Trend Analysis of Gastric Cancer and Colorectal Cancer Mortality in Iran, 1995-2003

Pourhoseingholi MA[1], Faghihzadeh S[2], Hajizadeh E[2], Gatta G[3], Zali MR[1], Abadi AR[1]

Abstract

Background: Cancer is the third most common cause of death in Iran. Gastric cancer (GC) and colorectal cancer (CRC) are two important causes of mortality due to cancer. With regards to cancer mortality, data are important to monitor the effects of screening program, earlier diagnosis, demographic data and other prognostic factors. The aim of this study was to evaluate the mortality rates and trends from GC and CRC in Iranian population during a period of almost a decade, i.e. from 1995 to 2003.

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 are included in this study. CRC and GC were expressed as the annual mortality rates/100,000, general and/or per gender, and age group.

Results: The general mortality rate of CRC slightly increased during the years under study from 0.44 to 2.54 and CRC mortality was higher for older age and male. The general mortality rates of GC showed a sharp increasing from 1.68 to 9.67. In addition to this, GC mortality rate was higher for male than female.

Conclusion: Our study indicated remarkable increasing trends in GC and CRC mortality. So developing for a gastric cancer for both primary prevention and early detection programs and manage the delays of diagnosis is recommended to decrease the trend of GC mortality. For CRC, since the rate of CRC screening is very low in Iran, it is recommended that in Iran screening be started as a public program in order to control the mortality and burden of CRC in the future.

Keywords: Colorectal cancer; Gastric cancer; Mortality; Trend analysis; Iran

1. Research Center for Gastroenterology and Liver Diseases, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Biostatistics, Tarbiat Modares University, Tehran, Iran
3. Institute Nazionale Tumori, Via Venezian 1, Milan, Italy
4. Department of Biostatistics, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Corresponding Author:
Mohamad Amin Pourhoseingholi; PhD of Biostatistics
Tell: (+98) 21 22 43 25 15
Email: amin_phg@yahoo.com

Introduction

Cancer is the third most common cause of death in Iran [1]. The gastrointestinal (GI) cancers are the most frequent cancer among Iranian males and second to breast cancer among females [2]. According to the cancer registry program and the Cancer Institute cancer research centre, it was earlier estimated that the majority of GI cancers occur in the stomach and the next sites which most commonly affected by GI cancers are the colon and rectum [3] and these cancers are the most common gastrointestinal malignancies in Iran [4].

GC is an important cause of mortality due to cancer [5] and is predicted to be the eighth leading cause of all deaths worldwide in the year 2010 [6]. Although the incidence of GC is decreasing, it's rarely detected early, and the prognosis remains poor. The majority of GC shows distant metastasis at the time of diagnosis [7]. Iranian data suggested that GC is a fatal cancer in the term of life lost [8-10] with high burden of hospitalization among gastrointestinal tract cancers [11].

CRC is another public health burden in most industrialized countries[12] and CRC is now the third most common cause of cancer-related deaths in the world[13]. Iranian data suggested a younger age distribution for CRC compared to Western reports [10, 11, 14, 15].

With regards to cancer mortality, data are important, together with other epidemiologic indicators such as incidence and survival, to monitor the effects of screening program, early diagnosis, other prognostic factors and also the risk in the population (incidence) [16].

Table 1. CRC mortality rate and trend by sex and age

	<15 Years		15-49 Years		≥50 Years		All ages		Total
	Male	Female	Male	Female	Male	Female	Male	Female	
1995	0.1 (1)	0.03 (3)	0.17 (26)	0.07 (10)	2.96 (113)	2.96 (107)	0.46 (140)	0.41 (120)	0.44 (260)
1996	0.06 (6)	0.05 (5)	0.28 (45)	0.27 (42)	5.05 (196)	3.49 (128)	0.81 (247)	0.59 (175)	0.7 (422)
1997	0.07 (8)	0.03 (3)	0.46 (75)	0.21 (33)	6.13 (242)	4.18 (156)	1.04 (325)	0.64 (192)	0.85 (517)
1998	0.1 (11)	0.06 (7)	0.39 (64)	0.39 (62)	7.12 (286)	5.54 (207)	1.13 (359)	0.91 (276)	1.02 (635)
1999	0.06 (7)	0.08 (9)	0.55 (92)	0.49 (80)	8.89 (363)	5.75 (222)	1.43 (462)	1.00 (311)	1.22 (773)
2000	0.18 (22)	0.09 (10)	0.69 (116)	0.51 (83)	10.71 (428)	8.15 (301)	1.73 (566)	1.25 (394)	1.49 (960)
2001	0.11 (12)	0.06 (6)	0.71 (127)	0.5 (86)	10.34 (483)	8.96 (393)	1.86 (622)	1.52 (485)	1.69 (1107)
2002	0 (0)	0 (0)	0.9 (171)	0.7 (128)	18.6 (805)	11.97 (502)	2.86 (976)	1.95 (630)	2.42 (1606)
2003	0.13 (10)	0.1 (6)	1.03 (200)	0.6 (111)	19.59 (875)	11.97 (509)	3.15 (1087)	1.90 (626)	2.54 (1713)

Number of deaths is included in parentheses

Table 2. GC mortality rate and trend by sex and age

	<15 Years		15-49 Years		≥50 Years		All ages		Total
	Male	Female	Male	Female	Male	Female	Male	Female	
1995	0.1 (1)	0.04 (4)	.36 (56)	.26 (40)	15.58 (595)	8.25 (298)	2.17 (652)	1.18 (342)	1.68 (994)
1996	0.16 (17)	0.06 (6)	.78 (125)	.69 (106)	27.44 (1066)	13.81 (507)	3.95 (1208)	1.03 (619)	3.04 (1827)
1997	0.16 (18)	0.08 (9)	.93 (151)	.73 (115)	30.74 (1214)	15.02 (561)	4.44 (1383)	2.29 (685)	3.38 (2068)
1998	0.15 (17)	0.12 (13)	1.21 (200)	.92 (146)	36.55 (1465)	21.65 (822)	5.32 (1682)	3.22 (981)	2.29 (2663)
1999	0.24 (27)	0.22 (24)	1.70 (284)	1.15 (187)	50.39 (2058)	26.41 (1020)	7.36 (2369)	3.97 (1231)	5.70 (3600)
2000	0.2 (24)	0.24 (28)	1.69 (283)	1.26 (207)	53.51 (2138)	32.40 (1197)	7.47 (2445)	4.55 (1432)	6.04 (3877)
2001	0.1 (11)	0.1 (11)	1.71 (306)	1.10 (189)	49.91 (2332)	30.40 (1375)	7.49 (2649)	4.93 (1575)	6.47 (4224)
2002	0.14 (9)	0.9 (50)	2.40 (457)	1.57 (286)	86.09 (3728)	48.88 (2050)	12.29 (4194)	7.27 (2386)	9.86 (6580)
2003	0.13 (10)	0.1 (6)	2.10 (408)	1.55 (288)	84.41 (3768)	47.61 (2026)	12.17 (4186)	7.05 (2320)	9.67 (6506)

Number of deaths is included in parentheses

The aim of this study was to evaluate the mortality rates and trends from GC and CRC in Iranian population during a period of almost a decade, i.e. from 1995 to 2003.

Materials and 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 2003 (published by MOH&ME) [1, 17, 18] 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. CRC [ICD-9; 153-154] and GC [ICD-9; 151] were expressed as the annual mortality rates/100,000, overall, by sex and by age group (<15, 15-49 and ≥50 years of age). The populations of Iran in 1995-2003 were estimated by
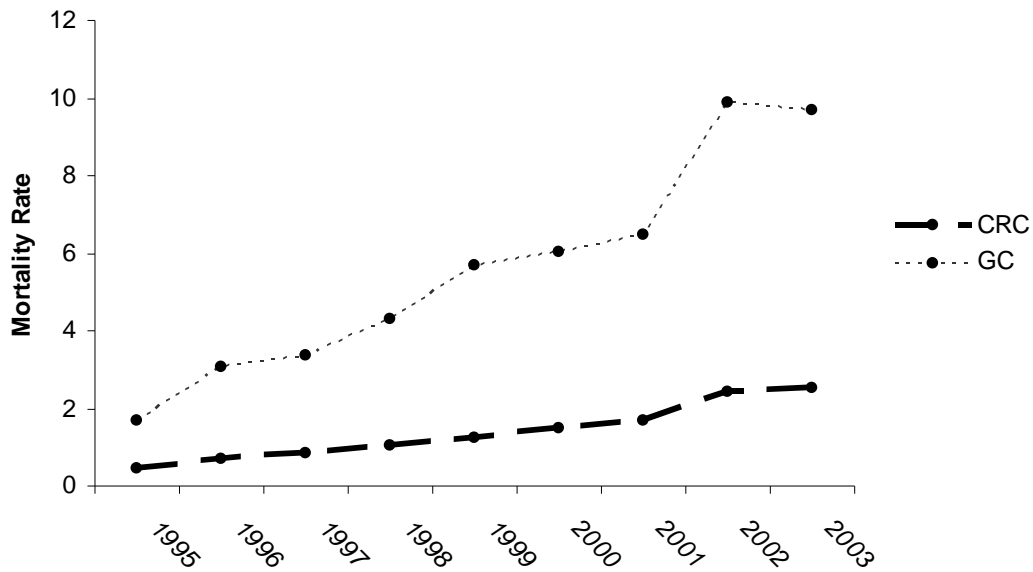
Figure1. Trends of CRC and GC mortality rate during the period 1995-2003
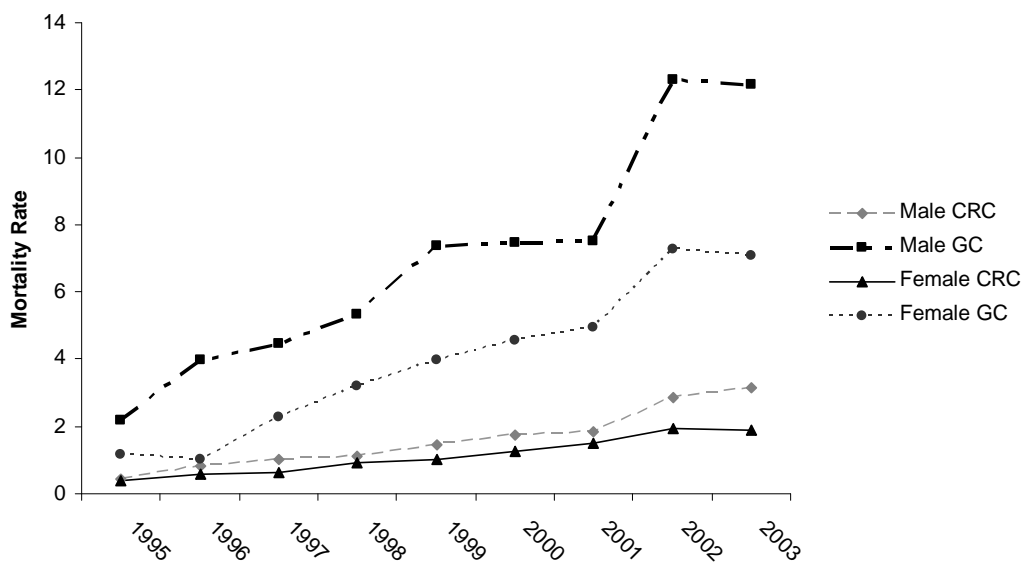

Figure2. Trends of CRC and GC mortality rate during the period 1995-2003 by sex groups

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 [19].

Results

All death records due to CRC and due to GC from 1995 to 2003 are included in this study. The crude mortality rate of CRC slightly increased during these years from 0.44 to 2.54 (Figure1). Moreover CRC

mortality was higher for male (Table 1 and Figure 2) and older age (Table 1 and Figure 3).

The crude mortality rates of GC showed a sharp increasing from 1.68 to 9.67 during the years of study, however a slight decreasing was observed between 2002 and 2003. In addition to this, GC mortality rates for male were higher comparing to female considerably (Table 2, Figure 2). Besides the mortality increased as age increased (Table 2 and Figure3) but for GC mortality in age upper than 50
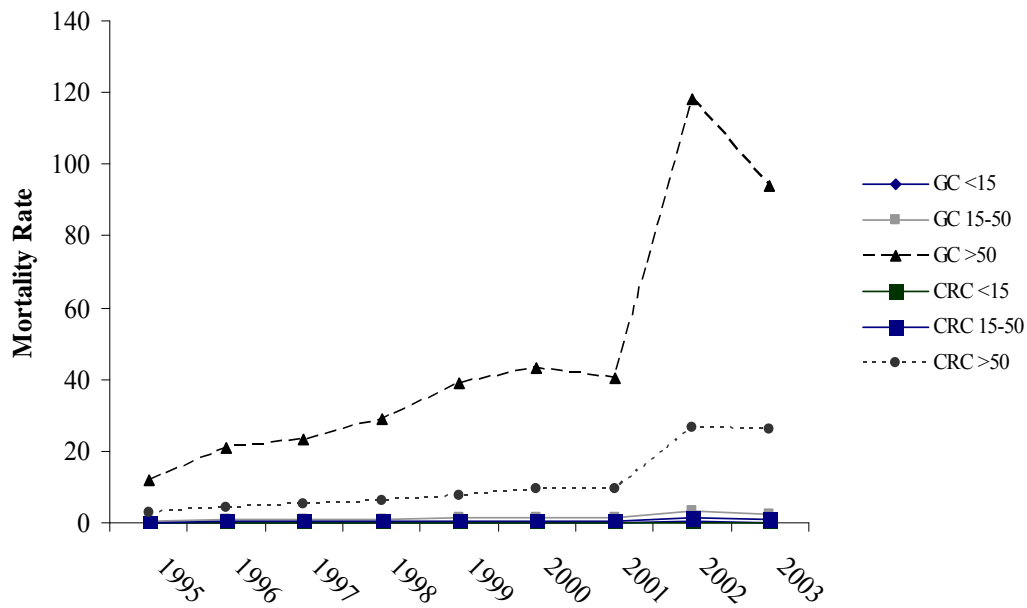
Figure3. Trends of CRC and GC mortality rate during the period 1995-2003 by age groups

years old, a slight decreasing occurred in 2003 compared to 2002.

Figure 2 and figure 3 showed that GC mortality rate was higher than CRC in Iranian population according to sex and age group.

A limitation of this study is underestimating of mortality for cancers in Iran due to poor registry [1]. Also we didn't access to crude data for all ages in order to give age-standardized mortality rates for international comparison.

Discussion

This study provides comprehensive projections for mortality rates due to GC and CRC based on the empirical data, indicating remarkable increasing trends in GC and CRC mortality in the period under study. Our findings are in contrast to European countries in which, the trends analyses showed that CRC and GC mortality decreased [20, 21].

Despite the universal decline in GC incidence and mortality, GC is still the second mortal cancer worldwide [13, 22]. The incidence of GC in Iran is still high [23, 24] and most of our patients with gastric cancer are diagnosed in a "non curable" stage [25, 26] with relative low survival rate [27], because the most patients are in advanced stage at the time of diagnosis [24] and no early detection strategy are ongoing in order to detect the patients in lower stage of disease. Also five years survival rate of gastric cancer has been reported to be 12.3%, which is lower than the world [27, 28].

The incidence of GC is strongly affected by environmental factors, diet, smoking, and Helicobacter pylori infection [20, 21, 29, 30]. It is expected that changes in these environmental factors, more attention to early diagnosis activities and improvement of treatment techniques are the reasons of why the worldwide declining trend in GC happened in the term of incidence [30,31] and mortality [32,33].

A specific GC national plan should be implemented that can decrease the incidence of gastric cancer including modification of diet and lifestyle and eradication of H. pylori [34] also developing a gastric cancer early detection program and preventing patient and system delays are recommended to decrease the trend of GC mortality [26,35] in Iranian population.

Our results revealed a constant increase in CRC mortality rates during the time period of the study, whereas in the North America which CRC incidence and mortality showed a trend towards declining [36] and an appreciable fall in mortality rate in the European Union was also registered [37], however in eastern Europe an increasing incidence and mortality rates has been reported recently [38].

The incidence of CRC is lower in Iran than in Western countries however, it increased remarkable over the last three decades [39, 40]. Besides, five year survival rate of CRC has been reported to be 47.36% which is lower than the world [41, 42].

Currently, CRC incidence is still lower in older Iranians; however, the incidence is close in young Iranians and Americans [41] so this similarity and the linear increasing trend of its mortality during these recent years and predicting to experience a higher incidence in future indicated that the population may be experiencing an acceleration of the its burden in future [43].

The access of screening for CRC is very negligible in Iran and in many other developing countries which is due to cost and problems in healthcare system [44]. So it is recommended that in Iran screening be started in order to reduce the incidence and control the mortality and burden of CRC in future.

Acknowledgment

Conflict of Interest

None to declare

Authors' Contribution

MAP conceived and designed this study and interpreted the results and drafted the manuscript. SF, EH and GG participated in writing and revise the manuscript. MRZ and AA contributed to data gathering and approved the final manuscript. All authors read and improved the final manuscript.

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