RESEARCH COMMUNICATION

Survival of Colorectal Cancer in Iran

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Abstract

Objective: Colorectal cancer is the fourth cause of cancer after stomach, bladder, prostate in men and second cause after breast in women in Iran. It is estimated that 4,000 new cases occur each year with 1,150 deaths annually. The present study aimed to determine survival of colorectal cancers in Iran in a national manner. **Methods and Results:** The data from national cancer registry department of the Ministry of Health and Medical Education (MOH&ME) were used as the main source of incident colorectal cancer information in Iran from March 2000 to March 2005. One and five year survival proportions were 88% and 45% for females versus 86% and 39% for men. The median overall survival for colorectal cancer in Iran was 3.5 years with a 95 % confidence interval of 3.2-3.8 years. The worst survival status was found for patients less than 20 and more than 80 years old. **Conclusion:** The overall 5 year survival for colorectal cancer in Iran (41%) is comparable even with some developed countries but it is far from those with advanced health care systems, or community based screening programs. Thus at the policy level, application of an appropriate national cancer control program and management guidelines should be under consideration.

Key Words: Colorectal cancer - survival - Iran

Introduction

Colorectal cancer is the fourth cause of cancer after stomach, bladder, prostate in men and second cause after breast in women in Iran (skin cancer excluded) (Naghavi et al., 2005; Ministry of Health &Medical Education, Deputy for Health, 2005-2006). It is expected to become a major health problem globally as a result of high and increasing incidence and survival rate, but its features differ by age, sex and site. Survivorship also varies greatly with the geographical and economical status. Five year survival for patients with colon cancer diagnosed between 1985 and 1989 were 47% in Europe and 60% in United States, with corresponding figures for rectal cancer of 43% and 57% (Stewart and Kleihues, 2003; Iversen et al., 2005). In Iran cumulative 5 years prevalence is estimated at 20.5 in 100.000 for men and 18.8 for women (Akbari et al., 2008). The outcome of illness is severely depends on biology, including host response, the accuracy and value of diagnostic measures, the effectiveness of treatment, clinical performance and patients compliance (Iversen et al., 2005).

In Iran national cancer registry is based on laboratory registration with capability of 80 percent of case registry (Ministry of Health &Medical Education, Deputy for Health, , 2005-2006). Proper population based registry is started as a pilot project in some provinces which would be the corner stone of the comprehensive national cancer control program (Esnaashari et al., 2008). Based on the previous reports on colorectal cancer survival in Iran it is 49% and 43% (Emami et al., 2004; Ansari et al., 2007). Here we are going to introduce the survival of colorectal cancers in Iran in a national manner. The survival duration of each case was determined as the time difference between date of diagnosis and date of last follow up or death by telephone call or face to face visit.

Materials and Methods

The data from national cancer registry department of Ministry of Health and Medical Education (MOH&ME), which are pathology-based registered data, were used as the main source of information on incident colorectal cancers in Iran from March 2000 to March 2005. These data in the maximum capability consist 80% of incident cases. Totally 9,892 cases were identified as having colorectal cancers between 2000 and 2005. The demographic features were precise and complete, items such as age, sex, cancer site and pathology all being consistently covered. All registered cases with tumors in the cecum, ascending, transverse and descending colon, recto sigmoid and rectum were considered as colorectal cancer. To obtain information about patients, telephone calls were made. The data were analyzed by SPPS version 16 and assessment of survival rates was conducted using Kaplan-Meier methods and the log-rank test.

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Results

A total number of 9,892 patients with colorectal cancer were included in the study registered from March 2000 to March 2005 (Table 1). The available telephone numbers were 4,549 and on calling these numbers 2,357 cases had moved, changed their number or had died not due to colorectal cancer, so they were excluded from the survival study and the rest were included for follow up with number of 2,192 cases. On the closing day of follow up it was confirmed that 1,144 cases were alive and 1,048 cases had died due to colorectal carcinoma. There were 56% male cases and 44% female, the ages ranged between 4 to 103 years old with a mean age at the time of diagnosis 57.8 years old and an SD of 14.9 years (Table 2).

Tumor location was classified into seven groups and pathology into ten (Table 3). The one, two, three, four and five years overall survivals calculated by the Kaplan-Meier method were 84, 68, 54, 43, and 41%, respectively. The median overall survival for colorectal cancer in Iran was 3.5 years with a 95 % confidence interval of 3.2-3.8 years. Comparing men and women, the situation was significantly better among women rather than men (p value=0.02), one and five years survival was 88% and 45% for females versus 86% and 39% for men (Figure 1a). The highest number of patients were between the age of 50-70 years old, the best survival status was belong to age group of 41-50 years old, and worse survival status to patients less than 20 and more than 80 years old with significant difference (Table 2, Figure 1b).

Five year survival by site was distributed as follows: 61% for ascending colon, 57% in descending colon, 50% in sigmoid and 37% in rectum, there was statistically significant difference between rectum and other site of colon. The highest number of patients had adenocarcinoma in pathology reports (n=1915) followed by mucinous carcinoma (n=193), signet ring carcinoma (n=28), and lymphoma (n=27). The other types of pathology of colorectal were rare such as sarcoma (n=4), carcinoid (n=4), squamous cell carcinoma (n=3), melanoma (n=6)(Table 3). The 5 year survival was 43% for adenocarcinoma, 36% in mucinous carcinoma and 28% in signet ring and 49% in lymphoma.

Table 1. Age and Site Distribution of the 9,892 Cases of Colorectal Cancer

Age	Frequency	%	Site	Frequency	%
<20	48	0.5	Ascending Colon	561	5.7
21-30	356	3.6	Cecum	520	5.3
31-40	946	9.6	Colon. Nos	3,073	31.1
41-50	1,665	16.8	Descending Colon	301	3.0
51-60	2,162	21.9	Rectosigmoid		
61-70	2,255	22.8	Junction	626	6.3
71-80	1,736	17.5	Rectum, Nos	3,651	36.9
>80	377	3.8	Sigmoid	1,160	11.7
Total	9,545	96.5	Total	9,892	100.0

Source: MOH & ME, Cancer Registry Department

Table 2. Age and Sex Distribution of the Patients with Numbers of Dead Cases

Sex and Age	Total	%	Dead	%
Male	1,235	56.3	611	49.4
Female	957	43.7	437	45.6
<20	14	0.6	8	57.1
21-30	73	3.3	32	43.8
31-40	189	8.6	86	45.5
41-50	384	17.5	151	39.3
51-60	514	23.4	232	45.1
61-70	514	23.4	242	47.0
71-80	405	18.4	223	55.0
>80	99	4.5	74	74.7
Total	2,192		1,048	

Table 3. Site Distribution and Pathological Features of 2,192 Colorectal Cancer Cases

Site	Number	Dead	Pathology	Number	Dead
Ascending Colon	142	54	Adenocarcinoma	1,915	888
Cecum	118	49	Mucinous Ca.	193	106
Descending Colon	68	23	Signet Ring Ca.	28	20
Rectosigmoid			Lymphoma	27	13
Junction	125	55	Sarcoma	4	3
Rectum, NOS	840	450	Carcinoid	4	2
Sigmoid Colon	240	100	Squamous cell ca.	3	2
Colon, NOS	659	317	Melanoma	6	6
			Small cell ca.	2	1
Total	2,192	1,048	Others	10	7
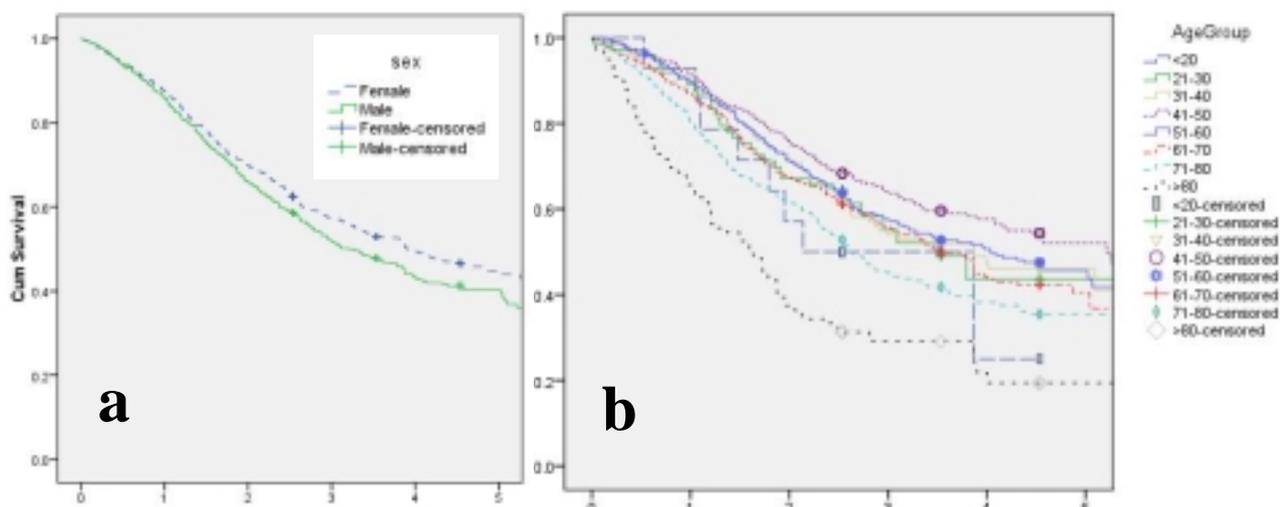
Figure 1. Overall Survival for 2,192 Cases of Colorectal Cancer in Iran. a) by Sex; b)by Age Group

Discussion

It is well established that the prognosis of colorectal cancers is depends on tumor related factors, patient status, diagnosis and treatment procedures (Emami et al., 2004). More advanced stages, location of tumor in rectum, poorly differentiated histology, vascular invasion, older ages and some gene amplifications are all associated with a worse prognosis of colorectal cancer. The surgical approach and appropriate use of adjuvant and neo adjuvant therapy also significantly affect overall survival (Shahrier et al,, 2000; Akbari et al., 2008). Study of Gatta provides important information on survival for colorectal cancer (Cross, 2001), it is stated that survival is related to stage, and surgical procedures to determining stage and higher number of lymph node sampled will be more likely to detect involved lymph nodes and consequent upstaging of disease (Van Wyk et al, 2000; Cross, 2001).The present study focused exclusively on overall survival rates and not stage specific survival because of its national nature. The main strengths of the study are large size and collected cases from entire country.

Proximal tumors are diagnosed in more advanced stages rather than distal, because of their less specific symptoms and more difficult diagnosis procedures (Brewster et al., 1997; Huang et al., 1999; Nelson et al., 1999; Yeole et al., 2001).The etiology of colorectal cancer has not been well ascertained yet, but strong indications of close relationship with dietary factors come from epidemiological studies. Colorectal cancers appear to be positively associated with consumption of saturated fats and animal protein and negatively associated with intake of vegetables and fruits (Capocaccia et al, 1997; Stewart and Kleihues, 2003; Esnaashari et al., 2008). Poor survival with advancing age was observed in our study as well for patients younger than 30 years old. Survival reports from most populations in US, Europe, Australia, and some in developing countries do not suggest very marked differences across age group except for poor survival in the elderly. Low survival rate in elderly is attributed to poor general health condition and the difficulties in prescribing radical cancer therapies (Yeole et al., 2001).

Studies in Europe have shown that 5 year survival in colorectal cancer cases has been improved. The survival in 1958-1962 was 40% for both sexes, and it was 56% and 60% in men and women respectively for 1993-1997 (Sant et al., 1995). Based study in Germany the 5 year overall survival was 41% (Lamberti et al., 2005), which is similar to our study and in India it was 33.6% (Yeole et al., 2001), in Italy 45% (Brewster et al .,1997) and in USA 63% (Kerr et al., 2005). In many studies throughout the world it was confirmed that overall survival is better for females rather than males and it will decrease with advancing the age (Capocaccia et al., 1997; Yeole et al., 2001; Martijn et al., 2003; Kerr et al., 2005). Tumor location is affected the overall survival rate in colorectal cancer in many reports, similar to our study with lower survival in rectum, but also there is some studies with no difference.(Ansari et al ,2007)

In conclusion, the overall 5 year survival for colorectal cancer in Iran (41%) is comparable even with some developed countries but it is far from the rates in those with advanced health care systems, or community-based screening programs. Thus on the policy level, application of an appropriate national cancer control program and management guidelines should be under consideration.

Acknowledgements

References

Akbari ME & coworkers, Iran Cancer report. Cancer Research Center, Shahid Beheshti University (M.C), 2008, Tehran, Iran.

Ansari R, Amjadi H, Norozbeigi N, Zamani F (2007). Survival analysis of colorectal cancer in patients underwent surgical operation in Shariati & Mehr Hospital-Tehran. *Govaresh J*, **12**, 7-16.

Brewster DH, Black RJ (1997). Breast, lung and colorectal cancer incidence and survival in South Thames Region, 1987-1992: the effect of social deprivation. *J Public Health Med*, **19**, 288-94.

Capocaccia R, De Angelis R, Frova L, et al (1997). Estimation and projections of colorectal cancer trends in Italy. *Int J Epidemiol*, **26**, 924-32.

Cross SS (2001). Survival for colorectal cancer. *Gut*, **48**, 868-9.

Emami SMH, Fatemi AM, Farajzadegan Z (2004). Epidemiology of colorectal cancer in Isfahan. *Govaresh J*, **10**, 134-9.

Esnaashari F, Akbari ME, Sohrabi MR, Kolahi AA, Yavari P, Abadi A, Estimation of Colorectal, Stomach, and Breast Cancer prevalance in Iran, Cancer Research Center, Shahid Beheshti University (M.C) 2008, Tehran Iran.

Huang J, Seow A, Shi CY, Lee HP (1999). Colorectal carcinoma among Chinese in Singapore: trends in incidence rate by anatomic subsite from 1968 to 1992. *Cancer*, **85**, 2519-25.

Iranian Annual of National Cancer Registration Report ; Ministry of Health &Medical Education, Deputy for Health, , 2005-2006, Iran

Iversen LH, Pedersen L, Riis A, et al (2005). Population-based study of short- and long-term survival from colorectal cancer in Denmark, 1977-1999. *Br J Surg*, **92**, 873-80.

Kerr J, Engel J, Eckel R, Hölzel D (2005). Survival for rectal cancer patients and international comparisons. *Ann Oncol*, **16**, 664-72.

Lamberti C, Di Blasi K, Archut D, et al (2005). Population-based registration of unselected colorectal cancer patients: five-year survival in the region of Bonn/Rhine-Sieg, Germany. *Z Gastroenterol*, **43**, 149-54.

Martijn H, Voogd AC, van de Poll-Franse LV, et al (2003). Improved survival for patients with rectal cancer since 1980: a population-based study. *Eur J Cancer*, **39**, 2073-9.

Naghavi M, Iranian annual of national death registration report, Ministry of Health &Medical Education, 2005

National Cancer Institute, SEER Cancer Review Statistics Review 1975-2002

Nelson RRL, Persky V, Turyk M (1999). Carcinoma in situ of the colorectum: SEER trends by race, gender, and total colorectal cancer. *J Surg Oncol*, **71**, 123-9.

Sant M, Capocaccia R, Verdecchia A, et al (1995). Comparisons of colon-cancer survival among European countries: The Eurocare Study. *Int J Cancer*, **63**, 43-8.

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Shahrier M, Ahnen DJ (2000). Colorectal cancer survival in Europe: the Will Rogers phenomenon revisited. *Gut*, **47**, 463-4.

Stewart BW, Kleihues P (2003). World Cancer Report,World Health Organization, IARC Press.

Van Wyk Q, Hosie KB, Balsitis M (2000). Histopathological detection of lymph node metastases from colorectal carcinoma. *J Clin Pathol*, **53**, 685-7.

Yeole BB, Sunny L, Swaminathan R, Sankaranarayanan R, Parkin DM (2001). Population-based survival from colorectal cancer in Mumbai, India. *Eur J Cancer*, **37**, 1402-8.