Type of Breast Cancer Diagnosis, Screening, and Survival

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Abstract

Organized, invitational breast cancer screening in our population succeeded in detecting early-stage tumors, which have been consequently treated more frequently with breast and axillary conservative surgery, complementary breast irradiation, and eventual hormonal therapy. The diagnosis of invasive cancer with screening in our population resulted in a survival gain at 5 years from the diagnosis.

Introduction: Breast cancer screening is known to reduce mortality. In the present study, we analyzed the prevalence of breast cancers detected through screening, before and after introduction of an organized screening, and we evaluated the overall survival of these patients in comparison with women with an extrascreening imaging-detected breast cancer or those with palpable breast cancers. **Materials and Methods:** We collected data about all women who underwent a breast operation for cancer in our department between 2001 and 2008, focusing on type of tumor diagnosis, tumor characteristics, therapies administered, and patient outcome in terms of overall survival, and recurrences. Data was analyzed by R (version 2.15.2), and $P < .05$ was considered significant. **Results:** Among the 2070 cases of invasive breast cancer we considered, 157 were detected by regional mammographic screening (group A), 843 by extrascreening breast imaging (group B: 507 by mammography and 336 by ultrasound), and 1070 by extrascreening breast objective examination (group C). The 5-year overall survival in groups A, B, and C were, respectively, 99% (95% CI, 98%-100%), 98% (95% CI, 97%-99%), and 91% (95% CI, 90%-93%), with a significant difference between the first 2 groups and the third ($P < .05$) and a trend between groups A and B ($P = .081$). **Conclusion:** The diagnosis of invasive breast cancer with screening in our population resulted in a survival gain at 5 years from the diagnosis, but a longer follow-up is necessary to confirm this data.

Clinical Breast Cancer, Vol. 14, No. 4, 235-40

Keywords: Breast cancer, Breast cancer screening, Invasive breast cancer, Mammographic screening, Overall survival

Introduction

Because of the detection of early-stage tumors, breast cancer screening reduced breast cancer mortality in Europe by 25%-31% in patients who were invited for screening and by 38%-48% in those who were actually screened during the last decade of the twentieth century and the first decade of the twenty-first.[1] In our region of Italy, an organized breast cancer screening was firstly introduced in 2005, but despite the high compliance of invited women (which progressively increased after the screening introduction), a high prevalence still exists of women who have their breast cancer diagnosed by extrascreening objective examination or imaging.[2,3]

In the present study, analyzed, among breast cancer patients treated in our department, the prevalence of breast cancers detected through the invitational screening, and the overall survival of these patients in comparison with that of women with an extrascreening imaging-detected breast cancer or those with palpable breast cancers.

Materials and Methods

We collected retrospective data for about 2811 women who underwent a breast operation following breast cancer diagnosis or suspicion in our clinic between January 2001 and April 2008, in order to have a follow-up of ≥ 5 years for every patient. Then, we excluded women with a diagnosis of benign lesion (471 patients), intralobular neoplasia (22 patients), or intraductal neoplasia (248 patients). Intraductal neoplasia represented the 17.6% of screen-detected and the 14.4% of extrascreening imaging-detected breast

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Submitted: Feb 17, 2013; Revised: Jan 23, 2014; Accepted: Feb 12, 2014; Epub: Feb 20, 2014

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1526-8209/$ - see frontmatter
http://dx.doi.org/10.1016/j.clbc.2014.02.004

Table 1 Description of the Population in the Different Groups

Characteristic	Method of Cancer Detection			*P*
	Screening	Imaging	Palpable Lesion	
Age, years (SD)	61.6 (±5.77)	60.01 (±11.25)	61.2 (±15.14)	.104
BMI, kg/m^2 (SD)	27.47 (±5.55)	25.84 (±4.76)	25.49 (±4.8)	<.05
	Patients, % (no./total)	Patients, % (no./total)	Patients, % (no./total)	
Tobacco smoker[a]	7.9 (12/151)	4.7 (32/685)	5.7 (49/858)	.256
Familial history of breast cancer[a]	28.6 (10/35)	28.7 (48/167)	36.3 (89/245)	.234
Estroprogestinic therapy[a]	20.0 (7/35)	28.1 (43/153)	25.1 (54/215)	.579
Menopause[a]	97.9 (137/140)	83.8 (607/724)	75.7 (738/975)	<.05
Surgical treatment (first procedure)				
Conservative	84.1 (132/157)	75.6 (637/843)	47.4 (507/1070)	<.05
Mastectomy	15.9 (25/157)	24.4 (206/843)	52.6 (563/1070)	<.05
Axilla surgery				
CALND	33.8 (53/157)	49.5 (417/843)	80.0 (856/1070)	<.05
SLNB	65.6 (103/157)	47.1 (397/843)	15.0 (160/1070)	<.05
None	0.6 (1/157)	3.4 (29/843)	5.0 (54/1070)	<.05
Surgical treatment (second procedure)[b]				
Nothing	76.5 (101/132)	68.9 (439/637)	72.0 (365/507)	.172
Conservative	15.2 (20/132)	14.8 (94/637)	10.1 (51/507)	<.05
Mastectomy	8.3 (11/132)	16.3 (104/637)	17.9 (91/507)	<.05
Neoadjuvant therapy	5.7 (9/157)	0.5 (4/843)	16.0 (171/1070)	<.05
Adjuvant therapy[a]				
Radiotherapy	76.3 (119/156)	63.6 (510/802)	48.9 (496/1015)	<.05
Chemotherapy	26.3 (41/156)	36.3 (290/799)	51.1 (518/1013)	<.05
Hormonal therapy	85.3 (133/156)	83.3 (663/796)	73.2 (742/1013)	<.05

Abbreviations: BMI = body mass index; CALND = complete axillary lymph node dissection; SLNB = sentinel lymph node biopsy.
[a]Sample size varies because of incomplete data.
[b]Sample size varies because only conservative treatment were eventually treated by a second procedure.

lesions, while it accounted for only the 2.5% of palpable lesions; therefore, we decided to exclude it from data analysis because of its better prognosis and its consequently probable influence on the survival analysis. In fact, it is well-known that the screening benefit of mortality reduction is accompanied by the harm of overdiagnosis, defined as the detection at screening of a cancer that would not have otherwise become clinically evident in the woman's lifetime.[4,5] Finally, the study population included 2070 women affected by invasive breast cancer.

Collected data included the following patients characteristics: age at diagnosis, body mass index (BMI), familial history of breast cancer, fertility status, eventual use of estroprogestinic therapies. Tumor characteristics were considered as follows: histological type, TNM classification and stage, nuclear grading, Mib1/Ki-67 proliferation index, hormone receptors status including estrogen receptor (ER), progesteron receptor (PR) and Her2/neu expression, eventual involvement of extraaxillary lymph nodes (internal mammary chain or subclavear ones), and other microscopic features evaluated in the new classification by Veronesi et al.[6] such as multifocality, extensive intraductal component, perivascular invasion, peritumoral inflammation, lymph node extracapsular invasion or blanched lymph nodes. Moreover, the therapeutic management was investigated, including conservative versus radical, breast and axillary surgery, eventual neoadjuvant therapies, adjuvant breast irradiation, endocrine or chemotherapy administered.

Then, the study population was divided into 3 groups as follows: group A) screen-detected breast cancers (including lesions detected by mammography, ultrasound or breast objective examination within the biyearly, organized, regional screening program); group B) extrascreening imaging-detected breast cancers (including lesions detected by mammography or ultrasound, which the women underwent spontaneously, for example in case of familial history of breast cancer out from the age range of the screening, or yearly within the interval between 2 screening invitations, or even simply for personal choice); group C) cancers detected by extrascreening breast objective examination (including palpable mass, cutis retraction, breast ulceration, nipple discharge, and mastitis carcinomatosa).

Data was analyzed by R (version 2.15.2), considering significant $P < .05$. Monovariate analysis was performed by 1-way Anova or t test in case of continuous variables, chi-square test or Fisher exact test in case of categorical variables. Some data are presented as proportions with relative 95% confidence interval where appropriate. Overall survival was considered to be the main outcome, and Kaplan-Meyer curve was drown to compare the overall survival among the 3 groups. Moreover, also the incidence of locoregional and distant recurrences was compared among the 3 groups.