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BREAST CANCER INCIDENCE AND MORTALITY IN NORTH SARDINIA IN THE PERIOD 1992 - 2010

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[Incidenza e mortalità del cancro della mammella nel nord Sardegna nel periodo 1992 -2010]

ABSTRACT

The aim of this study was to analyze and describe the epidemiological characteristics and trends of breast cancer in Sassari province (Sardinia, Italy) 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 breast cancer cases registered was 5,483 (46 males and 5,437 females). The mean age was 64.8 years for males and 60.4 years for females. The standardized incidence rates were 1/100,000 and 106.2/100,000 and the standardized mortality rates 0.3/100,000 and 23.2/100,000 for males and females respectively. An increasing trend in incidence and mortality rates of breast cancer in Sassari province was evidenced in the years under investigation. Relative survival at 5 years from diagnosis was 78.2% (73.1% for males and 78.3% for females).

Key words**:** *Breast cancer, ductal, lobular, screening, Sassari, Italy.*

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Introduction

Breast cancer is one of the most common neoplastic diseases in the world with more than 1,380,000 cases among females estimated in 2008[1]. It is the first most incident neoplastic disease and the first neoplastic cause of death in women[1]. An increase in breast cancer incidence in women was registered worldwide in the last decades; given the current incidence trends it is estimated that in 2030 there will be approximately 2.7 million cases of breast cancer in the world[2]. This increase may reflect technological improvements in modern diagnostic methods, changes in reproductive and oral contraceptive use patterns and continuous improvement of the expectancy of life, especially in countries that until recently had low rates of the disease[3]. Conversely, a reduction in mortality rates was registered in developed countries in recent years, probably because of the progressive adoption of screening programs, useful to identify individuals with presymptomatic neoplastic lesions, and advances in the oncological management of breast cancer[2,4]. These trends were observed also in Italy in recent years[5].

The aim of this population-based study was to analyze and describe the epidemiological characteristics and trends of breast 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 the province. 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 associa-

tion 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 registries). 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 breast cancer were collected. Crude incidence and mortality rates per 100,000 inhabitants per year were calculated, as were 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 breast cancer registered in the period under investigation was 5,483. Diagnosis was obtained by histological or cytological reports in 5,268 cases (96%) and using other information sources (clinical reports, radiological referrals, death certifications, etc) in 201 cases (3.7%). The modality of diagnosis was not known in 14 cases (0.3%). Among the 5,483 cases registered, 46 occurred in males (0.8%) and 5,437 (99.2%) in females. The mean age was 64.8 years for males and 60.4 years for females. The cumulative risk of developing the disease was 0.07% for males and 8.46% for females.

As regards the anatomical distribution of the tumors 338 (6.2%) were sited in the nipple, 84 (1.5%) in the central quadrant, 2035 (37.1%) in the upper-outer quadrant, 515 (9.4%) in the upper-inner quadrant, 320 (5.8%) in the lower-inner quadrant and 391 (7.1%) in the lower-outer quadrant, while 876 (16%) lesions involved more than one quadrant. In 924 (16.9%) cases the anatomical site of origin was not known. Among the 5,268 tumors that had a histological or cytological diagnosis, 66.5% were ductal carcinomas, 10.9% lobular carcinomas, and 20.7% other histotypes. In 102 cases (1.9%) the exact histologic type was not known.

The crude incidence of breast malignancies in the period under investigation was 1.1/100,000 for men and 128/100,000 for women. Standardized incidence rates were 1/100,000 for males and 106.2/100,000 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 males and 70-74 years for females. Incidence rates were also calculated for the following three time periods: 1992-1998, 1999-2004 and 2005-2010. There was a progressive increase in incidence rate in males, from 0.43/100,000 in the first period, to 1.05/100,000 in the second period and 1.45/100,000 in the last period. The corresponding figures for females were 87.28/100,000, 105.33/100,000 and 128.76/100,000, respectively (Figure 1). A steady increase in incidence occurred between 1992 and 2010 in both sexes. Furthermore a consistent increase in the diagnosis of ductal carcinomas was observed in both sexes in the same years (Figure 2).

Age (years)	Males (Incidence %)	Females (Incidence %)
0-14	0	0
15-29	0	0.63
30-44	8.69	14.27
45-59	26.09	33.07
60-74	36.96	34.04
75+	28.26	17.99

Table 1: Age-class incidence distribution.

Table 3 shows the comparison of the incidence and mortality rates in females in the province of Sassari with those in other Italian provinces. There were 1,358 deaths in the period under investigation (15 males and 1,343 females). Crude overall mortality was 0.4/100,000 for males and 31.6/100,000 for females. Mean age at death was 68.1 years in males and 67.9 years in females.

Age (years)	Incidence/100,000		Mortality/100,000	
	Males	Females	Males	Females
0-4	0	0	0	0
5-9	0	0	0	0
10-14	0	0	0	0
15-19	0	0	0	0
20-24	0	0.7	0	0
25-29	0	9.9	0	0
30-34	0	27.3	0	3.5
35-39	0	68.3	0	8.1
40-44	1.3	143.4	0	12.9
45-49	1.4	201.1	0.3	27.6
50-54	2.2	210.5	0.4	38.1
55-59	0.8	246.1	0.8	42
60-64	2.2	251.8	0.9	57.2
65-69	4.2	300.8	1	82.8
70-74	2.6	308.4	1.3	92
75-79	6.4	297.6	2.8	113.3
80-84	7.2	295.8	1.4	129.2
85+	2	235.9	2	182.9
Total	**1.1**	**128**	**0.4**	**31.6**

Table 2: Age-class incidence and mortality rates.

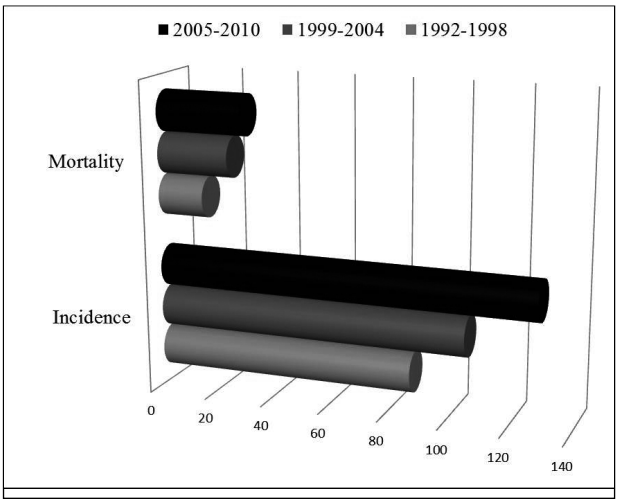

Figure 1: Incidence and mortality rates trends in females (1992 - 2010).

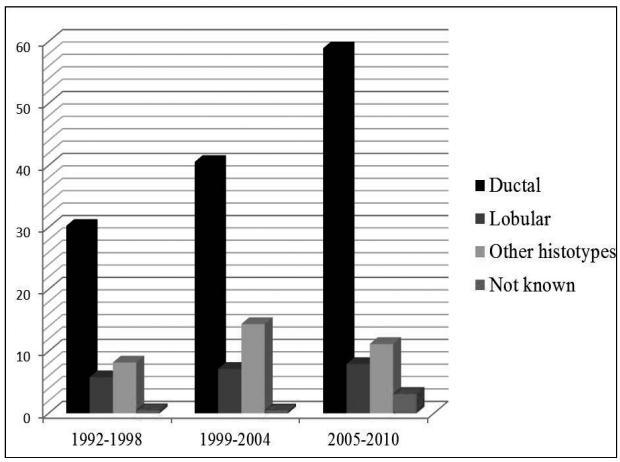

Figure 2: Trends of the principal histological types (1992 - 2010).

Province	Incidence	Mortality
Alto Adige	99.4	25.3
Biella	111.9	27.1
Ferrara	136	30.9
Firenze	116.5	22.9
Friuli VG	119.8	29.4
Genova	116.4	26.7
Macerata	89.6	27
Modena	133	26.4
Napoli	81	21.4
Parma	129.9	26.2
Ragusa	83	23.5
Reggio E	129.7	26.6
Romagna	123.6	23.1
Salerno	79.3	20.9
Sassari	106	23.2
Torino	120.2	29.2
Trento	107.6	29.7
Umbria	107.7	22.5
Varese	124.9	24.2
Veneto	118.7	28.7

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

Standardized mortality rates were 0.3/100,000 for males and 23.2/100,000 for females. The cumulative risk of death was low in men (0.02%) and significantly higher in women (1.8%). Table 2 shows the age-class distribution of mortality rates. There was a relevant increase in mortality rates after the seventh decade of life. Figure 1 shows the time trend of female mortality between 1992 and 2010: a significant increase was registered. Finally, relative survival at 5 years from diagnosis was 78.2% (73.1% for males and 78.3% for females).

Discussion

Breast cancer is the most incident neoplastic disease in women in the world, with more than 1,380,00 cases estimated in 2008[1]. World population age-standardized incidence in women calculated for the same year was 38.9/100,000, while cumulative risk was 4.13[1]. Breast cancer is also the most frequent cause of neoplastic death in women, with more than 450,000 deaths in the world in 2008[1]. Large part of these figures seems to involve the most developed countries worldwide. In the European Union more than 420,000 cases of breast cancer were estimated in 2008, with a standardized incidence of 66.7/100,000 inhabitants. There were approximately 130,000 deaths, with a standardized mortality rate of 16.9/100,000 cases. The highest figures are observed in northern and western European countries[1].

Italy is the country with higher incidence rates in South Europe. In 2008, more than 47,000 cases were observed in the country and standardized incidence and mortality rates were 86.3/100,000 and 16.1/100,000 respectively[1]. In the same year more than 11,000 deaths for breast cancer were estimated in the country[1]. In Italy, breast cancer comprises approximately one third of the overall female cancers, with relevant variations in incidence between northern (127.2/100,000), central (100.1/100,000) and southern regions (91.6/100,000)[5]. This heterogeneity may be due to a different diffusion of risk factors and organized screening programs in the territory. Given the continuous increment of the expectancy of life, an increase in incidence of breast cancer in Italy is estimated, with more than 50,000 expected in 2020[5]. Conversely, a slight but steady reduction of mortality rates was observed in the last two decades (-1,7%/year) in the country[5].

Standardized incidence rates in the province of Sassari were similar than those estimated for the central Italian regions. Comparisons of the incidence rates with those of other Italian provinces place our province between those with low rates, such as Salerno and Napoli. Provinces with higher incidences, like Ferrara e Modena, were indeed northern ones (Table 3).

Considering the distribution of the disease in relation to age, less than 1% of the cases occurred in individuals ≤30 years, while more than 50% occurred between 45 and 75 years of age. Peak incidence occurred at 80-84 years for males and 70-74 years for females.

The time trends analysis showed a steady increase in incidence in Sassari province in the period under investigation. This trend is common to numerous national and international geographical areas. 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 and a progressively wider adoption of surveillance programs in developing countries. Furthermore, a continuous increase in breast cancer incidence rates in Sassari province in the last 35 years is evidenced, taking into account previous epidemiological surveys reporting data obtained in the periods 1974-1985 and 1992-2002; figures for crude incidence were 43.4/100,000 and 106/100,000 respectively[6,7]. Our data evidenced an increase in crude incidence to 128.8/100,000 in the period 2005-2010.

As regards histology, a relevant increase of ductal carcinomas was observed from 1992 to 2010. Considering previous reports, the percentage of ductal carcinomas was globally reduced in the last 35 years, as it accounted for 82% of all cases in the period 1974-1985, 65.2% in the period 1992 - 2002, and 58.8% in the period 2005 - 2010[6,7]. A slight increment of lobular and other malignancies was, furthermore, evidenced in the last 18 years.

Concerning mortality, 1,358 (15 males and 1,343 females) deaths occurred in the 18 years we studied. Standardized mortality rates were 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 was observed in both sexes, with peaks after the eighth decade of life. Time trend analysis evidenced an increase in mortality rates in the period under investigation, despite the existence of an organized screening program in the area. This suggests that surveillance, clinical and oncological health care

services must be further improved in order to obtain reduction of mortality in breast cancer patients in North Sardinia.

Conclusions

Our data showed an increasing trend in incidence of breast cancer in Sassari province in the last decades. Furthermore, an increase in mortality rates was observed, as opposed to national figures. This suggests that surveillance, clinical and oncological health care services must be improved in order to obtain reduction of mortality in breast cancer patients in North Sardinia.

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