RESEARCH COMMUNICATION

Time Trends in the Occurrence of Major GI Cancers in Iran

Bahareh Yazdizadeh¹, Alireza Mosavi-Jarrahi¹², Hossein Mortazavi³, Mohammad Ali Mohagheghi¹, Soroush Tahmasebi¹, Azin Nahvijo¹

Abstract

Objective: The aim of this study was to study the changes in occurrence of esophageal, stomach and colon cancers (cancers of interest) over the last 30 years in Iran.

Material and Methods: Cancer cases referred to two main cancer centers in the country (the Shiraz cancer center and the Tehran cancer center) during last 30 years and published by the two centers were utilized. Morbidity odds ratios (MOR) were used to study trend in the occurrence of each cancer site in each center. For this purpose the cancers of interest were considered as cases; childhood cancers as controls; and calendar year as exposure. A regression line was fitted to morbidity odds ratios over years and the slope of the regression line was considered to indicate the overall trend. MORs and 95% CIs comparing the last five and first five years were computed to measure the magnitude of the change over time.

Result: The overall trend for esophageal cancer was decrease (slopes = -0.02 for Shiraz and -0.03 for Tehran); for stomach was increase (slopes = 0.04 for Shiraz and 0.08 for Tehran), and for colon cancer was sharp increase (slopes = 0.02 for Shiraz and 0.10 for Tehran). The magnitude of changes showed stomach cancer to increase by 35% in Shiraz (MOR = 1.35 with 95% CI 1.1, 1.65) and 13% in Tehran (MOR = 1.13 with 95% CI 0.96, 1.38), esophageal cancer to decrease by 20% in Shiraz (MOR = 0.82 with 95% CI 0.62, 1.11) and 50% in Tehran (MOR = 0.52 with 95% CI 0.45, 0.60), and colon cancer to increase by 65% in Shiraz (MOR = 1.65 with 95% CI 1.26, 2.16) and 82% in Tehran (MOR = 1.82 with 95% CI 1.52, 2.25).

Conclusion: During the last thirty years the occurrence of major GI cancers has changed in Iran with sharp increase in colon cancer, slight to moderate increase in stomach cancer and sharp decrease in esophageal cancer.

Key Words: Cancer - time trends - esophagus - stomach - colon - Iran

Introduction

Cancers of upper gastrointestinal tract, mainly esophagus and stomach are the most frequent cancers in Iran (Mosavi-Jarrahi et al., 2001). The existence of geographic variation in the frequency of GI cancer in the country has been noted since the first report on high rate of esophageal cancer in north-eastern part of Iran was published (Kemet and Mahboubi, 1972). The variations seen in the incidence of different cancers in the country have been subject of interest among epidemiologist, both locally and internationally. There is consensus among Iranian epidemiologists to divide the country into two regions for cancer incidence, the Caspian littoral for high rates of upper GI cancer mainly esophagus and gastric cancers, and other parts of the country with low rates of esophageal cancers and high rate of skin cancers and malignancy of lymphoproliferative and hemopoietic systems (Mosavi-Jarrahi et al., 2001).

However, certain changes in patterns of cancer occurrence are anticipated, especially since the country has transformed from a static-agricultural society to a dynamic-urban society during the last 50 years.

Epidemiologic investigations of major GI cancers in the countries where reliable cancer registry is available have generated data demonstrated certain trends in incidences, mainly lowering cancers of esophagus and stomach and increase in the incidence of colon and lower GI cancers (Muir and Nectoux, 1996). Although, there are recent population data regarding the incidence of GI cancers in Iran, due to lack of population based cancer registries, monitoring the changes in cancer morbidity and mortality over years is not as straight-forward as comparing rates at different times and

¹The Cancer Institute Research Center, the Imam Khomeini Medical Center. ²Dept. of Social Medicine, Medical School, Shaheed Beheshti University of Medical Sciences. ³Dept. Radiation Oncology, Jorjani Hospital, Shaheed Beheshti University of Medical Sciences. Corresponding Authors Address: Alireza Mosavi-Jarrahi, P.O. Box 18575-4194, Tehran, I. R. of Iran Tel: +98-21-23872567 Fax: +98-21-6428655 rmosavi@yahoo.com

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other methodologies need to be employed. The aim of this study was to study the changes of GI cancer occurrence over the last 30 years in Iran by utilizing large case series reported by two major cancer centers.

Materials and Methods

The Data

Two large cancer case series compiled in two main referral centers in the country were utilized. The centers are located in the city of Shiraz (located in the central part of Iran) and Tehran. The two have been referral centers providing comprehensive cancer treatment and diagnosis to the population residing in their geographically adjacent areas. The data of the Shiraz center (Salabian, 1972-1995) included 19276 cases of cancer referred to the center from 1976 till 1995. The Shiraz data were abstracted from yearly-published reports of the center. The Tehran data was available in electronic format and it included 16383 cases referred to the center from 1972 till 1995 (Mortazavi et al., 1995).

The Analyses

Analyses were done for the cancers of esophagus, stomach, and colon. Morbidity odds ratio was used to analyze the data. For this purpose, cancers of interest (esophagus, stomach, and colon) were considered as cases. The childhood cancers (all cancers of age less than 15 years) were considered as controls. Calendar years were considered as exposure and the reference for exposure were the first-three-years. Each consecutive year was compared to the first three years and morbidity odds ratios were calculated for each year. The yearly odds ratios were plotted against calendar years and a linear regression line was fitted to the odds ratios over years. The slope of the line was considered as an “overall trend” in the occurrence of cancers of interest during the period studied. In order to quantify the magnitude of the changes in occurrence of each cancer, morbidity odds ratios comparing the first five years with the last five years were calculated for each site in each center. 95% confidence intervals were calculated for the odds ratios. Analysis was done using Excel Microsoft software.

Results

During the years of study, a total of 5213 cases of esophageal, stomach and colon cancers referred to the two centers compromising 18% of Tehran referred cases and 12% of Shiraz referred cases. Table 1 shows the frequency of cancers of interest with the corresponding frequency of childhood cancers in each center. The result of analytical analysis for each cancer is as follow:

Esophageal Cancer

During the years of study, total of 2462 cases of esophageal cancers were referred to the two centers compromising 10% of cancers in the Tehran center and 4% of cancers in the Shiraz centre. In both centers, the overall occurrence of esophageal cancer sharply decreased (Figure 2). The decrease was more in Tehran compared to Shiraz. (The slope of regression was - 0.11 for Tehran, and - 0.03 for Shiraz). The magnitude of this reduction as measured by comparing the last five years to the first five years was; 48% for Tehran and 18% for Shiraz (Table 2).

Stomach Cancer

During the years of study, total of 1516 cases of stomach cancers were referred to the two centers compromising 4% of cancers in the Tehran and 9% of cancers in the Shiraz centre (Table 1). In both centers, the overall occurrence of stomach cancer slightly increased (Figure 2). The increase was almost the same for the two centers (the slope of regression was + 0.08 for Tehran, and +0.03 for Shiraz). The magnitude of this increase as measured by comparing the last five years to the first five years was; 13% for Tehran and 35% for Shiraz (Table 2).

Colon Cancer

During the years of study, total of 1232 cases of colorectal cancers were referred to the two centers compromising 3% of cancers in the Tehran and 4% of cancers in the Shiraz centre (Table 1). In both centers, the overall occurrence of colorectal cancer increased (Figure 3). The increase was more in Tehran compared to Shiraz (the slope of regression was + 0.12 for Tehran, and +0.02 for Shiraz). The magnitude of this increase as measured by comparing the last five years to the first five years was; 82% for Tehran, and 65% for Shiraz (Table 2). The magnitude of increase was statistically significant (odds ratio =1.82 with 95%CI of 1.52, 2.25 for Tehran and odds ratio = 1.65 with 95% CI of 1.26, 2.16 for Shiraz).

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>Shiraz center OR (95%CI)</th>
<th>Tehran center OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>1.35 (1.1 , 1.65)</td>
<td>1.13 (0.93 , 1.38)</td>
</tr>
<tr>
<td>Esophagus</td>
<td>0.82 (0.62 , 1.11)</td>
<td>0.52 (0.45 , 0.60)</td>
</tr>
<tr>
<td>Colorectal</td>
<td>1.65 (1.26 , 2.16)</td>
<td>1.82 (1.52 , 2.25)</td>
</tr>
</tbody>
</table>

Table 2. The Odds Ratios Comparing the First Five with the Last Five Years for the Cancers of Interest in the Two Centers
**Discussion**

Our study demonstrated changes in occurrence of major GI cancers over the last thirty years in Iran. After skin and breast, the cancers of upper GI are the most frequent cancer in Iran; the incidence of esophageal cancer has been estimated 6.4 per 100,000 in Tehran population and 15.4 per 100,000 in Ardabil (a city located in northwestern part of Caspian littoral) based on recent cancer registry reports (Alireza et al., 2003; Mohagheghi and Mosavi-Jarrah, 1998). Time trend using incidence data has shown that since 1955, the incidence of esophageal cancer has decreased in Singapore, has been stable in Japan and increased in Male population of New Zealand (Coleman et al., 1993). In countries located in the “Asian esophageal cancer belt”, the incidence of esophageal cancer has decreased; the decrease has been
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In conclusion, our study demonstrated that during last thirty years the incidence of esophageal cancer has decreased, the rate of stomach cancer slightly increased and colon cancer incidence sharply increased in Iran.

References


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