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GASTRIC CANCER PATIENTS TREATED BY A GENERAL OR GASTRIC CANCER SURGICAL TEAM: a comparative study

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ABSTRACT – ***Background*** - Although gastric cancer has been decreasing in incidence in many countries, it is still the second most common cause of cancer deaths worldwide. Its prognosis is poor and depends, among other factors, on early diagnosis as well as on surgeon expertise. ***Aim*** - To compare the outcomes of gastric cancer patients treated at a university hospital by a general surgical team and later on by a gastric cancer surgical team. ***Methods*** - Gastric cancer patients were separated into two groups according to whether they were treated by a general surgical team (group 1, n = 136; 1984 to 1993) or by gastric cancer team (group 2, n = 149; 1994 to 2003). Clinical and pathologic features and survival rates were assessed. ***Results*** - During a 20-year period, a decreased number of patients underwent surgical resection in the second period (94% vs 86%), a greater number of upper gastrointestinal endoscopies were performed resulting in an increased number of tumors diagnosed as stage I (5% vs 22%). Also, D2 gastrectomies were more frequently performed instead of D0 gastrectomies and negative surgical margins were adequate. Mortality decreased from 9% to 6% in group 1 and 2, respectively and adjuvant therapy has been considered. ***Conclusion*** - Surgical specialized units for gastric cancer are necessary if better results are to be expected since this approach definitely provides better patient care.

HEADINGS – Stomach neoplasms, surgery. Gastrectomy.

INTRODUCTION

Although the incidence of gastric cancer is decreasing in many countries, mainly in developed ones, it continues to be one of the most frequent tumors, when considering both genders, and it is ranked in the fourth position, following lung, breast and colon cancers, representing the second greatest cause of cancer deaths, worldwide. Every year, there are 935,000 new cases, of which 23,000 are diagnosed in Brazil[7, 49, 54].

In southern Brazil, in the state of Rio Grande do Sul the incidence of gastric cancer is the greatest in the country (23/100,000 male inhabitants) and 1,770 new cases are estimated for 2006, according to the National Cancer Institute – INCA[7].

The number of patients with gastric cancer surviving 5 years after diagnosis and who were mainly submitted to surgical treatment has increased over the past few years in western countries[2], especially in specialized gastrointestinal units[17], though this figure remains far below those results obtained by Japanese authors[31]. This is due to the fact that cure or increased survival depends, as in many cancers, on early diagnosis[8]. Toward this purpose, a large amount of financial resources is needed to identify individuals at risk and to select patients who may be generally in an asymptomatic phase leading to, in most cases, diagnosis at an earlier stage and as a consequence contributing to improve overall outcomes, such as operability, resection and survival rates.

The cost/benefit relationship for screening patients with gastric cancer is considerably unfavorable when other Brazilian public health priorities are considered. Therefore, we have been keeping a rate of about 15% of early-diagnosed cases in the country[20, 26], which is quite lower as compared to Japan, for instance, where a rate of 50% or over can be achieved due to a great effort established long ago to search for gastric cancer[31].

However, improvement of those rates is not only achieved by large investments on screening but the establishment of specialized services, such as The Stomach and Small Intestine Surgical Service - SSISS or "Stomach Cancer Groups", allows the referring of cases and, therefore improves quality of surgeons, due to continued practice, increase on experience, knowledge and motivation, all that results in improvement on quality of the services[1].

This paper addresses the results of a 20-year period in the treatment of gastric cancer in a university hospital

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comparing those patients treated in the first half by several general surgeons and in the second half, by a gastric cancer surgeon exclusively.

METHODS

The University Hospital of the Federal University of Santa Maria, RS, Brazil is a regional referring hospital for the 43 cities in central region of the Rio Grande do Sul state, covering a population of 1.5 million inhabitants. Upon its opening in 1984, a General Surgery Service was established, which was responsible for all surgical problems, including gastric cancer. Later, surgical specialty units were established, including Urology, Cardiovascular surgery, Thoracic surgery, Coloproctology, and finally in 1994 Gastrointestinal surgery was divided into Esophageal, Stomach and Small Intestine, Liver, Billiary tract and Pancreas, Hernias and Abdominal Wall units.

When management of the SSISS was taken over, data was collected from the record of all patients with gastric cancer treated by general surgeons (1984 to 1993, first half) and was assembled into a database developed for this purpose and that should be used to store data from gastric cancer patients treated by a gastric cancer surgeon, thereafter. Ten years later (second half, 1994 to 2003), a comparative analysis of the two halves was performed to evaluate the outcome on the quality of treatment obtained before and after the establishment of this specialized unit for gastric cancer.

In the first half there were 136 patients (101 male, 35 female; mean age = 64 years) and in the second half there were 149 patients (96 male, 53 female; mean age = 60 years) and the clinicopathologic characteristics are shown in Table 1.

TABLE 1. Clinicopathologic characteristics

Characteristics	1st period (n = 136)	2nd period n = 149)	*P**
Sex			ns
Male	101 (74%)	96 (64%)	
Female	34 (26%)	53 (36%)	
Age (mean)	63.9	59.7	
Operability	128 (94%)	129 (86%)	0.042
Mortality (resection)	9 (9%)	7 (6%)	ns
Lymphadenectomy			0,0001
D0	87 (85%)	0 (0%)	
D1	16 (15%)	19 (10%)	
D2	0 (0%)	92 (90%)	
PTNM stage			0,0001
I	5 (5%)	22 (22%)	
II	8 (8%)	14 (14%)	
III	27 (26%)	35 (34%)	
IV	63 (61%)	31 (30%)	

* according to the chi-square test

The two periods were compared for patient awareness of the disease, number of upper gastrointestinal endoscopies performed, surgical resection rate, surgical techniques, tumor stages, surgical mortality, adjuvant treatments and follow-up.

Statistical analysis was performed using the chi-square test, with $P<0.05$ considered as significant and a confidence interval of 95%. Survival curve was calculated by Kaplan-Meyer method[30].

RESULTS

In the first period, restricted information about gastric cancer was given to the patient or to family members, sometimes even omitting the real conditions of the patients. On the contrary, in the second half, after the establishment of the SSISS, in addition to full information given to the patients and family members who also took part on surgical decisions, there was thorough information given to the community through brochures, newspaper issues as well as television and radio programs. This approach led to not only an increased number of appointments to the SSISS but also to an increase in the number of upper gastrointestinal endoscopies (Figure 1).

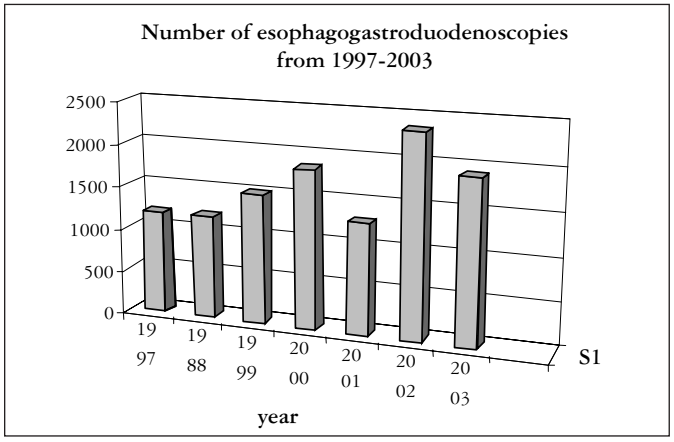

FIGURE 1. Number of high digestive endoscopies carried out at the University Hospital of Santa Maria between 1997 and 2003

During the second period, 149 patients were identified. Twenty (13%) of them presented with far advanced disease and even palliative surgical procedures were not indicated. The remaining 129 patients had undergone gastric resections (n = 102; 79%) diagnostic laparotomies or bypass procedures (n = 27; 21%). Of the 102 resections, 64 (63%) were potentially curative (R0) and 38 (37%) were palliative procedures (R2). There were seven (6,8%) and four (14%) postoperative hospital deaths in the resection and non-resection gastric tumors, respectively. Seventeen (13%) patients were lost to follow-up and 91 were included in the survival curve calculations. The 5-year survival rates were 81%, 43%, 18%, and 0% for stage I through IV, respectively (Figure 2).

As for operability, it was greater in the first period, where it was understood that all gastric cancer patients "deserved" a surgical attempt. However, in the second period, it was lower because a more precise staging assessment, including an accurate clinical and image examination was routinely performed. Recently, laparoscopy was added to determine patients that would not benefit from surgical approach, such as those with metastatic disease and absence of bleeding or obstruction.

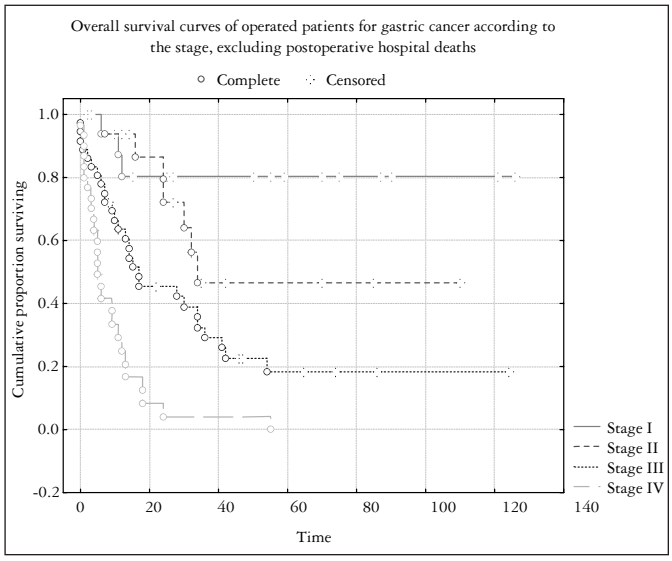

FIGURE 2. Survival curves for TNM stages of patients operated for gastric cancer

When gastric resection was possible on the first period, it was performed without on table assessment of the surgical specimen to confirm safety margins. In addition, oncologically adequate lymph node dissection has not been performed. On the second period, besides observing surgical safety margins, the involved lymph node basins, according to the Japanese Association for Gastric Cancer[27, 28, 40] have been also removed.

As a result of increased demand, which resulted from the increased number of endoscopies, there was an increase in the number of patients with stage I lesions, assessed by the pathologic TNM staging (UICC 1987[23] and 1997[51]) of the surgical specimen (pTNM), when compared to the first period ($P = 0.0001$) (Figure 3).

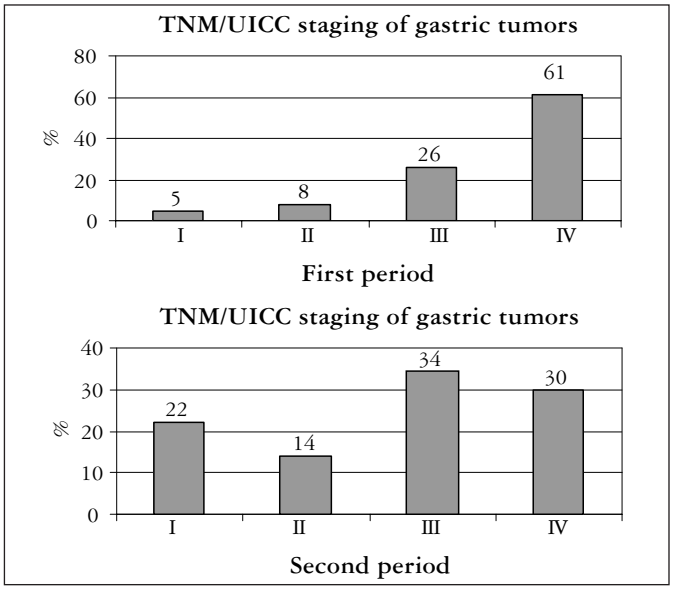

FIGURE 3. Comparison of TNM staging of patients operated for gastric cancer for both periods

By surgical procedures being performed exclusively by the SSISS and with the establishment of pre- and post-operative routines, in-hospital post-operative mortality rates decreased from 9% to 6% and have recently decreased to 3% in the past 3 years.

Patients were followed-up in the SSISS in the out-patient unit. An active search for patients who do not return on follow-up appointments is also performed. Survival curves according to Kaplan-Meier are performed yearly for all disease stages and are presented in Figure 2.

Since January 2004, the SWOG – 9008/INT0116 was adopted as adjuvant treatment for posterior analysis[34].

DISCUSSION

The division of the Digestive Surgery into specific units for specialized treatment of diseases of the esophagus, stomach and small intestine, liver and billiary tract at the University Hospital of Santa Maria, as other similar University Hospitals in Brazil, including the University Hospitals attached to the Universities of São Paulo and Porto Alegre aimed to concentrate the experience of professionals in these fields and, with time, to increase expertise, skills and to establish appropriate actions to be used and discussed with other experts in the field. The aim of this analysis was to confirm whether the reduction in the area of expertise of these professionals is balanced by the expansion of knowledge of their specific field and whether this results in a real benefit for patients. It is well defined among many authors that the more surgical volume a surgeon has, the lower the rate of mortality and of complications[3, 18, 44]. Furthermore, specialized units also present this gap when compared to non-specialized units. McCULLOCH[36] reported a mortality rate of 16% and a morbidity rate of 49% in gastric resections for cancer in a general hospital, emphasizing the need to concentrate experience in order to improve these results.

Looking for information from the patient point of view, we have participated for 10 years in a gastric cancer patient website (http://www.acor.org/stomach-onc.html), and have been able to observe a number of doubts about the disease and difficulties with treatment. Access to the internet is still restricted in Brazil, mainly among the poor population and, therefore, it is necessary to spread information through other ways. Both types of publicity brought together a group of patients who sought appointments at the SSISS. After complaints and rigorous physical examination, patients were selected for an upper gastrointestinal endoscopic examination based on the following criteria: patients of both sexes 45 years old or over with epigastric pain or dyspepsia, mainly when combined with appetite or weight loss, decreased hemoglobin, history of low intake of fruits and vegetables and a high intake of salty or smoked meat, or family history of first degree relatives with gastric cancer. CHRISTIE et al.[10] stated that this approach can only be justified for patients with uncomplicated dyspepsia over 55 years old. Obviously, patients with signs suggestive of disseminated disease, such as ascites, Blummer's sign, palpable

lymph nodes such as Virchow's or sister Mary Joseph's and nodular liver enlargement were also selected for an upper gastrointestinal endoscopy.

This assessment resulted in a great number of patients with an endoscopic diagnosis of normal findings or benign diseases. However, it also provides an increase from 5% to 22%, of patients with stage I gastric cancer. Although stage I by no means signifies early cancer, based on the IB group from the 1997 UICC classification, it is certainly associated with a better prognosis. This same result has already been reported, both by the Japanese authors and SUE-LING et al.[52] and, likewise, are based on a greater number of upper gastrointestinal endoscopies. Nevertheless, this results in a higher cost, only justifiable, according to CORREA et al.[11], in regions with a high incidence of gastric cancer. PARKIN et al.[45] estimated that to detect one case of gastric cancer, 2,877 male patients over the age of 45 would have to be examined in countries with a low incidence of gastric cancer, such as the United States, whereas it would only be necessary to examine 253 patients with the same characteristics in a country with high incidence, such as Japan. In the southern region of Brazil, there is an intermediate incidence there are no studies regarding the cost/benefit relation to these cases.

As for operability, we believe that all patients that could be submitted to potentially curative surgery, i.e., locally advanced disease suitable for complete resection (R0), should undergo laparotomy. Unfortunately, this occurs in 15% to 64% of cases submitted to surgery[15, 36, 47]. This means that pre-operative staging should be as rigorous as possible in order to thoroughly define patients with diffuse or unresectable disease. Our rate of operability is still high (86%), similar to other important series published until the 90's[2], though it has decreased since the second half of the second period when laparoscopy assessment was added as part of the staging, thereby coming closer to more recent series[39, 53]. This is because laparoscopy can assess peritoneal implants that are difficult to detect in routine imaging exams and, in such cases, precludes palliative surgery[24, 35], leading to complementary procedures, such as neo-adjuvant chemotherapy[9, 32, 33, 43, 46].

There are many supporters of palliative resections, mainly in the case of tumor bleeding or gastric obstruction[25, 42], which are not indications for laparoscopy as a staging tool[35].

It can be clearly observed a progress in our in-hospital mortality rate following gastric resection comparing the first with the second period, which is within the acceptable range, i.e., between 2% and 13%, and almost reaching the lowest ones[6, 13, 14, 19, 22, 38, 41, 50, 55] As for surgical procedures, lack of observation of surgical margins is a deterrent factor that may significantly shorten patient perspective of survival[53] and as much as possible a 6 cm margin of resection should be attempted.

The D2 lymphadenectomy was adopted as routine, according to "Associação Brasileira do Câncer Gástrico"[16] and Japanese Gastric Cancer Association[29,48] recommendations. Although the extensive review recently performed by McCULLOCH et al.[37] has concluded that D2 dissection is not beneficial there is a favorable trend in the T3+ group that similarly accounts for the majority of our patients. The two random, and already acclaimed studies, that warn on the increased morbidity and mortality rates of the procedure[4, 5, 12, 13], point out splenectomy and distal pancreatectomy as routine procedures, which seems to be unnecessary[37], unless in the case of direct invasion of the tumor; combined splenectomy is performed among us only in the evidence of direct invasion or uncountable splenic art. lymph nodes are involved. Pancreatectomy is considered an exception and it is also only used in cases of direct invasion, since in most cases, it is possible to dissect group 11 lymph nodes without resection of the distal pancreas[48].

As for combined treatment, mainly adjuvant, in the first period, it was believed that there was no benefit for patients, with a very low response rate and a high morbidity rate[43]. Later, with the development of new drugs and the published results by MacDONALD et al.[34], the SWOG 9008/INT 0116 protocol was adopted to assess patients undergoing D2 gastrectomy. There are many studies and protocols testing new drugs, some of them using drugs given by mouth, which stimulates the use of neoadjuvant regimens and leads to downstaging in stage IV tumors allowing further curative surgery[21, 25, 33, 42].

All these strategies for treating gastric cancer patients are only possible if patients are adequately followed-up. For this reason, in the second period, the majority of our patients were followed-up and survival curves were annually assessed to observe outcome in detail.

In conclusion, we believe that the creation of specialized surgical units, such as the SSISS of the University Hospital of Santa Maria for the treatment of gastric cancer has brought unquestionable benefits when compared to the non specialized service running before, and is a policy that should be stimulated with the goal of attempting better quality in health care for the population.

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Souza FO, Pereira DV, Santos LH, Antunes L, Chiesa J. Estudo comparativo entre cirurgia geral e cirurgia especializada no tratamento de pacientes com câncer gástrico. Arq Gastroenterol. 2008;45(1):28-33.

RESUMO – ***Racional*** - Embora a incidência de câncer gástrico esteja diminuindo em muitos países, ainda é a segunda causa de morte por câncer mundialmente. O prognóstico desta doença é reservado e depende, entre outros fatores, do diagnóstico precoce e da experiência da equipe cirúrgica. ***Objetivo*** - Comparar os resultados obtidos no tratamento de pacientes com câncer gástrico em um hospital universitário, inicialmente por uma equipe de cirurgia geral e posteriormente por outra especializada no tratamento dessa doença. ***Métodos*** - Os pacientes foram cronologicamente divididos em dois grupos: o primeiro tratado pela cirurgia geral (grupo 1, n = 136, 1984-1993) e o segundo pela equipe de cirurgia gástrica (grupo 2, n = 149, 1994-2003). As características clínicas e patológicas e as taxas de sobrevida foram avaliadas. ***Resultados*** - Durante um período de 20 anos de tratamento, menor número de pacientes foi submetido a cirurgia no segundo período (94% vs 86%), foram realizadas mais endoscopias digestivas altas no segundo período, resultando em maior número de tumores em estágio I (5% vs 22%). Também as gastrectomias D2 foram mais realizadas e as margens de segurança cirúrgicas respeitadas. A mortalidade cirúrgica diminuiu de 9% para 6%, e tratamentos complementares como radio e quimioterapia adjuvantes foram realizados no segundo período. ***Conclusão*** - Equipes cirúrgicas especializadas são necessárias para a obtenção de melhores resultados no tratamento de pacientes com câncer gástrico.

DESCRITORES – Neoplasias gástricas, cirurgia. Gastrectomia.

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