and 52 years, respectively, a coloured woman aged 49 years and a white man aged 47 years.

It should be noted that these results, and any inferences that are to be made, pertain to the study population under investigation only and that deductions cannot be unconditionally extrapolated to the population at large due to the influence of several forms of bias.

TABLE II. PREVALENCE (%) OF FUNDAL TUMOURS IN WHITES

	1976 - 1977	1978 - 1979	1980 - 1981	1982 - 1983	1984 - 1985
Prevalence	**11,0**	**19,0**	**18,0**	**28,0**	**20,0**

TABLE III. PREVALENCE OF RESECTION BY SITE

	Coloured	White
No.	**258**	**151**
Antrum	**45,7%**	**45,0%**
Body	**12,8%**	**13,3%**
Fundus	**3,9%**	**8,0%**

Discussion

In 1949 stomach cancer was the most common cause of cancer death among whites, coloureds and Asians of both sexes in South Africa. By 1969 the rates had dropped in all groups except coloured men, who had the fourth highest incidence in the world. During the following decade the stomach cancer rate among coloured men began to decrease and by 1979 had dropped by nearly 40% compared with the 1969 figure.[4] During the period 1970 - 1980 stomach cancer was the most common cause of cancer death among coloured men but at present it comes second after cancer of the lung. In coloured women it fills the third position.[5]

The incidence of stomach cancer among white South Africans is much the same as in most European countries.[6] The effect of race on the incidence of gastric cancer is pronounced in the RSA. As far back as 1963 it was noted that gastric cancer was several times more common among Cape Coloureds than among blacks.[7] In more recent reports, the predominance of this form of cancer among coloureds has been reaffirmed.[8,9]

In the present study the consistent proportional increase in the share of coloureds over time was conspicuous. Differences in the incidence of gastric cancer in the same geographical area on the basis of ethnicity have also been noticed elsewhere.[10] As admission rate and referral filter bias influence the admission rate of patients with gastric cancer to Tygerberg Hospital, no inference could be made as regards incidence.

Although occupation in whites only reflects the age distribution of cases, the status of coloured cases may be indicative of the socio-economic status of the majority of this group, as determined in this study. This disease has previously been reported to affect the poor rather than the rich.[11,12] The standardised mortality rates for various social classes tend to increase with decreasing levels of skill.[13]

The site in the stomach that is most commonly invaded by adenocarcinoma is the antral area.[14,15] Of particular interest is the recent increase in the incidence of proximally situated lesions among whites.[16] A similar trend was also observed in whites in this study.

The prevalence of the various symptoms varies considerably according to different reports but pain and loss of weight are consistently more common.[17,18] Although the site of tumour involvement seems to influence the quality of the complaint, benign ulcers tend to have a similar symptom complex.[19] The symptom complex in patients with and those without resectable lesions is also alike.[20] Symptomatology therefore plays a questionable part in diagnosing and planning treatment in patients with gastric cancer, as was found in this audit.

Cady *et al.*[21] stated in their report that: 'No progress in the surgical management of this disease has been accomplished since 1950, despite a generally aggressive surgical approach.' Despite an increase in resectability from 28% to 43%, the 4-year survival decreased from 14,0% to 12,4%.[22] This temporal change probably reflects improvement in surgical skill and anaesthetic methods and not a change in behaviour of gastric cancer. No unequivocal increase in the resection rate was observed in our study. In general, no improved survival was achieved despite the earlier presentation, marked increase of use of endoscopy and improved diagnostic accuracy for the period 1950-1980.[16]

In some areas in Japan the 5-year survival rate improved from 10% in 1960 to 45% in 1980 after the introduction of mass screening and the subsequent increase in the yield of early gastric cancer.[23]

The 5-year survival in mass-screened patients is in the order of 50 - 60%, mainly due to the 35 - 45% prevalence of early gastric cancer in that particular cancer population.[24] The findings of our audit are distressing, since no significant progress has been achieved over time as regards the yield of early gastric cancer and thus the incidence of curative resection. The prevalence of early cancer of 3,6% (8/223),[25] as reported by Groote Schuur Hospital, indicates that our experience is not extraordinary. The statement which MacDonald and Kotin[1] made in 1954 is therefore still applicable in our institution.

Cancer of the stomach remains a major cause of cancer death among economically active coloured men of the lower-income group. In view of the progress that has been made by the Japanese in respect of a higher yield of early cancer, a concerted effort is needed to improve the outlook in the target group identified by our study.

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