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ScienceDirect
EJSO
the Journal of Cancer Surgery
ELSEVIER
EJSO 33 (2007) 424–429
www.ejso.com

Variations in treatment of ductal carcinoma in situ of the breast: A population-based study in the East Netherlands

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Accepted 21 September 2006
Available online 2 November 2006

Abstract

Aims: Differences in treatment of ductal carcinoma in situ (DCIS) of the breast were analysed for a geographically defined population in the East Netherlands.
Methods: Data from the Cancer Registry of the Comprehensive Cancer Centre East Netherlands were analysed for treatment of DCIS in the period between January 1989 and December 2003. The study population consisted of 800 female patients with a first diagnosis of DCIS of whom 798 underwent surgical treatment. The distribution of tumour characteristics and treatment were compared for several time periods.
Results: Surgical treatment was specified for 648 patients: 51% underwent breast-conserving surgery. The proportion of patients treated with breast-conserving surgery increased: 43% in the period 1994–1998 and 55 after 1999 ($p < 0.01$). An axillary staging procedure was performed in 149 patients (19%), of whom 2 (1%) had tumour-involved lymph nodes. Of patients treated with breast-conserving surgery, 133 (40%) received radiation therapy: 7% in the period 1994–1998 compared to 62% after 1999 ($p < 0.01$). Patients (60%) of 50 years or younger were treated with mastectomy compared to 44% in patients aged 50–69 years and 50% in patients of 70 years and older ($p < 0.01$). The rate in use of radiation therapy after breast-conserving surgery was comparable to both age groups.
Conclusion: This study shows variability in the treatment of DCIS in a geographically defined region. Approximately half of all patients were treated with mastectomy and 19% underwent an axillary staging procedure; this may represent aggressive, unwarranted treatment. In contrast, 38% of patients treated with breast-conserving surgery were not treated with radiation therapy after 1999, which may represent under-treatment.
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Keywords: DCIS; Intraductal carcinoma; Treatment

Introduction

Ductal carcinoma in situ (DCIS) of the breast constitutes malignant cells within the mammary duct system with no invasion beyond the basement membrane.[1] It usually presents as a mammographic abnormality and is subclinical in the majority of patients.[2] Due to the widespread use of mammographic screening programs, the incidence of DCIS has increased dramatically in last decade.[3,4] In The Netherlands, the breast cancer screening program for women aged 50–69 years was gradually introduced in the period between 1987 and 1996, and extended to women aged 70–74 years in 1998. Similar to other countries, the incidence of DCIS has increased since then.[5]

The natural history of DCIS is not clear, but it is considered to be a precursor lesion for invasive breast cancer.[6,7] However, the risk of dying due to breast cancer in patients diagnosed with DCIS is low (2% after 10 years follow-up).[8] Breast-conserving therapy has proven to be a safe alternative treatment option compared to mastectomy for patients with invasive breast cancer.[9] Therefore, breast-conserving surgery for DCIS is also assumed to be effective and used widely.[3,10,11] With breast-conserving treatment of DCIS, local recurrences are of major concern, because half of these recurrent tumours are invasive carcinomas with the risk of distant disease and subsequent death.[12–14]

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0748-7983/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ejso.2006.09.018

Therefore, preventing local recurrences is the main issue in treating patients with DCIS. Recently, 3 large-scale randomised studies have revealed a beneficial effect of postoperative radiation therapy after breast-conserving surgery in the treatment of DCIS in preventing local recurrences.[15–19] Therefore, breast-conserving surgery followed by radiation therapy is recommended for treatment of DCIS.[10] Despite these treatment recommendations, variable strategies in treatment of DCIS have been described previously with different proportions of patients treated with a mastectomy and variations in use of radiation therapy after breast-conserving surgery.[3,11,20–24]

Besides cancer registry, the comprehensive cancer centres provide guidelines for treatment of cancer. These guidelines are evidence-based and developed by multidisciplinary working groups. Implementation is supported by regional tumour study groups which take part in oncology committees in regional hospitals. The guideline for treatment of DCIS within the East Netherlands recommends a microscopically complete excision by either breast-conserving surgery or mastectomy. This guideline was updated in 1999, and radiation therapy was recommended after breast-conserving surgery. Furthermore, for DCIS lesions measuring 5 cm or more an axillary staging procedure by either a sentinel lymph node biopsy or axillary lymph node dissection was advised.

The aim of this study was to analyse population-based data from the Cancer Registry of the Comprehensive Cancer Centre East to gain further insight into the treatment of DCIS in the period between January 1989 and December 2003.

Patients and methods

The Cancer Registry of the Comprehensive Cancer Centre East is complete since 1989. The cancer registry collects data on cancer from a geographically defined population. The main source of notification is a national archive of pathology reports from PALGA, the nationwide network and registry of histo- and cytopathology in The Netherlands. This is completed with data from the National Discharge Registry. After notification, data from these patients are extracted from medical files by trained registration clerks. Data collection is subjected to a national quality control system. The Cancer Registry collects patients' variables, data on treatment, histopathological variables of tumours, stage at diagnosis, and scarce follow-up data (date of last contact, occurrence of secondary cancers). Items noted are age at diagnosis, type of surgery, re-operations, and the use of adjuvant therapy, grade of differentiation, and classification according to the TNM system.

Presently, the Comprehensive Cancer Centre East (Integraal Kankercentrum Oost, IKO) is constituted of 8 hospitals: 7 regional hospitals and 1 university hospital (institutes listed at the end of this report). In these 8 hospitals all patients who are diagnosed with cancer and living in the eastern part of The Netherlands are treated. Data collection from 1 hospital (Hospital Bernhoven, Oss, 42 patients in the presented population) was transferred to another regional Cancer Registry in 2000.

Patients are treated with radiation therapy in 2 institutes: the Radboud University Nijmegen Medical Centre and the Arnhem Radiation Therapy Institute.

Guidelines for treatment of DCIS in this region recommend a complete surgical excision with either a mastectomy or breast-conserving surgery when appropriate. This guideline was updated in 1999 and the standard use of radiation therapy after breast-conserving surgery was advised.

Within the database of the Cancer Registry all breast tumours classified as 'in situ' in the period between January 1989 and December 2003 were identified. Patients with a history of or a simultaneous invasive breast cancer and other malignancies (except for non-melanoma skin cancer and in situ cervical carcinoma) were excluded. Patients with incomplete data within the registry were also excluded. Eight hundred female patients with a first diagnosis of DCIS were selected.

The data were analysed with SPSS version 11.5 (SPSS, Chicago, IL, USA). The distribution of variables in different time periods was tested with Chi-square test. For continuous variables Student's t test was used.

Results

During the study period, the number of DCIS increased by 88%: 189 tumours were diagnosed in the period 1989–1993, 256 between 1994 and 1998 whereas 355 tumours were diagnosed in the period 1999–2003.

Table 1 lists patient, treatment, and tumour characteristics of the study population. Median age at diagnosis was 58 years (mean 58 years, range 23–91 years) and did not significantly change over calendar periods (data not shown).

Before 1992, histopathological grading was available for 12 out of 189 patients (6%) only, whereas after 1999 grading was noted for 319 out of 355 patients (90%). Overall, histopathological grading was available for 450 tumours (56%): 209 lesions (46%) were classified as non-high grade (well and moderately differentiated) and 241 (54%) as high grade (poorly differentiated) DCIS lesions.

All but 2 patients underwent surgical treatment. In 150 patients (19%), of whom the majority had been registered before 1993, the exact type of definitive surgery was not known.

Initially, 495 patients (77%) underwent breast-conserving surgery and 151 patients (23%) mastectomy whereas type of initial surgery was unknown in 152 patients. After performance of 1 or more surgical procedures, definitive surgical treatment constituted of breast-conserving surgery in 329 patients (51%) and mastectomy in 318 (49%). For unknown reasons, 1 patient was treated with a sentinel lymph node biopsy only.

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