

Mortality trends of gastrointestinal cancers in Iranian population

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ABSTRACT

Aim: The aim of this study was to evaluate the mortality rates and trends from Gastrointestinal (GI) cancer in Iranian population from 1995 to 2003.

Background: Cancer is the third most common cause of death in Iran. Gastrointestinal cancer is the most important cause of mortality due to cancer. The cancer mortality data is important to monitor the effects of screening program, earlier diagnosis, demographic data and other prognostic factors.

Patients and methods: National death statistic reported by the Ministry of Health and Medical Education (MOH&ME) from 1995 to 2003, stratified by age group, sex, and cause of death is included in this analysis. Colorectal cancer (CRC) [ICD-9; 153-154], Gastric cancer (GC) [ICD-9; 151], Pancreas cancer (PC) [ICD-9; 25], Esophageal cancer (EC) [ICD-9; C15] and Hepatocellular carcinoma (HCC) [ICD-9; 20] were expressed as the annual mortality rates/100,000, general and/or per gender, and age group.

Results: The cause of specific mortality rate of CRC slightly increased during the years while under study and for GC and EC showed a sharp increase. In contrast, the mortality rate of PC decreased slightly during the years while under study. The rate of HCC mortality moderately increased. All mortality rates were higher for male than female.

Conclusion: Our study indicated remarkable increasing trends in mortality of GI cancer in Iran specifically for CRC and GC. Developing for GC and EC for both primary prevention and early detection programs and providing the facilities for CRC screening, would be the options to control the mortality and burden of GI cancers in the future.

Keywords: Colorectal cancer, Gastric cancer, Esophageal cancer, Pancreas cancer, Hepatocellular carcinoma.

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Introduction

Cancer is the third most common cause of death in Iran and annually 30,000 of Iranian die due to cancer (1). The gastrointestinal (GI) cancers are the most frequent cancers among Iranian males and second among females (2, 3). Generally, GI cancers account for nearly half of all cancer causes of deaths in Iran (1). According to the cancer

registry program, it is estimated that majority of the GI cancers occur in the stomach and the next sites most commonly affected by GI cancers are the colon and rectum (colorectal cancers), esophagus, pancreas and liver (4) and these cancers are the most common gastrointestinal malignancies in Iran (5).

Despite its recent decline, gastric cancer is the fourth most common cancer and the second leading cause of cancer-related death worldwide (6, 7). Iranian data suggested that GC is a fatal

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cancer in term of life lost and mortality (8-12) with high burden of hospitalization (3).

Colorectal cancer (CRC) is another public health burden in most industrialized countries (13) and one of the mortal cancers worldwide with economically developed countries having the highest incidence (14).

According to Iranian studies, there is a younger age distribution for CRC compared to western reports (15, 16).

Esophageal cancer (EC) is one of the most common cancers in the world (17) with very low rates of survival (18). The incidence of esophageal cancer in Iran is variable similar to other high-risk areas of the Asian esophageal cancer belt (2).

Hepatocellular carcinoma (HCC) represents approximately the sixth most prevalent cancer worldwide and due to the poor prognosis it is also the fourth cause of death related to cancer (17). Burden of HCC is not high in Iran because most cases are due to hepatitis B and this infection was less common in Iran than Southeast Asia and Africa (19). Pancreatic cancer (PC) is a fatal cancer, which accounts for about 220,000 deaths annually and is the sixth major cause of cancer-related mortality (17, 20). In Iran, pancreatic cancer is not ranked in the top 10 for newly diagnosed cases (21).

Death statistics are important factors to monitor the effects of screening program, early diagnosis and other prognostic factors (22). So the aim of this study was to evaluate the mortality rates and trends from GI cancers in Iranian population during a period of a decade, i.e. from 1995 to 2004.

Methods

National death statistic reported by the Ministry of Health and Medical Education (MOH&ME) from 1995 to 2000 (registered death statistics for Iranian population at the Information Technology and Statistic Management Center, MOH&ME) and from

2001 to 2004 (published by MOH&ME) (1, 23, 24) stratified by age group, sex, and cause of death (coded according to the 9th revision of the International Classification of Diseases [ICD-9]) are included in this analysis. GC [ICD-9; 151], CRC [ICD-9; 153-154], EC [ICD-9; C15], HCC [ICD-9; 20] and PC [ICD-10; 25] were expressed as the annual mortality rates/100,000 overall, by sex and by age group (<15, 15-49 and \geq 50 years of age). The population of Iran in 1995-2004 were estimated by age group and sex using the census from 1996 conducted by Statistics Centre of Iran and its estimation according to population growth rate for years before and after national census (25).

Results

All death records due to GC, CRC, EC, HCC and PC from 1995 to 2004 are included in this study (for HCC and PC just data available from 1999 to 2004).

By adjusting the populations of Iran in the years under study, the mortality rate was calculated per 100,000. The highest mortality rate belongs to GC, which showed a sharp increase from 1.68 to 8.78 during the years of study. However, a slight decrease was observed between 2002 and 2004 (Table 1, Figure 1).

Table 1. Crude mortality rate for GI Cancer mortality during the period 1995-2004 per 100,000

	CRC	GC	HCC	EC	PC
1995	0.44	1.68	NA	0.71	NA
1996	0.70	3.04	NA	1.41	NA
1997	0.86	3.38	NA	1.36	NA
1998	1.02	2.29	NA	1.46	NA
1999	1.22	5.70	2.56	1.98	1.16
2000	1.49	6.04	3.04	2.18	1.03
2001	1.69	6.47	3.33	2.10	1.05
2002	2.42	9.86	3.88	3.71	0.89
2003	2.54	9.67	3.76	3.58	0.90
2004	1.39	8.78	3.53	3.35	0.73

Colorectal Cancer (CRC), Gastric Cancer (GC), Hepatocellular Carcinoma (HCC), Esophageal Cancer (EC), Pancreas Cancer (PC), NA:No data available for this year

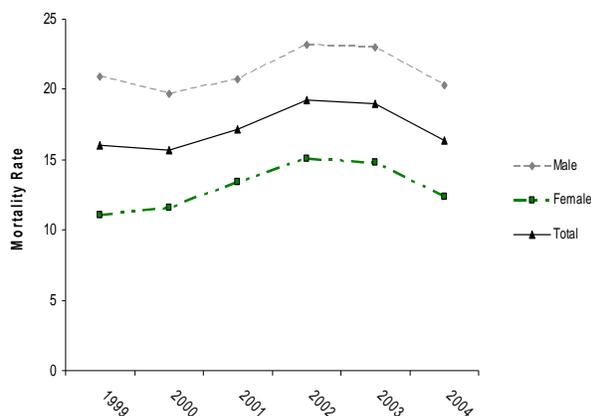


Figure 1. Trends of GI Cancer mortality during the period 1999-2004 by sex groups (rate per 100,000)

In addition, GC mortality rate was higher for men (Table 2). The crude mortality rate of CRC slightly increased during these years from 0.44 to 2.54 and decreased a little in 2004 (Table 1). There is also an increasing trend for EC in this period (Table 1, Figure 1). However, a slight decrease was observed from 2002 to 2004. The rate was higher for men as well (Table 2).

The rate of HCC mortality has moderately increased from 1999 to 2003 and seems to be leveled off in 2004 (Table 2). Besides, the mortality due to HCC for men was high comparing to women

considerably (Table 2).

The mortality rate of pancreatic cancer decreased slightly during the years under the study. It was higher for male and declining was more for men than women and it seems that pancreatic cancer mortality trend for women was leveled off with slight decrease from 0.77 in 1999 to 0.57 in 2004 per 100,000 (Table 2).

The total rate for all deaths due to GI cancers (merged data from 1999 to 2004) indicated that the mortality was increased from 16.06 per 100,000 in 1999 to 19.03 per 100,000 in 2003 and slightly decreased in 2004. The rate was higher for men and increased as age increased (Table 3).

Table 3. Mortality rate for total GI Cancer mortality during the period 1995-2004 stratified by sex and age group per 100,000

Year	Age group			Sex group (Male/Female)		Total crud rate
	<15	15-50	>50	M	F	
1999	0.10	3.83	111.5	20.87	11.07	16.06
2000	0.34	3.80	113.84	19.69	11.59	15.72
2001	0.43	3.90	105.96	20.75	13.39	17.15
2002	0.20	4.42	130.13	23.21	15.11	19.28
2003	0.34	4.25	127.53	23.03	14.84	19.03
2004	0.45	4.01	110.65	20.26	12.39	16.41

Table 2. Crude mortality rate for GI Cancer mortality during the period 1995-2004 stratified by sex group per 100,000

	CRC		GC		HCC		EC		PC	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
1995	0.41	0.46	1.18	2.17	NA	NA	0.68	0.73	NA	NA
1996	0.56	0.81	1.03	3.95	NA	NA	1.10	1.70	NA	NA
1997	0.64	1.04	2.29	4.44	NA	NA	1.11	1.61	NA	NA
1998	0.91	1.13	3.22	5.32	NA	NA	1.30	1.61	NA	NA
1999	1.00	1.43	3.97	7.36	1.96	3.13	1.59	2.36	0.77	1.54
2000	1.25	1.73	4.55	7.47	2.66	3.14	1.78	2.55	0.70	1.25
2001	1.52	1.86	4.93	7.49	2.84	3.80	1.81	2.39	0.86	1.22
2002	1.96	2.86	7.27	12.29	3.30	4.43	3.13	4.28	0.64	1.13
2003	1.90	3.15	7.05	12.17	3.22	4.28	3.22	3.92	0.70	1.10
2004	1.23	1.48	6.15	11.30	2.77	4.26	2.74	3.93	0.57	0.89

Colorectal Cancer (CRC), Gastric Cancer (GC), Hepatocellular Carcinoma (HCC), Esophageal Cancer (EC), Pancreas Cancer (PC), NA:No data available for this year

Discussion

The results of this study indicated the rate of mortality for GI cancers has been increasing or stabilized during the years under study. The GC and EC showing a sharp decrease, CRC slightly increasing, HCC stabilized and PC decreased. The total deaths due to GI cancer seem to be stabilized according to all GI cancers.

Cancer is still an increasing health problem in Iran and cancers of GI tract has been reported as the most common fatal cancer in Iran. (3).

Cancers of the gastric, esophagus and colorectal are now the three leading types of cancer found in males. Also, in some areas of Iran cancers of the breast, esophagus and gastric in females are prominent (26). In contrast to our findings, European studies showed that CRC and GC mortality decreased (27, 28). The incidence of GC in Iran is still high (26) and most of patients are diagnosed in a “non curable” stage (10, 29) because most patients are diagnosed in advanced stage and there is no early detection strategy in Iran to detect the patients in lower stage of disease (11). In North America, CRC incidence and mortality showed a trend towards declining (7) and its mortality in the European Union was also decreasing (30). However in Eastern Europe an increasing incidence and mortality has been registered (31).

The incidence of CRC in Iran has remarkably increased over the last three decades (32, 33). The incidence is still lower in older Iranians; however, it is close in young Iranians and Americans (34). Therefore, the similarity and the linear increasing trend of its mortality maybe a good predictor of the higher burden in future (35).

The mortality of Esophagus cancer in some western countries such as France and Italy, have continuously decreased and in others like UK and US, has gradually increased since 1960 (36). Chinese data and Japanese data revealed that mortality rates for EC are decreasing (36, 37).

Tobacco and alcohol are common risk factors for EC in the world (38, 39). But in Iran it seems that patterns of food and nutrient consumption (including drinking hot tea) and also socio-economic status are playing the main role in high-risk area of Iran (40, 41, 42).

The mortality rate of HCC in Iran seems to be reaching the plateau. A recent study in southern Iran indicated the predominant cause for HCC was hepatitis B (43) and this infection was less common in Iran (19). Besides, the mass vaccination program against hepatitis B started in 1993 and reached 94% coverage in 2005 (44). Therefore, the impact of vaccination on decreasing the burden of HCC is supposed to be in future decades (19).

The declining trend of pancreatic cancer mortality in Iran is in contrast to western countries such as Germany, US, France and Spain, which have reported an increasing trend according to WHO Mortality Database (45). Pancreatic cancer is one of the cancers, which are correlated with industrialization and majority of deaths occurred in developed countries (46). Pancreatic cancer is a fatal cancer with low survival. Iranian mortality data suggested the trend of this fatal cancer is still low and may be leveled off in recent years (47, 48).

A limitation of this study is underestimating the mortality for cancers in Iran due to poor registry (1). There were no registered data for HCC and PC before 1999 and after 2004, no completed data were published yet by the Ministry of Health and Medical Education (MOH&ME) in order to update the trend information.

In conclusion, the trend of GI cancer mortality in Iranian population has increased in recent years and it seems to be leveled off. The access of screening for CRC (49), developing a gastric cancer early detection program (11) and conducting a program to increase general awareness of known and probable risk factors of

EC (50, 51), may be helpful to reduce the burden of these fatal cancers in Iranian population.

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