

COLORECTAL CANCER EPIDEMIOLOGY IN AN AREA WITH A SPONTANEOUS SCREENING PROGRAM

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[Epidemiologia del cancro colo-rettale in un'area con screening spontaneo]

ABSTRACT

The aim of this study was to analyze and describe the epidemiological characteristics and trends of colorectal cancer in Sassari province (Sardinia, Italy), an area with a spontaneous surveillance program for colorectal malignancies, in the period 1992–2010. Data were obtained from the local tumor registry which makes part of a wider registry web, coordinated, today, by the Italian Association for Tumor Registries. The overall number of colorectal cancer cases registered was 4.284. The male-to-female ratio was 1:0.7 and the mean age 68.3 years for males and 69.4 years for females. The standardized incidence rates were 49.3/100,000 and 31.1/100,000 and the standardized mortality rates 20.4/100,000 and 12.4/100,000 for males and females respectively. An increasing trend in the incidence of colorectal cancer in Sassari province was evidenced. Relative survival at 5 years from diagnosis was 48.6% (52.3% for males and 44.7% for females). A slight increase in mortality rates was observed, as opposed to national figures, probably attributable to the lacking of organized screening strategies in the area.

Key words: Colorectal cancer, adenocarcinoma, screening, surveillance, Sassari.

Received March 11, 2013; Accepted March 26, 2013

Introduction

Colorectal cancer is one of the most common neoplastic diseases in the world with more than 1,200,000 cases in 2008⁽¹⁾. It is the third most incident neoplastic disease in both sexes, after lung and prostate cancer in men and breast and cervix cancer in women⁽¹⁾. It also represents the fourth most frequent neoplastic cause of death after lung, stomach and liver cancer⁽¹⁾. A consistent and worldwide increase in colorectal cancer was registered in the last decades^(2,3). This increase may reflect technological improvements in modern diagnostic methods and changes in dietary habits and other risk factors, as well as continuous improvement of the expectancy of life^(3,4,5). Otherwise, the progressive adoption of screening programs in western countries, useful to identify individuals with pre-symptomatic neoplastic colorectal lesions, should reduce the mortality for colorectal cancer^(4,6,7).

The aim of this population-based study was to analyze and describe the epidemiological character-

istics and trends of colorectal cancer in the province of Sassari (Sardinia, Italy), in the period 1992–2010.

Materials and methods

The epidemiological data presented in this article were obtained from the “Registry of the tumors of the Province of Sassari”. This registry was created in 1992 by the local health agency for the epidemiological surveillance of tumors. In 1999 it became part of a wider web of tumor registries, coordinated, today, by the Italian Association for Tumor Registries (Associazione Italiana Registri Tumori, AIRTUM). The association coordinates 34 registries in the country, collects and publishes data, and collaborates with international organizations in the field.

Every registry collects data on tumoral diseases affecting inhabitants in the territory of jurisdiction through the local hospitals and health care services, as with other registries (e.g., death regi-

stries). Demographic, clinical, pathological and prognostic data are collected for each case of cancer and are registered in a digital database. This database was the data source for the present population-based report.

The demographic characteristics of the patients affected by colorectal cancer were collected. Crude incidence and mortality rates per 100,000 inhabitants per year were calculated, as were the standardized rates adjusted for European population standards. A comparison between incidence and mortality in the province of Sassari and those in other Italian provinces was performed. Additionally, the cumulative risk of developing the disease and of dying between zero and 74 years of age was estimated. The age class distribution and time trends of incidence, mortality, and histology were also evaluated. Finally, relative 5-year survival was calculated.

Results

The overall number of cases of colorectal cancer registered in the period under investigation was 4,284. Diagnosis was obtained by histological or cytological reports in 3,945 cases (92.1%) and using other information sources (clinical reports, radiological referrals, death certifications, etc) in 326 cases (7.6%). The modality of diagnosis was not known in 13 cases (0.3%). Among the 4,284 individuals registered, 2,419 were males and 1865 females, with a male-to-female ratio of 1:0.77. The mean age was 68.3 years for males and 69.4 years for females. The cumulative risk of developing the disease was 4.09% for males and 2.44% for females.

As regards the anatomical distribution of the tumors 959 (22.4%) were sited in the right colon, 177 (4.1%) in the transverse colon, 427 (10%) in the left colon, 1,068 (24.9%) in the sigmoid colon and 1,422 (33.2%) in the rectum and anus, while in 231 (5.4%) cases the anatomical site of origin was not known. Among the 3,945 tumors that had histological or cytological diagnosis, 3785 (95.9%) were adenocarcinomas, while only 97 (2.5%) were lesions of a different histotype. In the remaining 63 (1.6%) cases the exact histologic type was not specified.

The crude incidence of colorectal malignancies in the period under investigation was 58.9/100,000 for men and 43.9/100,000 for women. Standardized incidence rates were 49.3/100,000 for males and 31.1/100,000 for females.

Table 1 shows the distribution of incidence in relation to age in percentages, while Table 2 shows the distribution of incidence rates in relation to age. Peak incidence occurred at 80-84 years for both males and females. Incidence rates were also calculated for the following three time periods: 1992-1998, 1999-2004 and 2005-2010 (Figure 1). There was a progressive increase in incidence rate in males, from 41.35/100,000 in the first period, to 50.47/100,000 in the second period and 56.76/100,000 in the last period. The corresponding figures for females were 27.5/100,000, 30.75/100,000 and 35.44/100,000, respectively. A steady increase in incidence occurred between 1992 and 2010. Analysis of the trend of mean age at disease onset for the same periods of time did not reveal any relevant changes (Figure 2).

Age (years)	Males (Incidence %)	Females (Incidence %)
0-14	0	0
15-29	0.16	0.43
30-44	3.27	3.59
45-59	17.3	17.27
60-74	48.7	40.16
75+	30.84	38.55

Table 1: Age-class incidence distribution.

Age (years)	Incidence (/100,000)		(Incidence) (/100,000)	
	Males	Females	Males	Females
0-14	0	0	0	0
5-9	0	0	0	0
10-14	0	0	0	0
15-19	0	0.4	0.4	0
20-24	0.3	0.7	0	0
25-29	0.9	1.6	0	0.3
30-34	4.7	3.5	0.3	0.9
35-39	5.1	5.1	2.4	0.9
40-44	14.5	12	3.8	1.9
45-49	25.4	19.1	8.1	5.1
50-54	50.3	43.9	13.7	9.9
55-59	81.4	56.8	30	17.9
60-64	141.8	89.8	39.2	27.1
65-69	213.7	121.5	76.9	44.6
70-74	294.7	140.3	113.5	62.5
75-79	312.4	184.3	165.4	85.1
80-84	378.1	229.4	212.2	125.4
85+	284.3	215.4	274.4	207.8
Total	58.9	43.9	25.1	19.7

Table 2: Age-class incidence and mortality rates.

	Males		Females	
	Incidence	Mortality	Incidence	Mortality
Alto Adige	65.7	29.3	42.3	16.3
Biella	59.3	26.9	37.4	15.9
Ferrara	75.6	31.8	46.8	18.6
Firenze	70.2	24.7	45.5	17.5
Friuli VG	74	29.7	46.5	15.1
Genova	67	28.1	43.1	14.4
Macerata	60.1	26.4	38.2	15.3
Modena	66.2	26.2	42.3	16.7
Napoli	42.6	19.5	28.7	12.3
Parma	63.6	23	38.5	12.1
Ragusa	48.7	20.5	31	12.9
Reggio E	64.6	22.2	41.1	17.1
Romagna	68.5	25.3	43.5	16
Salerno	42	16.3	27.9	11.4
Sassari	49.3	20.4	31.1	12.4
Torino	63.8	26.4	39.1	12.7
Trento	63.8	29	39.3	17.6
Umbria	69.9	25	45.5	15.7
Varese	62.5	27.8	38.3	13.6
Veneto	63.9	25	40.2	15.9
Mean	64.5	25.3	40.6	15.1

Table 3: Comparison with incidence and mortality rates of other Italian provinces.

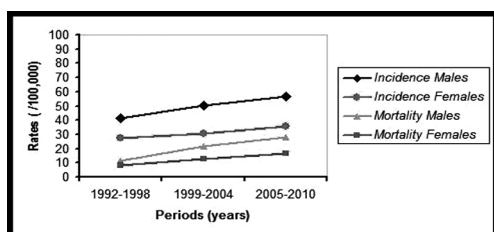


Figure 1: Incidence and mortality rates trends.

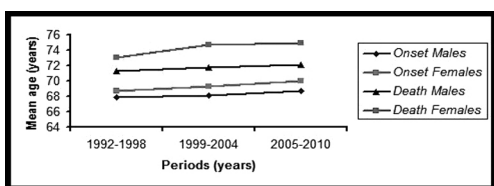


Figure 2: Trends of mean age at disease onset and death.

Table 3 shows the comparison of the incidence and mortality in the province of Sassari with those in other Italian provinces. There were 1868 deaths in the period under investigation (1032 males and 836 females). Crude overall mortality was 25.1/100,000 for males and 19.7/100,000 for females. Mean age at death was 71.8 years in males and 74.5 years in females. Standardized mortality rates were 20.4/100,000 for males and 12.4/100,000 for females. The cumulative risk of death was rela-

tively low (1.43% for males and 0.85% for females). Table 2 shows the age-class distribution of mortality rates. There was a relevant increase in mortality rates after the sixth decade of life. Figure 1 shows the time trend of mortality between 1992 and 2010: a significant increase in mortality was registered. Finally, relative survival at 5 years from diagnosis was 48.6% (52.3% for males and 44.7% for females).

Discussion

Colorectal cancer is the third most incident neoplastic disease in the world, after lung and breast cancer, with more than 1,200,000 cases in 2008⁽¹⁾. World population age-standardized incidence calculated for the same year was 17.2/100,000 (20.3/100,000 for men and 14.6/100,000 for women), while cumulative risk was 1.96%⁽¹⁾. Colorectal cancer is also the fourth most frequent cause of neoplastic death, with more than 600,000 deaths in the world in 2008⁽¹⁾.

Large part of these figures seems to involve the most developed countries. In the European Union more than 300,000 cases of colorectal cancer were estimated in 2008, with a standardized incidence of 31.7/100,000 inhabitants (39.9/100,000 for men and 25.2/100,000 for women). There were approximately 150,000 deaths, with standardized mortality rate of 12.6/100,000 (16.3/100,000 for males and 9.7/100,000 for females). The highest figures were observed in countries of the central Europe (Slovakia, Hungary, Czech Republic)^(1,4). Italy is one of the European countries with relatively high colorectal cancer incidence, while Italian figures for mortality are within mean European values. In 2008, more than 50,000 cases were observed in the country and standardized incidence and mortality rates were 35.5/100,000 and 11.7/100,000 respectively. In the same year more than 19,000 deaths for colorectal cancer were estimated in the country⁽¹⁾. Data collected by AIRTUM (Table 3) show slightly higher figures than those reported by Globocan.

Standardized incidence rates in the province of Sassari were lower than those estimated for the entire country (Table 3). Comparisons of the incidence rates with those of other Italian provinces place our province between those with low incidence rates, such as Napoli and Salerno. Provinces with higher incidences, like Ferrara, Friuli Venezia Giulia and Firenze, were generally northern ones.

These figures may be probably due to dietetic factors, such as diffuse consumption of quality aliments, especially vegetables, oil and wine.

Considering the distribution of the disease in relation to age, less than 10% of the cases occurred in individuals ≤ 30 years, while more than 75% occurred after the sixth decade of life. Incidence rates increased with aging in both sexes, reaching peak values in individuals ≥ 80 years.

The time trends analysis showed a steady increase in incidence in Sassari province in the period under investigation. This trend is common to several national and international geographical areas, which have contributed to the global increase in the number of new colorectal cancer cases reported in literature. It is not clear whether this is a real increase in incidence or whether it reflects a general advancing in the technological means employed for diagnosis, an improvement and diffusion of endoscopic culture, or a progressively wider adoption of surveillance programs in western countries.

Concerning mortality, 1868 (1032 males and 836 females) deaths occurred in the 18 years we studied. Standardized mortality rates were considerably lower for women and globally lower to those observed in most provinces in Italy, but higher than some recent European and world estimates⁽¹⁾. Considering the age-class mortality trend, a natural increase in relation to age could be observed in both sexes, with peaks after the eighth decade of life and with a slight increase between 1992 and 2010.

Screening strategies, both with faecal occult blood tests or colonoscopy, can progressively reduce colorectal cancer mortality, especially if adequately organized^(6,8). Indeed, in the United States, where organized screening programs have been started earlier, mortality rates are significantly lower than in European or Asian countries that adopted surveillance programs later. In our province surveillance is performed through a spontaneous system adopted in the last decade, with no charges for a faecal occult blood test and/or a colonoscopy for individuals ≥ 50 years; an organized screening program for colorectal cancer is not yet available. This may be the explanation of a slightly increasing mortality trend observed in the area in the last two decades, as adherence rates to spontaneous campaigns can be considerably variable. Conversely, a slight reduction in mortality rates for colorectal cancer was globally observed in Italy in the last decades, both for males and females, parallel to a progressively increasing num-

ber of screening programs in the various provinces of the country^(9,10). Finally, relative survival at 5 years from diagnosis was relatively low (48.6%), furthermore suggesting the need to enhance primary prevention.

Conclusions

Our data point out an increasing trend in incidence of colorectal cancer in Sassari province in the last decades. However, incidence rates were lower than those of other Italian provinces, especially those of north Italy. Furthermore, a slightly increasing trend in mortality rates was observed in both sexes, as opposed to national figures, probably attributable to the lacking of organized screening strategies in Sassari province.

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