Colorectal Cancer Prevalence According to Survival Data in Iran-2007

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Abstract

Objective: Colorectal cancer is a common (5000 new cases per year in Iran) and lethal disease. Regarding the high incidence (7 cases per 100000) and survival rate of colorectal cancer and the priority of prevalence index in cancer management, in this study, 1, 2-3 and 4-5 year point prevalence were determined according to survival data.

Method: In this study, survival and incidence data were used for the determination of cancer prevalence. Incidence data were extracted from cancer registry in Iran and survival data were determined during a descriptive study through the follow up of 2342 colorectal cancer patients. 1, 2-3 and 4-5 year point prevalence were estimated from incidence rates in different years and the proportion of patients surviving 0.5, 1.5, 2.5, 3.5 and 4.5 year(s) from diagnosis .

Results: Proportion of cases surviving 0.5, 1.5, 2.5, 3.5 and 4.5 year(s) from diagnosis were 79.2%, 65.08%, 57.36%, 51.76% and 48.87%, respectively. Estimates of 1, 2-3 and 4-5 year prevalence were 4156, 5715 and 4283, respectively. The cumulative 5 year prevalence was 13954 cases.

Conclusion: These estimates of 1, 2-3 and 4-5 year prevalence are applicable to the evaluation of initial treatment, clinical follow-up and point of cure, respectively. Therefore, 1, 2-3 and 4-5 year point prevalence estimates are necessary in health service planning for cancer management.

Keywords: prevalence, colorectal, cancer, Iran

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Introduction

Colorectal cancer is a fatal disease and epidemic (5000 new cases every year) relatively [1, 2]. Its age standardized incidence rate in Iran has been 9.27, 9.64 and 9.90 in 2003, 2004 and 2005 in 100000 Iranian men and 9.12, 9.47 & 9.13 in 100000 Iranian women, respectively [2,3,4]. According to these studies, about 5000 individuals in Iran (7 per 100,000 population) are afflicted to Colorectal Cancer annually [2]. In addition, based on Ministry of Health and Medical Education statistics in 2003, the number of death resulted from Colorectal Cancer was 1130 people (450 women and 680 men), so Colorectal Cancer mortality rate is estimated to be about 2 per 100,000 population (1.3 per 100,000 women & 1.9 per 100,000men) [5].

It is anticipated that "Colorectal Cancer prevalence" rate in Iran be a mass dilemma because of its increasing survival rate and high incidence.

For most cancer sites, cases surviving 5 years from diagnosis have the same life span as the general population; therefore, most of the workload is done within these first 5 years. For this reason, estimation of 1, 2-3 and 4-5 year prevalence are essential for the evaluation of initial treatment, clinical follow-up and point of cure, respectively, for the majority of cancers [6].

Pisani et al. used surveillance results and age standardized incidence rate in order to compute prevalent cases in various years after diagnosis, and estimated 1, 2-3 and 4-5 year cancer prevalence in 25 different regions in the world [6].

Cumulative 1-5 year prevalence rate of colorectal cancer in developed countries and developing countries were 148.2 & 18.9 in 100,000 women and 160 & 21.1 in 100,000 men, respectively [6].

1, 2-3 and 4-5 year prevalence rate in developed countries is 43.1, 66 and 50.9 in 100,000 men and 39.6, 61 and 47.7 in 100,000 women, respectively. This rate is 5.9, 8.6 & 6.5 in 100,000 men and 5.3, 7.7 & 5.9 in 100,000 women in developing countries, respectively [6].

Since 5 year survival data is not available for most cancers in Iran; in spite of the current incidence

rate, prevalence rate is not clear yet. Due to the importance of prevalence index in cancer management, cancer prevalence rate, which indicates new cases plus persons who live with cancer from previous years, shows what are the needs and what facilities should be prepared in the health system for responding to these needs. On the other hand, cancer prevalence shows the number of people who need defined services in a specified time in the society. Therefore, the aim of this study was to estimate 1, 2-3and 4-5year point prevalence of colorectal cancer according to surveillance data in order to determine early treatment, clinical follow-up and remission time together with rehabilitation supports.

Materials and Methods

The present paper was conducted as a descriptive study through the follow up of 2342 colorectal cancer patients. There are 9892 colorectal cancer patients registered in "Iran Cancer Registration Center". These patients were studied between 2000 and 2004. The patients with cecum, ascending colon, transverse and descending colon, rectosigmoid and rectum tumor were considered as colorectal cancer.

In the above mentioned center, patients' specifications such as age, gender, address, telephone number and tumor pathology are registered. All patients registered in this center between 2000 and 2004 who had a phone number (4500 cases) were called. We asked them about their disease condition and if the responder announced the patient's death, exact date of death and the cause was asked. From 4500 phoned patients, 2158 cases refused to answer because of not receiving sufficient information while 2342 patients accepted to cooperate. The reasons for refusing to answer were wrong telephone number, moving or personal dislike.

During communication with the families, ethics were considered. Information was analyzed by SPSS using "lifetime table" and 0.5, 1.5, 2.5, 3.5 and 4.5 year surveillance rates were computed and used in the final prevalence formula.

Age specific incidence rate in age groups for 2003, 2004 and 2005 (5 year interval) was used from national report of cancer registration in the mentioned years: 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 75-74, 75-79, 80-84 and >85 years. According to 60, 70 and 81 percent coverage of pathology centers during 2004, 2003 and 2005 respectively, adjusted incidence rate was estimated.

Then, for computing the prevalent cases of age K, we used the following formula in which Dr. Pisani et al. used incidence rates and year-specific survival probabilities.

$$P_k(n) = \sum IC_{k-i} * S_{k-i}(i-0.5)$$

Where:

IC_x = annual number of new cases at age x

$S_x(t)$ = the proportion of cases diagnosed at age x and alive at time t after diagnosis n=the number of years as case or number of years before cured.

k = shows the age for which prevalence formula is computed.

Findings

From 9892 patients, 2342 were followed up. Average age of colorectal cancer patients was 58.13±14.74 years (ranging from 7 to 103 years old). Among them, 26.2% were women and 73.8% were men. Observed survival rate at 0.5, 1.5, 2.5, 3.5 & 4.5 year(s) was computed to be 79.02, 65.08, 57.36, 51.76 and 48.78 percent, respectively. Observed 5-year survival rate in affected colorectal cancer patients was 47.36%.

In table 1, observed survival data has been shown according to gender.

Table 1 *Observed survival of colorectal cancer in IRAN according to sex*

Observed survival	Male	Female
0.5 year	78.22%	0.06%
1.5 year	63.31%	67.36%
2.5 year	55.12%	60.19%
3.5 year	49.91%	54.13%
4.5 year	46.10%	52.28%

Observed 5-year survival rate for colorectal cancer patients was measured to be 46.1 and 49.01 percent in affected men and women, respectively.

1, 2-3 and 4-5 year point prevalence was 5.77, 7.94 & 5.95, respectively, in 100000 populations.

1, 2-3 and 4-5year prevalence rate was estimated to be 6.09, 8.35 & 6.04 in 100000 men and 5.45, 7.52 & 5.86 in 100000 women, respectively.

Cumulative 1–5 year prevalence per 100,000 men and women was 20.48 & 18.82 respectively. Cumulative 1–5 year prevalence in the whole population was 19.66 per 100000.

Table 2 gives proportions of cases surviving 1, 2–3 and 4–5 year(s). The statistics can be summed to give the prevalence of all cases diagnosed within 5 years.

Table 2: *Iran prevalence colorectal cancer in 2007*

Prevalence	Male	Female	Total
1 year	2211	1945	4156
2-3 year	3031	2684	5715
3-4 year	2192	2091	4283
Cumulative 5 year	7434	6520	13954

Table 3: *Cumulative 5 year prevalence of colorectal cancer in 2007 according to age and sex groups*

Age groups	Female	Male	Total (percent)
0~4	0	5	5(0.04)
5~9	0	7	7(0.05)
10~14	3	7	10(0.07)
15~19	8	6	14(0.10)
20~24	33	53	86(0.61)
25~29	107	126	233(1.65)
30~34	203	197	400(2.83)
35~39	304	316	620(4.38)
40~44	401	465	866(6.12)
45~49	602	588	1189(8.40)
50~54	807	796	1603(11.32)
55~59	873	761	1635(11.55)
60~64	759	729	1488(10.51)
65~69	719	791	1509(10.66)
70~74	730	986	1716(12.12)
75~79	720	969	1688(11.93)
80~84	407	574	982(6.94)
85+	43	59	103(0.73)
Total	6520	7434	13954(100%)

Discussion

Prevalence is a relevant measure in the context of health service planning which reflects the number of individuals in the community requiring a defined care procedure at the same time.

We can estimate cancer prevalence through counting registered people in "Cancer Registration Systems" directly. This system not only should register results and data for a long time, but also needs patients' treatment/remission conditions on follow-ups which is almost impractical in highly populated countries like Iran.

Population surveys have been a practical alternative, although this approach leads to the underestimation of true values [6].

Thus, using afore mentioned formula for measuring cancer prevalence seems reasonable. Two main factors in prevalence rate are survival rate and incidence rate.

In colorectal cancer, 0.5, 1.5, 2.5, 3.5 & 4.5 year surveillance rates have been calculated as 79.2%, 65.08, 57.36, 51.76 and 48.87%, respectively.

1, 2-3 and 4-5 year prevalence of colorectal cancer with cumulative 5-year prevalence in all population were 4156, 5715, 4283 and 13954 cases, respectively.

5-year survival rate of colorectal cancer has been reported to be 47.36% which is lower than the world.

5-year survival rate of colorectal cancer has been 64% in 17 SEER (Surveillance Epidemiology and End Results) regions according to 1996 – 2003 information. 5-year survival rate of colorectal cancer in black and white race is 64.9% & 55.2% in men and 64.9% & 54.7% in women, respectively [7].

A study between 1993 and 1997 in Europe showed that 5-year survival rate of colorectal cancer is 56 & 60 percent in men and women, respectively [8], which is 15% higher than the present study. In 4 conducted studies in Germany [9], India [10], Italy [11] and US [12]; 5-year survival rate of colorectal cancer was reported to be 41, 33.6, 45 & 63 percent, respectively.

Higher survival rate of colorectal cancer in Europe and US is perhaps due to earlier diagnosis and new treatment modalities that are available to all people, while in Iran, all affected individuals are not sufficiently treated.

Hosseini nasab SA et al. conducted a historical cohort study in Yazd [13]. They detected 130 colorectal cancer cases, according to pathology, who were followed between 1982 and 2001. In their research, 5-year survival rate was measured to be 54.79 and 45.62 percent in men and women, respectively; which was more than the present study. The reason for the lower survival rate in the present study is the case population which was selected for research from all regions of Iran. However, in the study in Yazd, patients were from one private center in which treatment services were relatively sufficient.

According to the mentioned study, 1 year prevalence rate of colorectal cancer was 6.09 in 100,000 men which is lower than developed countries (43.1 per 100,000) but higher than developing countries (5.9 per 100,000) [6]. Regarding women, we also observe a similar difference.

One year prevalence rate of colorectal cancer in women is 39.6, 5.3 & 4.54 per 100,000 in developed countries, developing countries and Iran, respectively.

Pisani et al., in a study for measuring prevalence in 25 world regions, mentioned more incidence of cancer and more survival in developed countries [6]. According to their study, the difference is greater in costly cancers with complex treatments.

The difference in the 2-3 and 4-5 year and the cumulative 5-year prevalence rate are similar.

According to the mentioned amounts in Pisani's study, colorectal cancer prevalence rate in Iran is similar to the southeast of Asia [6].

In this zone (Asia southeast), 1, 2-3 and 4-5 year prevalence rate is reported to be 6.3, 9.2 & 7.1 and 5.6, 8.2 & 6.4 in men and women, respectively (in 100,000 population) [6].

Totally, about 0.006 percent of men and 0.005 percent of women with colorectal cancer (1 year prevalence) are treated. Also, about 0.008% of men and 0.007% of women (2-3 years prevalence) are under clinical follow-up and 0.006% of both groups (4-5 years prevalence) are in remission.

These findings are very helpful for health planners to prepare needed services.

The advantage of this study was the great number of follow-up population. According to calculations, a sample size of 395 cases was needed to calculate survival rate with 95% confidence , whereas in this study, 2342 cases were evaluated (6 times more) which minimizes the role of confounding factors (because of unsuccessful follow-up of 2185 cases and probable difference of this group with followed-up cases)

Totally, in Iran, there are 13954 patients with colorectal cancer. Among them, 7434 cases are men and 6520 cases are women. About 4156 cases (2211 men & 1945 women) need early treatment (1 year prevalence) for cancer. Also, 5715 cases (3031 men & 2684 women) are under clinical follow up (2-3 years prevalence) and 4283 cases (2192 men and 2091 women) are in remission (4-5 years prevalence).

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