

SURVIVAL TREND IN GASTROENTEROLOGICAL MALIGNANCY: A HOSPITAL BASED STUDY

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Abstract

Background : Gastroenterological malignancies represent one of the greatest public health issues worldwide leading to significant numbers of global death. This study was performed to evaluate survival trend that is still alive in patient with GI malignancies from diagnosis to post treatment era with both definitive and palliative care.

Materials and methods: This observational prospective study done at BSMMU and different hospitals in Dhaka city admitted patient with gastrointestinal malignancies during the period of 20th October 2008 to 30th April 2010 getting definitive and palliative treatment. The data were analyzed by simple frequency distribution table.

Results: The most common cancers were carcinoma stomach, hepatocellular carcinoma and colonic carcinoma among total 350 diagnosed cancer patients and were followed up for mean period 6.7 months (± 5.5). Among them 138 (39.4%) patients were alive and 212 (60.6%) were expired during study period. Patient's receiving curative or palliative treatment, 38.5% survived for less than 3 months, 23.1% for 4 to 6 months, 12.6% for 7 to 9 months, 3% for 10 to 12 months, 14.6% for 14 to 24 months and only 5.1% for more than 24 months. Only 18% (63) patients received curative treatment whereas 82% (287) patients palliative treatment. Out of 63 patients, 31.7% (20), 22.2% (14) and 9.5% (6) patients received curative treatment survived more than 24 months, 13-20 months

and 10-12 months respectively whereas only 6.3% (4) patients survived only 3 months. Out of 287 patients, 45.6% (131), 73% (25.4), 11.5% (33) and 10.8% (31) patients received palliative treatment survived less than 3 months, 4-6 months, 7-9 months and 13-24 months respectively whereas only 4.1% (4) patients survived only 24 months.

Conclusion: We observed to estimate the survival trend and the impact of available treatment modalities as well as to determine the outcome for different gastrointestinal malignancies in Bangladesh.

Key words

Gastroenterological malignancy; Survival trend; Curative; Palliative treatment.

Introduction

Cancer may be regarded as a group of diseases characterized by an abnormal growth of cells, ability to invade adjacent tissues and even distant organs and eventual death of the affected patients if the tumor had progressed beyond that stage when it can be successfully removed. At beginning of the 20th century cancer was the sixth causes of death in the industrial country, today it is the second leading cause of death¹.

Cancer can occur at any site or tissue of the body and may involve any type of cell. When cancer cell multiply and reach a critical size, the cancers is evident. As disease advances, symptoms and signs of invasion and distal metastasis becomes clinically apparent².

The priority of the patient management after diagnosis is established and to share patients is to determine the extent of the disease. The extent of the disease is evaluated by of invasive and noninvasive tests and procedure. Increasing biological factors are being related to prognosis. The expression of particular oncogenes, apoptosis related genes, drug resistant genes are involved in metastasis and are being found to influence survival³.

Progress in diagnosis and treatment has had an significant effect on survival of the cancer patients⁴. The development of cancer is associated

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with a fundamental genetic change within the cell and there is over whelming evidence that mutations can cause cancer, a mutation being defined as a change in the genome⁵.

Gastrointestinal tract is the most common site for malignancy and gastroenterological malignancy is the second most common cause of cancer related mortality in the united states³.

The most occurred malignancy in gastroenterology are colorectal cancer, carcinoma pancreas, hepatocellular carcinoma, carcinoma oesophagus, carcinoma stomach and cholangiocarcinoma. In USA incidence of malignancy involving oesophagus, stomach, colon, rectum, liver, gallbladder and pancreas are 4.6, 8, 36.6, 14, 5.9, 1.2, 11.5 per 100000 people respectively⁶. In our neighboring country India, the incidence of colorectal cancer is low in Mumbai compared with developed countries, it comprises 5.7% of male and 4.1% of female cancers, with an average annual age standardized incidence rates of 7.6/100000 in males and 5.7/100000 in females during 1988-1992⁷.

In USA, 5 years survival rates were 15.8% for carcinoma oesophagus, 24.7% for the carcinoma stomach, 63.9% for carcinoma colon, 65.6% for carcinoma rectum, 12.3% for hepatocellular carcinoma, 14.9% carcinoma gall bladder and 5.1% for carcinoma pancreas⁶. But in India 5 years relative survival rates were 11.8% for carcinoma oesophagus, 10.1% for the carcinoma stomach, 4.1% for carcinoma pancreas, 42.2% for carcinoma rectum and 36.6% for carcinoma colon⁸. Hepatoceellular carcinoma is rapidly fatal with 5 years survival around 5% in most countries⁹.

Survival from gastroenterological malignancy varies from country to country. This variation is explained by a number of factors including differences in the quality of cancer treatment facilities, in screening programmes, in evidence based best practice guidelines, in facilities for radiotherapy and in access to new anti-cancer drugs.

There is no population based cancer incidence and survival data in Bangladesh. In Bangladesh, most of the gastroenterological malignancies are diagnosed at the advanced stage due to lack of screening programme, unavailability of modern equipments and delay in medical consultation due to poor socioeconomic condition. As a result significant number of patients present to clinician at the stage which is beyond the scope of curative modalities of treatment. Moreover palliative measures also can't be afforded by many patients. Therefore it has been assumed that majority of the patients of gastroenterological cancers in Bangladesh die earlier than expected.

In this study, our attempt is to observe survival rate of patients with gastroenterological malignancy and also see the variable outcome of these malignancies according to different modalities of treatment received by the patients.

Materials and methods

This observational prospective study done at BSMMU (Bangabandhu Sheikh Medical University) and different hospitals in Dhaka city admitted patient with gastrointestinal malignancies during the period of 20th October 2008 to 30th April 2010 getting definitive and palliative treatment. 350 patients were included in this study. The subjects were patients diagnosed cases of cancer involving gastrointestinal tract (Oesophagus, stomach, small intestine, liver, pancreas, hepatobiliary system, colon, gastrointestinal lymphoma, intra-abdominal malignancy with unknown primary). Patient with primary malignancy other than gastrointestinal tract but metastasis to gastrointestinal tract and having other co-morbidities were excluded from this study.

All patients were interviewed after giving consent by using structured questionnaires, through physical examinations and all relevant investigations were done. Treatment modalities were scrutinized, reviewed and then was recorded. All patients or their family members were contacted by using cell phone bi weekly to know the condition of the patients. If patient died, date of death was collected from family members of the patient. The data were analyzed by SPSS program and simple frequency distribution table.

Results

There were 350 gastroenterological cancers patients included in this study. Among all, 238 patients were male (68%) and 112 patients were female (32%), out of which most patients were aged 20-70 years (Table I).

Table I : Demography of gastroenterological cancers patients.

Variable	Total
Total Number	350
Age	
≤20 Years	06
21-30 Years	40
31-40 Years	56
41-50 Years	72
51-60 Years	85
61-70 Years	66
71-70 Years	25
Gender	
Male	238 (68%)
Female	112 (32%)

Most gastroenterological cancers appeared at the age of 51-60 years of age followed by 41-50 years of age (Table II).

Table II : Age distribution of different gastroenterological malignancy (n=350).

Site of cancer	≤20	21-30	31-40	41-50	51-60	61-70	>70
Oesophagus	0	0	4	9	9	7	4
Stomach	0	7	9	17	21	17	6
Duodenum	0	1	0	1	2	4	0
Liver	1	7	9	14	16	11	2
Ampullary	0	1	3	2	4	2	0
Pancreas	0	3	5	6	7	7	7
Bile duct	0	2	5	3	5	2	2
Gallbladder	0	0	2	7	3	4	1
Colon	1	10	10	10	13	7	3
GI Lymphoma	4	5	3	2	4	0	0
Unknown	0	4	6	1	1	5	0
Total	6	40	56	72	85	66	25

The most prevalent gastroenterological cancers were carcinoma stomach (22%) followed by hepatocellular carcinoma (17.1%), carcinoma colon (15.4%), carcinoma pancreas (10%), carcinoma oesophagus (9.4%), carcinoma bile duct (5.4%) and carcinoma gall bladder (4.9%), gastroenterological lymphoma (5.1%), gastroenterological cancers with unknown origin (4.9%) and carcinoma duodenum (2.2%) (Table III).

Table III : Site specific distribution of cancer patients according to outcome (n=350).

Site of the cancer	Total n=350(%)	Alive n=138(%)	Expired n=212(%)
Oesophagus	33 (9.4)	11 (8.0)	22 (10.4)
Stomach	77 (22)	32 (23.2)	45 (21.2)
Duodenum	8 (2.2)	0	8 (3.8)
Liver	60 (17.1)	12 (8.7)	48 (22.6)
Ampullary	12 (3.4)	6 (4.3)	6 (2.8)
Pancreas	35 (10)	9 (6.5)	26 (12.3)
Bile duct	19 (5.4)	7 (5.1)	12 (5.7)
Gallbladder	17 (4.9)	2 (1.4)	15 (7.1)
Colon	5 (15.4)	41 (29.7)	13 (6.1)
GI Lymphoma	18 (5.1)	3 (9.4)	5 (2.4)
Unknown	17 (4.9)	5 (3.6)	12 (5.7)

Among 350 patients, only 63 (18%) got curative treatment. Rest 287 patients (82%) got different palliative measure for their cancers. All cancers patients were followed up for a mean period 6.7 months (± 5.5). Among them 138 (39.4%) patients were still alive and 212 (60.6%) expired. Among

the total 350 patients 38.5% survived for less than 3 months, 23.1% 4 to 6 months, 12.6% 7 to 9 months, 3% 10 to 12 months, 14.6% 13 to 24 months. About 5.1% patients survived for more than 24 months. The expired patients 55.2% survived for less than 3 months, 20.3% 4 to 6 months, 9.4% 7 to 9 months, 3.3% 10 to 12 months and 9.9% 13 to 24 months. Only 1.9% survived for more than 24 months (Table IV).

Table IV : Outcome of the patients during the follow up period (n=350).

Survival period	Total n=350 (%)	Alive n=138 (%)	Expired n=212 (%)
≤3 Months	135 (38.5)	18 (13.0)	117 (55.2)
4-6 Months	81 (23.1)	38 (27.5)	43 (20.3)
7-9 Months	44 (12.6)	24 (17.4)	20 (9.4)
10-12 Months	21 (3.0)	14 (10.1)	7 (3.3)
13-24 Months	51 (14.6)	30 (21.7)	21 (9.9)
More than 24 Months	18 (5.1)	14 (10.1)	4 (1.9)

Among 350 patients overall median survival of gastroenterological cancers were more in ampullary carcinoma (12 months) followed by gastroenterological lymphoma (10 months) carcinoma colon (9 months) and carcinoma oesophagus (6 months). Median survival of ampullary carcinoma patients were 24 months with curative treatment whereas 18 months, 13 months, 12 months and 9 months of median survival of carcinoma oesophagus, carcinoma stomach, lymphoma and carcinoma colon respectively. 8 months median survival of carcinoma colon with palliative treatment whereas carcinoma oesophagus patients median survival were 6 months (Table V).

Table V : The median survival of the study patients (In months).

Site of the cancer	Overall	Curative treatment	Palliative treatment
Oesophagus	6	18	6
Stomach	5	13	4
Duodenum	5	-	5
Liver	3	-	3
Ampullary	12	27	4
Pancreas	3	-	3
Bile duct	4	-	4
Gallbladder	3	-	3
Colon	9	9	8
Lymphoma	10	12	4
Unknown	5	-	5
In all site	5	13	4

Discussion

Gastrointestinal tract is the most common site for malignancy and second most common cause of cancer related mortality in united States³. The most occurred malignancy in gastroenterology are colorectal cancer, carcinoma pancreas, hepatocellular carcinoma, carcinoma oesophagus, carcinoma stomach and cholangiocarcinoma.

In Bangladesh there is no cancer registry, no available cancer registry as well as none has prevalence study in cancer related mortality and probability to survival. To date this study is the one of the primary study to outline the gastrointestinal malignancy patient's survival trend.

In the current study, we found among the total 350 patients, 9.4% had carcinoma oesophagus, 22% had carcinoma stomach, 2.3% had adenocarcinoma of duodenum, 17.1% had hepatocellular carcinoma, 3.4% had periampullary carcinoma, 10% had pancreatic carcinoma, 5.4% had cholangiocarcinoma, 4.9% had carcinoma gallbladder, 15.4% had carcinoma colon, 4.9% had intra abdominal malignancy with unknown primary, 5.1% had gastrointestinal lymphoma. Among the total 138 alive patients 8% had carcinoma oesophagus, 23.2% had carcinoma stomach, 8.7% had hepatocellular carcinoma, 4.3% had periampullary carcinoma, 6.5% had pancreatic carcinoma, 5.1% had cholangiocarcinoma, 1.4% had carcinoma gallbladder, 29.7% had carcinoma colon, 3.6% had intra abdominal malignancy with unknown primary, 9.4% had gastrointestinal lymphoma. Among the 212 dead patients, 10.4% had carcinoma oesophagus, 21.2% had carcinoma stomach, 3.8% had adenocarcinoma of duodenum, 22.6% had hepatocellular carcinoma, 2.8% had periampullary carcinoma, 12.3% had carcinoma pancreas, 5.7% had cholangiocarcinoma, 7.1% had carcinoma gallbladder, 6.1% had carcinoma colon, 5.7% had intra abdominal malignancy with unknown primary and 2.4% had gastrointestinal lymphoma. Overall median survival of the all the study patients were 5 months. Among them, the medium survival were 13 months and for patients with palliative treatment were 4 months.

In the study, 33.3% patients with carcinoma oesophagus were alive and 67.7% patients expired during the follow up period (Mean 7.1±5.3 months). 6.1 % patients got curative treatment while 93.9% patients received palliative treatment. Median survival for overall carcinoma oesophagus patients

were 6 months, with curative treatment were 18 months and with palliative treatment 6 months. In India, 5 year survival in carcinoma oesophagus is 11.8% and one year was 34%⁸. Reported overall 5 years survival is 10-15% worldwide¹⁰. In Pakistan the median time of survival was 7 months¹¹. In Iran median survival was 9 months¹². If we consider worldwide 5 years survival trend, Bangladesh record is not adequate, but considering the neighboring countries, median survival of our carcinoma oesophagus patients is 6 months which is comparable with that of Pakistan.

In the study, 41.5% carcinoma stomach patients were alive and 58.4% patients expired during the follow up period (Mean 6.1±5 months). Patients got curative treatment was 22.1% while 77.9% patients received palliative treatment. Overall median survival of carcinoma stomach was 5 months, for patients with curative treatment 13 months and patients with palliative treatment 4 months. Worldwide median survival is 4 to 6 months¹³. In United states 5 year rate is 24.7%⁶. In India 5 year survival for Ca stomach was 10.1% and 1 year survival was 25.8%⁸. In case carcinoma stomach, the median survival in Bangladesh is not far from worldwide trend of survival rate.

In this study, we found in case of all adenocarcinoma of duodenum patients expired during the follow up period (Mean 5.9 months ± 4.4). All patients received palliative treatment. Overall median survival was 5 months.

Overall prognosis for hepatocellular carcinoma remains very poor. We found that patients with hepatocellular Carcinoma (HCC) 20% alive and 80% were expired respectively during the follow up period (Mean 5.9±4.8 months). All patients received palliative treatment. In USA 5 years survival is 12.3%¹¹. The median survival for hepatocellular carcinoma was 3 months in our study. HCC is rapidly fatal with 5 years survival around 5% in most countries¹³. Overall survival rates in Bangladesh is following the world trend in case of hepatocellular carcinoma.

In our study, we found that the patients with pancreatic carcinoma, 25.7% patients were alive and 74.3% patients expired during the follow up period (Mean 9.4 ± 7.2 months). All patients received palliative treatment with median survival was 3 months. In USA, 5 years survival is 5.1% whereas in India 1 and 5 year survival for pancreatic carcinoma 14.2% and 4.1% respectively^{6,8}.

Worldwide pancreatic cancer survival trend is 6 months and 1 year survival is about only 20%¹⁰.

Overall gallbladder carcinoma is aggressive disease with poor prognosis. We found that in carcinoma gallbladder, only 11.2% patients were alive and 88.8% patients expired during the follow up period (Mean follow up 3 ± 1.1 month). All patients received palliative treatment. Median survival was 3 months only. In world, overall 5 years survival rate is consistently less than 5% with a median survival of 5 to 8 months whereas 5 years survival in USA is 14.9%^{6,10}.

In our study, we found in carcinoma colon, 75.9% patients were alive and 24.1% patients expired during the follow up period (Mean follow up 9.7 ± 5.8 months). 46.3% patients got curative treatment while 53.7% patients received palliative treatment. Overall median survival for carcinoma colon, 9 months for patients for patients with curative treatment and 8 months for patients with palliative treatment. In USA, 5 years survival for carcinoma colon 63.9% whereas in India 1 and 5 years survival rate are 58.7% and 36.6% respectively^{6,8}. Colon cancer with distal metastasis is associated with poor prognosis with 5 years survival rates of only 5-10%¹⁰. In this study, we observed that curative treatment is much more effective than the palliative one. 12% patients survived more than 2 years who received curative treatment in comparison to 3.4% patients who received palliative treatment. The relationship is statistically significant [$p < 0.001$] and 63.2% patients expired during the follow up period (Mean follow up 5.5 ± 4.1 months).

After potential curative surgery for cholangiocarcinoma, median survival is around 40 months and 5 years survival is 45-56%, but for palliative therapy the median survival is only 6-12 months¹⁰. In our study, all the patients received palliative treatment and median survival was 4 months which is below the world trend.

Because of patient with periampullary carcinoma presents early in course of disease, the majority of patients may undergo a potentially curative surgical resection. We found, in periampullary carcinoma, 50% patient were alive and 50% expired during the follow up period (Mean 9.3 ± 7.2 months). Overall median survival was 12 months, 27 months for patients with curative treatment and 4 months for patients with palliative treatment. Worldwide median survival is 30-50 months with 5 years survival rates of 30-50% for surgically resected patients¹⁰.

In this study, out of 26 patients with gastrointestinal lymphoma, 72.2% were alive and 27.8% expired during the follow up period (Mean 10.2 ± 7.1 months). Overall median survival was 10 months, 12 months for patients with curative treatment and 4 months for patients with palliative treatment. In USA, 5 year survival is 56%¹⁴. The survival treatment trend for gastrointestinal lymphoma patients specially for whom who got curative treatment is better in Bangladesh as well as other part of the world.

In our study, we found that intraabdominal malignancy with unknown primary, 29.4% patients were alive and 70.6% patients expired during the follow up period (Mean 6.6 ± 4.1 months). Median survival rate was 5 months.

The differences in survival are due to factors related to cancer services and clinical factors. Survival represents the end result of the complex interplay of these factors, whose individual contribution into survival cannot be distinguished easily. Although studies in USA and UK have shown that improvements if treatment and screening probably had a major effect in colorectal mortality. In Bangladesh the survival trend in case of gastroenterological malignancy cases are not up to the world standard. But the patients who received curative treatment are having more chance of better survival. Hospital based health care system will increase of early diagnosis, thus produces a better chance of receiving curative treatment for the patients.

Limitation

It was done only in Dhaka city. Another major limitation of this study was inability to do staging of the cancer. So, it was difficult to identify patients probability of survival according to the staging.

Conclusion

This study was done to estimate the survival trend of the patients who had gastroenterological malignancy. The study also tried to analyze the impact of available treatment modalities as well as to determine the prognosis for malignancy involving different sites of gastrointestinal tract in Bangladesh. Overall median survival for gastroenterological malignancy was 5 months. The current study found that malignancy involving different sites of gastrointestinal tract were fatal with high mortality rate. Carcinoma stomach is the major contributor in the disease prevalence though hepatocellular carcinoma causes the highest number of death.

Colon cancer is the number two in prevalence series though the survival is highest among these patients. Most of our patients are seeking health care at an advanced stage. Most of the patients were getting palliative treatment instead of curative one. The study found only 18% cancer patients received curative treatment.

Recommendation

To increase the survival, early diagnosis and curative treatment has no alternative. Physicians, surgeons, oncologists and health policy makers will have to work in the respect. More prospective studies are needed to bring out the real scenario of the gastroenterological cancer patients in Bangladesh. Hospital and other health facilities should keep record on survival of the cancer patients.

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Contribution of authors

BP-Conception, design, acquisition data, interpretation of data & final approval.

SMAH-Data analysis, manuscript writing and final approval.

MNM-Critical revision, manuscript writing & final approval.

AR-Interpretation of data, critical revision & final approval.

Disclosure

All authors declared no conflict of interest.

References

1. Park K. Park's text book of preventive and social medicine. 15th ed. 1997;268:
2. WHO, The world Health Report of the director general of WHO. 1997.
3. Mayer JR. in: Gastrointestinal tract cancer. Fauci, Braunwald, Kasper, Hauser, Longo, Jameson, Loscalzo. Harrison's principles of internal medicine, 17 ed. McGrawHill. USA. 2008;1:570.
4. Cameron AD, Howard WCG, in: Oncology. Boon AN, Colledge RN, Walker RB . Davidson's principles and practice of medicine, 20th ed. UK. Churchill Livingstone publication. 2006;255.
5. Lister TA, Gallagher CJ, in: Malignant disease. Kumar P, Clark M. Clinical medicine. 6th ed. UK. Elsevier publication. 2005;486.
6. SEER Cancer Statistics Review. 1975-2005. National Cancer institute. USA. 2008.
7. Parkin DM, Whelan SL, Young J Jr. Raymond L. Cancer Incidence in Five continents. IARC Scientific publications No. 143. Lyon, International Agency for Research on cancer. 1997;VII.
8. Yeole BB, Kumar AV. Population-based survival from cancers having a poor prognosis in Mumbai (Bombay) India. Asian pac J Cancer prev . 2004; 5:175-182 .
9. Capocaccia R, Sant M, Berrino F, Simonetti A, Santi V, Trevisani F. Hepatocellular Carcinoma : Trend of incidence and survival in Europe and the United States at the End of the 20th Century. The American journal of Gastroenterology. 2007;102: 1661-1670.
10. Chou CJ, Gress GF, In : Esophageal tumors . Freidman LS, McQuaid RK, Grendell HJ. Current diagnosis and treatment of gastroenterology; 2nded. USA. McGraw Hill, 2003;299.
11. Yuen MF ,Hou JL, Chutaputti A. Hepatocellular carcinoma in the asia pacific region; J Gastroenterol Hepatol. 2009;24: 346-353.
12. Jamar a, Thomas A, Murrery T. Cancer Statistics. CA cacer J clin. 2002;52: 23-47 .
13. Samadi F, Babei M, Fallah M, Sajadi A, Shokui B. Survival rate of gastric and esophageal cancers in Ardabil Province, North-West Iran. 2007;10:32-37.
14. General Cancer Report. Surveillance, Epidemiology and End Results (SEER) Program. National cancer institute. US national institute for health. 2008.