

Survival of patients with stomach cancer in Changle city of China

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Abstract

AIM: The survival rate of patients with stomach cancer is used to evaluate the effects of treatments. The short- and mid-term survival of patients on the present level of treatments can be described by calculating 1- to 5-year survival rates. The aims of this study were to document patterns of survival after treatments for stomach cancer in Changle city and analyze whether the stage of cancer and the way of treatment impacted on survival of patients or not.

METHODS: A total number of 745 patients with stomach cancer reported in the Changle Cancer Registry from 1993 to 1998 were investigated with respect to the disease condition, the way of treatment and survival time. 1- to 5-year survival rates were estimated by using life-table method.

RESULTS: The 1- to 5-year survival rates in the patients with stomach cancer in Changle city were 54.23%, 41.77%, 37.95%, 33.98% and 30.47%, respectively. The 1- to 5-year survival rates in stagel or II group were 3, 6.1, 7.4, 8.9 and 9.8 times as high as those in stage III or IV group, respectively. The 1- to 5-year survival rates in operation group were 3.5, 8.7, 11.2, 11.7 and 19 times as high as those in no operation group, respectively. For the patients with stage III or IV stomach cancer the 1-year survival rate in operation group was 3 times as high as that in no operation group and 2-year survival rate in operation group was 11.9 times as high as that in no operation group. For the patients with stage III or IV stomach cancer, the differences of the survival rates average survival times between total gastrectomy and partial gastrectomy were not significant and the median survival times in these 2 groups were 8 mo and 9 mo, respectively.

CONCLUSION: Mid-term survival rates of patients with stomach cancer in Changle city are low. Stage of cancer is an important factor influencing survival of patients with stomach cancer. Surgery is an effective treatment for the patients with stage IV cancer and can raise short- and mid-term survival rates. Total gastrectomy should not be encouraged for the patients with late stage of cancer.

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INTRODUCTION

The survival time is used to evaluate the effects of treatments for stomach cancer. The survival rates are calculated in the analysis for the survival time^[1]. Many studies have been conducted on the survival analysis of stomach cancer in recent several decades^[2-8]. The survival of patients with stomach cancer was influenced by the stage of cancer and the way of treatment^[8,9]. Since stomach cancer often was not detected until an advanced state, survival rate was rather low. Only a few patients diagnosed with stomach cancer survive five years or more after diagnosis. There is a higher incidence rate of stomach cancer in Changle city of Fujian Province. To study the survival rates of the patients with stomach cancer and the prognostic factors in Changle city, we investigated the survival time of the patients with stomach cancer diagnosed from 1993 to 1998 and registered in the Changle Cancer Registry. The contents of our research were: (1) to estimate the survival rates of the patients with different stages of cancer and to compare these survival rates; (2) to estimate the survival rates of the patients with different ways of treatments and to compare these survival rates; (3) to analyze the survival benefit of the operation on the patients with stage IV stomach cancer; and (4) To make a comparison of survival between the patients with total gastrectomy and partial gastrectomy of stage IV stomach cancer.

MATERIALS AND METHODS

Materials

There were 747 patients with stomach cancer reported in Changle Cancer Registry from 1993 to 1998. Since two patients had no information of survival, the study sample consisted of 745 patients aged from 28 to 85 at registration. There were 593 male with age (60.1±10.1) years and 152 female with age (62.1±11.4) years in our sample. There were 473 dead patients and 272 patients were still alive during the term of investigation with the age (58.4±9.9).

Methods

The survival times of the 745 patients were obtained by visiting their home. After informed consent was obtained from each patient's family, the stage of cancer at diagnosis and way of treatment for the patient were obtained from the patient's medical record. The cause of death for each dead patient with stomach cancer was identified in the Hospital of Changle. The survival times of the patients who were not died of gastric cancer were not included in the data.

The proportion of stomach cancer patients surviving for one, two, three and five years can be a measure of the effect of treatments. The total survival rates by the stage of cancer and surgery were calculated and analyzed by Chi-square (χ^2 test) statistics. Survival analyses were performed by the life-table method^[1]. The data were analyzed using the SAS 8.2 software.

RESULTS

The 1-, 2-, 3-, 4- and 5-year survival rates and their 95% confidence intervals (CI) were estimated using life-table method (Table 1). Table 1 shows that the 1-year survival rate is 54.2% and the 5-year survival rate is 30.5%.

Table 1 Survival rates using life-table method

Time(yr)	Survival rate	95% confidence interval
1	0.542	0.506-0.578
2	0.418	0.382-0.454
3	0.379	0.343-0.416
4	0.340	0.302-0.377
5	0.305	0.265-0.345

The survival rates by the stage of cancer

The stages of cancer and survival status of 745 patients are shown in Table 2. The patients with stage III or IV cancer had 66.67% total survival rate. There were significance differences between these four total survival rates ($\chi^2=353.76$, $P<0.0001$).

A total number of 745 patients were grouped according to their stages of cancer. One group consisted of the patients with stage I or stage II stomach cancer and the other group consisted of the patients with stage III or stage IV stomach cancer. The survival rates using life-table method in two groups are shown in Table 3. The 1-, 2-, 3-, 4- and 5-year survival rates in stage I or stage II group were 3, 6.1, 7.4, 8.9 and 9.8 times higher than those in stage III or IV group, respectively. The difference of the distributions of survival times between the two groups was significant since the two 95% confidence intervals at each year did not overlap.

Table 2 Total survival rates by stage of cancer

Stage of cancer	Number of patients	Patients alive (n)	Death patients (n)	Total survival rate(%)
I	120	115	5	95.83
II	120	80	40	66.67
III	121	42	79	34.71
IV	384	35	349	9.11

Table 3 Survival rates using life-table method by stage of cancer

Time (yr)	Stage I or II		Stage III or IV	
	Survival rate	95% confidence interval	Survival rate	95% confidence interval
1	1.000	-	0.324	0.283-0.365
2	0.955	0.929-0.982	0.156	0.124-0.189
3	0.899	0.857-0.940	0.122	0.090-0.154
4	0.820	0.763-0.877	0.092	0.057-0.127
5	0.739	0.665-0.813	0.075	0.034-0.117

Table 4 Survival rates of surgical and non-surgical patients using life-table method by surgery

Time (yr)	Operation		No operation	
	Survival rate	95% confidence interval	Survival rate	95% confidence interval
1	0.753	0.713-0.793	0.217	0.170-0.265
2	0.639	0.594-0.684	0.074	0.043-0.105
3	0.589	0.541-0.636	0.053	0.024-0.081
4	0.528	0.477-0.580	0.045	0.017-0.073
5	0.478	0.420-0.535	0.025	0.013-0.051

The survival rates of patients with and without surgery

A total number of 745 patients were divided into 2 groups according to the way of treatments. One group consisted of 453 patients who underwent operation with total survival rate 55.63% (252/453) and the other group consisted of 292 patients who had no operation with total survival rate 6.85% (20/292). The

difference of the total survival rates between the two groups was significant ($\chi^2=182.26$, $P<0.0001$). The survival rates using life-table method in 2 groups are shown in Table 4. The 1-, 2-, 3-, 4- and 5-year survival rates in operation group were 3.5, 8.7, 11.2, 11.7 and 19 times as high as those in no operation group, respectively. The difference of the distributions of survival times between these two groups was significant.

The survival of the patients with late stage of cancer with and without surgery

A total number of 505 patients with stage III or IV stomach cancer were divided into two groups according to the way of treatments. One group consisted of 230 patients who underwent the gastrectomy operations and the other group consisted of 275 patients who had no operation. The survival rates using life-table method in the two groups are shown in Table 5. The 1-year and 2-year survival rates in operation group were 3 times and 11.9 times as high as those in no operation group, respectively. It was obvious that the survival times of the patients undergone the operation were longer than those of the patients not operated.

A total number of 145 (37.76%) patients with stage IV stomach cancer had gastric resection and 239 (62.24%) were not subjected to surgery. The 1-year survival rates in the 2 groups of patients with stage IV stomach cancer were 0.244 (95% CI 0.173-0.315) and 0.063 (95% CI 0.032-0.094), respectively. The averages of survival times in the two groups of the patients were 13.3 mo (95% CI 11.03-15.57) and 6.1 mo (95% CI 5.64-6.56), respectively. Median survival times in these 2 groups of the patients were 8 mo and 6 mo, respectively. The 1- and 2-year survival rates were significantly higher in operated patients than no operated patients. However, the average of survival time in operated patients prolonged only for 7.2 mo.

Table 5 Survival rates of surgical and non-surgical patients with stage III or IV stomach cancer using life-table method by surgery for patients

Time(yr)	Operation		No Operation	
	Survival rate	95% confidence interval	Survival rate	95% confidence interval
1	0.511	0.446-0.576	0.168	0.124-0.213
2	0.314	0.251-0.376	0.026	0.007-0.046
3	0.252	0.189-0.315	0.000	-
4	0.202	0.130-0.274	0.000	-
5	0.165	0.078-0.253	0.000	-

The survival of the patients with late stage of cancer by way of operation

Of 230 operated patients with late stage of cancer, 85 (36.96%) patients were with stage III cancer. There were 106 (46.09%) patients had total gastrectomy, 89 (38.70%) had partial gastrectomy and 20 (8.70%) had nonresectional surgery. The survival rates using life-table method in both total gastrectomy and partial gastrectomy are shown in Table 6. The averages of survival times and their 95% confidence intervals are shown in Table 7.

Table 6 Survival rates using life-table method by the way of operation for patients with stage III or IV stomach cancer

Time(yr)	Total gastrectomy		Partial gastrectomy	
	Survival rate	95% CI	Survival rate	95% CI
1	0.536	0.451-0.627	0.571	0.466-0.677
2	0.289	0.207-0.370	0.416	0.306-0.526

The 95% confidence interval for both the 1-year survival rate and 2-year survival rate in total gastrectomy group and those in partial gastrectomy group overlapped. These indicated that all the differences of the survival rates (both 1- and 2-year survival rates) between total gastrectomy group and partial gastrectomy group were not significant. Also, the 95% confidence interval for average of survival time in total gastrectomy group and that in partial gastrectomy group overlapped. This indicated that the difference of survival times between total gastrectomy group and partial gastrectomy group was not significant.

Table 7 Average of survival time by the way of operation in the patients with stage III or IV stomach cancer

Way of operation	Number of patients	Average of survival time (mo)	95% confidence interval
Total Gastrectomy	106	19.56	16.408-22.712
Partial Gastrectomy	89	16.42	14.300-18.540
Nonresectional Surgery	20	5.22	3.84-6.60

Of 145 operated patients with stage IV stomach cancer, 89(61.38%) were subjected to total gastrectomy and 41(28.28%) had partial gastrectomy. The 1-year survival rates in total gastrectomy and in partial gastrectomy were 0.1846(95% *CI* 0.0903-0.2789) and 0.2911(95% *CI* 0.1478-0.4344), respectively. The averages of survival times in total gastrectomy and in partial gastrectomy were 12.36 mo (95% *CI* 9.37-15.350) and 9.28 mo (95% *CI* 8.10-10.46), respectively. Median survival times in total gastrectomy and in partial gastrectomy were 8 mo and 9 mo, respectively. The result showed that prognosis of the patients with total gastrectomy was not better than that with partial gastrectomy.

DISCUSSION

Compared to other tumors, stomach cancer has a dismal prognosis and a low 5-year survival rate. In our research, 5-year survival rate of patients with stomach cancer in Changle city is 30.47%, which close to the results of some previous researches^[7,8,14].

The stage of cancer is the most important independent prognostic factor^[5,8-11]. The results using COX model in some researches showed that the death hazard of the patients with stage III cancer was 2.82 time as high as that of the patients with stage II cancer, and that with stage IV was 3.29 times as high as that with stage II cancer^[5]. The 1- and 2-year survival rates in stage IV stomach cancer were 1.65 and 10 times as high as those in stage III cancer respectively^[12]. The 5-year survival rate in stage I-stage IV were 81.2%, 50.4%, 24.4% and 5.2%, respectively^[7]. Our research also showed that stage of cancer might make a notable impact on survival rate of stomach cancer and 1- to 5- year survival rates in stage I or II of cancer were higher than those in stage III or IV. Among the patients in our study, 94% of the patients visited the doctors after they had had the symptoms of stomach cancer, so 51.54% of the patients had late stage of cancer (stage IV). Only 1.6% of the patients were discovered tumor by the general check up, and they had long survival times since they were diagnosed at early stage. So, researching on how to discover stomach cancer at early stage must play an important role in preventing and curing of tumors.

Surgery provides the only possibility of cure in stomach cancer patients. The 1- and 2-year survival rates of operated patients were much higher than those of not operated patients^[12-16]. Our results also confirmed this. However, whether resection should be performed in patients with the stage IV stomach cancer is still a question^[12,17,18]. Some researchers suggested that surgery could raise 3-year survival rate of patients

with stage IV cancer only if tumors were not diffusely infiltrative type, while short-term survival rates could not be raised even though resections were conducted for the patients with diffusely infiltrative type of cancer^[19]. However, surgery did not prolong survival time in patients with peritoneal dissemination, hepatic metastasis, lymph node involvement and invasion to adjacent organs or with 3 of these 4 factors^[12,20]. Some other researchers suggested that short-term improvement in survival for resected patients with distant metastases could be obtained and resectional surgery should be undertaken whenever possible in patients with stage IV stomach cancer as both short-term and long-term survival advantages had been demonstrated^[12,21-23]. We suggest that surgery not only can raise 1-year survival rate for the patients with stage IV cancer, but also can make them have the possibility of survival for more than 2 years, however, the average of survival time in operated patients with stage IV cancer does not prolong much.

Some researchers suggested that total gastrectomy had a lower relapsing rate than partial gastrectomy, so it could raise long-term survival^[12,14,24]. To improve long-term therapeutic effects, total gastrectomy should be recommended for stage III patients with cancer of the cardia and stomach fundus when tumor size is bigger than 3.0 cm or lymph node metastasis occur^[22]. Some researches also showed that subtotal and total gastrectomies had a similar postoperative complication rate and surgical outcome, and total gastrectomies had benefits of survival prolongation and symptomatic palliation^[23,25,26]. However, other researchers suggested that total gastrectomy could not get a higher survival rate than partial gastrectomy, but carried a higher postoperative complications rate and poorer quality of life than partial resections^[8,27-33]. We suggest that although surgery can raise 1-year survival rate of patients with stage IV cancer, total gastrectomy does not get a better survival than partial gastrectomy for the patients with stage IV stomach cancer. Besides, result obtained from earlier stage research also showed that the quality of life in the patients with total gastrectomy was worse than those with partial gastrectomy.

In summary, our data obtained by epidemiological survey have shown that mid-term survival rates of patients with stomach cancer in Changle city are low. Stage of cancer is an important factor influencing survival of patients with stomach cancer. Surgery is an effective treatment for the patients with stage IV cancer and can raise short- and mid-term survival rates. Total gastrectomy should not be encouraged for the patients with late stage of cancer.

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