

Epidemiology of malignant breast tumors in the province of Sassari (Sardinia, Italy) in the period 1992-2002

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Summary

The aim of this study was to evaluate the incidence of malignant breast tumors in the Province of Sassari, Sardinia (Italy) in the period 1992-2002 and to report the variations in comparison to the 1974-1985 period. The analysis of our data showed that the overall number of malignant breast tumors was more than doubled from 1,139 cases in the period 1974-1985 to the 2,735 cases in the period 1992-2002, and the mean rate/100,000 changed from 43.4 to 106.0. The incidence in the age classes 45-64 years, which were at enhanced risk for breast cancer, was globally increased, changing from 143.6/100,000 to 198.7/100,000. On the other hand, the incidence in the youngest age classes (30-34 yrs) was reduced from 59.5% to 27.0%. The analysis of the histotypes showed a relative reduction of ductal carcinoma in the period 1992-2002 in comparison to the previous period 1974-1985 (65.2% vs 82.0%) whereas the incidence of anaplastic forms increased in advanced ages of life. We reported an important reduction of T0 tumors from 3.4% to 0.1%. These data could be due to the low diffusion of screening programs in Sardinia. Tumor metastases were more frequent in advanced age classes. In conclusion, the worrying data of the strong reduction of T0 cases, the increased age of first diagnosis and the advanced forms with positive nodal metastases showed that the prevention program has not been yet well organized.

Key words: Malignant breast tumors; Incidence; Province of Sassari (Sardinia, Italy).

Introduction

Malignant breast tumors have been continuously increasing in Western countries [1].

The marked increase in the incidence of breast tumors in recent years and decrease in female mortality due to this tumor point out the consistent improvement of the diagnosis due to widespread systematic screening by mammography [2].

In a previous paper [3] we evaluated the incidence of carcinoma of the breast in the Province of Sassari from 1974-1985 and reported a consistent increase of this tumor in comparison to the previous period. In fact, we registered an almost triplicate incidence in comparison to previous years with an incidence that was at the highest level in Western countries.

The aim of this study was to evaluate the incidence trend and epidemiological characteristics of malignant breast tumors in our Province in the period 1992-2002 and to report the variations in comparison to the 1974-1985 period [3].

Materials and Methods

In this collaborative study by the Obstetric and Gynecologic Clinic, the Institute of Anatomy and Histopathology of Sassari University, the Multizonal Epidemiologic Observational Center of Local Health Unit no. 1 and the Institute of Biomolecular Chemistry of C.N.R. of Sassari (Italy), all cases of malignant breast tumors registered in the Province of Sassari in the period 1992-2002 were studied in order to evaluate:

- Percentage of incidence of malignant breast tumors in comparison to female genital tumors such as corpus uteri, cervical and ovarian forms and to other female tumors
- Frequency and incidence per 100,000 women and per year
- Incidence per 100,000 per age-class distribution
- Distribution of cases according to histotype and per age-class distribution
- Distribution of cases according to TNM stage and per age-class distribution.

The data obtained have been compared with the results of our previous study [3] which involved the same population in the period 1974-1985.

Results

Incidence in comparison to gynecological tumors and to other female tumors (1992-2002)

The percentage distribution of cases of malignant breast tumors in the Province of Sassari showed 29.3% for breast tumors versus 13.2% for gynecological tumors and 57.5% for other tumors.

Frequency and incidence per 100,000 women per year

Table 1 shows the distribution of malignant breast tumors with regard to the year of first observation per 100,000 women. In the period 1974-1985 (overall 1,139 cases) the mean incidence of malignant breast tumors was 43.4/100,000 with values ranging from 29.09 (1974) to 59.9 (1983). In the period 1992-2002 (overall 2,735 cases), the mean incidence resulted to be 106.0/100,000, with values ranging from 79.0 (1992) to 132.0 (2001).

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Table 1. — *Distribution of malignant breast tumors in relation to the year of first observation (number of cases and rate/100,000 women).*

Year	No. of cases	Rate/100,000
1974	64	29.09
1975	81	36.8
1976	77	34.9
1977	73	37.7
1978	80	36.3
1979	93	42.2
1980	104	47.2
1981	101	45.9
1982	112	50.9
1983	132	59.9
1984	101	45.9
1985	121	54.9
Total	1,139	43.4

Year	No. of cases	Rate/100,000
1992	183	79.0
1993	207	87.0
1994	226	95.0
1995	241	106.0
1996	233	100.0
1997	240	101.0
1998	245	103.0
1999	257	108.0
2000	306	128.0
2001	309	132.0
2002	288	129.0
Total	2,735	106.0

Incidence per 100,000 women per year

Table 2 shows the incidence per 100,000 women selected by age group comparing the data of the period 1974-1985 with that of 1992-2002. Malignant breast tumors in the first period (1974-1985) had a peak incidence (191.1/100,000) between 55 and 59 years whereas in the second period (1992-2002) the peak (302.0/100,000) was registered in the advanced age group (75-79 years). If we consider the age groups, the class at

Table 2. — *Incidence of malignant breast tumors (rate/100,000 women) for age-class distribution (1974-1985 vs 1992-2002).*

Year	1974-1985 /100,000	1992-2002 /100,000
20-24	—	1.0
25-29	6.5	6.0
30-34	59.5	27.0
35-39	43.5	58.0
40-44	116.9	125.0
45-49	170.2	171.0
50-54	140.6	178.0
55-59	191.1	236.0
60-64	72.4	210.0
65-69	151.1	270.0
70-74	125.0	291.0
75-79	—	302.0
80-84	—	260.0
≥ 85	—	227.0
Mean/100,000	43.4	106.0

highest risk for malignant breast tumors was between 45 and 65 years and we reported an incidence of 146.6/100,000 women in the period 1974-1985 versus 198.7/100,000 in the period 1992-2002.

Histotype

With regard to histotype, we had 934 out of 1,139 (82%) cases of ductal carcinoma versus 1,783 out of 2,735 (65.2%) cases, 102 out of 1,139 (9%) cases of lobular carcinoma versus 319 out of 2,735 cases (11.7%) in the period 1974-1985 and in the period 1992-2002, respectively (Table 3). No change was observed with regard to unclassifiable tumors (3.8% vs 4.6%), papilliferous (0.9% vs 0.3%) or Paget tumors (1.18% vs 1.5%) between the two considered periods.

The correlation between histotype and age-classes showed an elevated incidence of anaplastic or unclassifiable forms in women ≥ 90 years (60.7%) and a higher incidence of medullary forms in the earlier age classes (6.3%, 30-39 years) in comparison to the previous decade. On the other hand, there was no difference in the distribution of other histotypes between the two periods.

TNM stage

With regard to TNM stage, in the period 1992-2002, 50.5% of patients were T1, 34.9% T2 and 10.0% T4. Whereas in the period 1974-1985 we had only the data of T0 which represented 3.4% versus 0.1% in the last period (Table 4).

Correlation between tumor size and age distribution (1992-2002)

With regard to the correlation between tumor size and age distribution, the highest incidence of cases of T1 was in the age class 50-59 years (352 out of 1,383, 25.4%). If stage of disease was considered in the different age classes, the occurrence of advanced stage in the oldest age classes (50 out of 212, 23.6% had T4 between 80 and 89 years; 16 out of 28, 57.1% had T4 in class ≥ 90 years), whereas the youngest age classes had T1 in 11 out of 15 cases (73.3%) between 20 and 29 years, 99 out of 173 of cases (57.2%) between 30 and 39 years and 295 out of 526 (56.1%) between 40 and 49 years, respectively (Table 5).

Correlation between pathological node status and age distribution (1992-2002)

Among 1,964 valuable cases (pN0, pN1, pN2, pN3), a positive pathological node status was seen in 916 (46.6%) cases (pN1, pN2, pN3) with a high prevalence of pN1 (892 out of 916, 97.4%). As for the relationship between node involvement and age of the patients, the highest incidence of node metastasis was in the youngest age classes (6 out of 15, 40% between 20 and 29 years; 60 out of 173, 34.7% between 30 and 39 years; 256 out of 626, 40.9% between 50 and 59 years). In the most advanced age classes, the incidence of node metastasis progressively reduced (155 out of 534, 29.0% in 70-79 years; 23 out of 212, 10.8% in 80-89 years; 1 out of 28, 3.6% in women ≥ 90 years) (Table 6).

Table 3. — Correlation between histotype and age distribution (1992-2002).

Histotype			AGE CLASSES							
	No.	%	20-29	30-39	40-49	50-59	60-69	70-79	80-89	≥ 90
Unclassifiable	126	4.6	1	4	15	18	19	30	22	17
Ductal	1783	65.2	10	117	339	409	416	352	132	8
Lobular	319	11.7	1	11	65	69	84	67	20	2
Ductal + Lobular	253	9.2	3	19	51	76	50	42	12	—
Scirrhus	2	0.07	—	—	—	1	—	—	1	—
Medullary	44	1.6	—	11	11	9	8	4	1	—
Papilliferous	10	0.3	—	—	1	1	3	3	2	—
Paget	43	1.5	—	3	12	9	10	3	5	1
Sarcoma	7	0.2	—	2	—	2	2	1	—	—
Filloid	11	0.4	—	—	4	5	1	1	—	—
Neuroendocrine	5	0.1	—	—	—	1	1	2	1	—
Comedocarcinoma	34	1.2	—	4	8	11	4	5	2	—
Inflammatory	3	0.1	—	—	—	2	1	—	—	—
Adenosquamous	14	0.5	—	—	3	4	5	1	1	—
Tubular	18	0.6	—	2	6	3	4	2	1	—
Solid	19	0.6	—	—	6	1	6	3	3	—
Mucinous	44	1.6	—	—	5	5	7	18	9	—
Total	2735	100	15	173	526	626	621	534	212	28

Table 4. — TNM stage distribution of cases.

TNM Stage	(1992/2002)	
	No.	%
T0	4	0.1
T1	1383	50.5
T2	955	34.9
T3	119	4.3
T4	274	10.0
Total	2735	100

Correlation between tumor metastases and age distribution (1992-2002)

Among 2,427 evaluable cases (M0, M1), incidence of tumor metastases was found in 291 cases (12.0%). The correlation between tumor metastases and age distribution showed a trend similar to that of breast tumor size, with the highest incidence in the oldest age classes (9 out of 28 cases, 32.1% in women ≥ 90 years). On the other hand, the incidence of tumor metastases was lowest in the youngest age classes (62 out of 714 cases, 8.7% between 20 and 49 years).

Table 5. — Correlation between tumor size and age distribution (1992-2002).

Tumor size	Age classes								
	No.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	≥ 90
T0	4	—	—	—	1	2	1	—	—
T1	1383	11	99	295	352	323	230	71	2
T2	955	4	55	189	210	202	217	70	8
T3	119	—	8	14	24	28	22	21	2
T4	274	—	11	28	39	66	64	50	16
Total	2735	15	173	526	626	621	534	212	28

Table 6. — Correlation between pathological lymph nodal status and age distribution (1992-2002).

Tumor size	Age classes								
	No.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	≥ 90
pN0	1048	6	76	232	1	279	175	22	—
pN1	892	6	59	185	352	223	150	20	1
pN2	21	—	1	3	210	3	5	2	—
pN3	3	—	—	—	24	1	—	1	—
pNx	771	3	37	106	39	115	204	167	27
Total	2735	15	173	526	626	621	534	212	28

Table 7. — Correlation between tumor metastases and age distribution (1992-2002).

Metastases	Age classes								
	No.	20-29	30-39	40-49	50-59	60-69	70-79	80-89	≥ 90
M0	2136	12	151	458	535	519	384	72	5
M1	291	2	17	43	55	66	64	35	9
Mx	308	1	5	25	36	36	86	105	14
Total	2735	15	173	526	626	621	534	212	28

Discussion and conclusions

Analysis of our data for the period 1992-2002, if compared with the previous period 1974-1985 [3], did not show a significant difference in the percentage distribution of malignant breast tumors in relationship to the other female tumors (29.3% vs 30.7%, respectively). These data are due to the global increase of all female tumors. In fact, the overall number of malignant breast tumors more than doubled from 1,139 cases in the period 1974-1985 to the 2,735 cases in the period 1992-2002, and the mean rate/100,000 changed from 43.4 to 106.0.

The constant increase of malignant breast tumors in the advanced age-groups and in advanced stage of disease may be explained by the increase in the female population higher than 65 years of age that per se constitutes a class of age at enhanced risk of cancer. Furthermore, this increase could be related to the absence of screening programs in the past. The incidence in the age classes 45-64 years, which are at enhanced risk for breast cancer, was globally increased, changing from 143.6/100,000 to 198.7/100,000. On the other hand, the incidence in one of the youngest age classes (30-34 yrs) was reduced from 59.5% to 27.0% in the previous period 1974-1985 [3] and in the 1992-2002 period, respectively.

Analysis of the histotypes showed a relative reduction of ductal carcinoma in the period 1992-2002 in comparison to the previous period 1974-1985 [3] (65.2% vs 82.0%) whereas the incidence of anaplastic forms increased in advanced ages of life. The latter data could be explained with the hypothesis of a lack of endocrine control during this time of life with the occurrence of non-hormonal tumors which are less differentiated and have a poor prognosis (lack of estrogen-receptors, low response to endocrine therapies, and frequent nodal involvement even with small size primitive tumors).

We reported an important reduction of T0 tumors from 3.4% to 0.1%. These data could be due to the low diffusion of screening programs in Sardinia. However, about half of the patients were diagnosed in stage T1 in the middle age classes (50-59 yrs) whereas the advanced stage cases (T2, T3, T4) were more frequent in the last decades of life where routine control was lacking in absence of symptomatology.

About 50% of patients whose nodal status was evaluable by histology had positive nodes. These data, especially in the youngest patients, showed a high grade of breast tumor malignancy.

Tumor metastases were more frequent in the advanced age groups.

In conclusion, our data show a progressive and worrying increase of malignant breast tumors in the Province of Sassari (Sardinia Island, Italy) which more than doubled in incidence in comparison to the data of 1974-1985 [3]

The analysis of these data together with those of endometrial carcinoma [4] and ovarian carcinoma [5] which are progressively and constantly increasing, show that, in the Province of Sassari, the risk (probably genetically related) to have a female hormone-dependent tumor is very high.

The molecular biology studies we are performing to discover the presence of genetic mutations and chromosomal markers in patients with these female cancers will help clear up some doubts. However, the worrying data of the strong reduction of T0 cases, the increased age of first diagnosis and of the advanced forms with positive nodal metastases show that the prevention program is not yet well organized.

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