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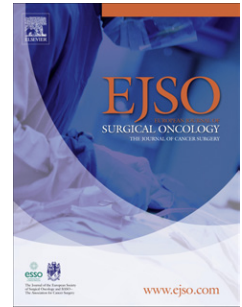


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Enhancing the quality of care for patients with breast cancer: seven years of experience with a Dutch auditing system

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Abstract*Background*

Hospitals in the Midwestern part of the Netherlands carried out a clinical audit to monitor the quality of breast cancer care during the years 2002-2008. Compliance with the National Guideline was investigated together with improvement in quality over time.

Methods

Patients with a malignancy of the breast (including ductal carcinoma in situ) participated in this study. Nine quality indicators were evaluated over the years. In 2004 and 2005 the hospitals also carried out an intervention project aimed at improvement of the efficiency of both the diagnostic process and the surgical treatment.

Results

At the end of the project all nine indicators showed significant improvement compared to the start of the project. Discussion of treatment strategy in a multidisciplinary breast cancer team took place more often before surgery (83% versus 56%) as well as after surgery (98% versus 70%). The National Guideline for maximum waiting times was met more often for the outpatient clinic (74% versus 61%), time to diagnosis (92% versus 82%), and surgical treatment (52% versus 34%). More sentinel node procedures were performed successfully (92% versus 69%), and for more patients more than 10 lymph nodes were evaluated in case of axillary lymph node dissection (85% versus 58%). More patients had definitive surgical treatment consisting of one surgical intervention (87% versus 75%), and left the hospital within 7 days after hospital admission (98% versus 66%).

Conclusion

The clinical audit contributed to improvement of the quality of breast cancer care in the Midwestern part of the Netherlands between 2002 and 2008.

Key words: breast cancer, audit, indicators, guidelines, registration project, intervention project

Introduction

In the Netherlands, between 1990 and 2002, the number of women with the diagnosis breast cancer increased annually by more than one percent.[1] In 1990, 77 out of 100 000 women were diagnosed with breast cancer, whereas twelve years later the incidence had increased to 91 out of 100 000 women.[2] Therefore, hospitals in the Netherlands needed to adjust to increasing volumes of breast cancer patients. During the nineties, breast cancer care started to become a greater burden on tight health care budgets.[3] As a result, insurance companies demanded that hospitals should work more efficiently and at the same time maintain high level quality care.[4]

In 1999 the National Breast Cancer Council in The Netherlands (NABON) defined various quality indicators for the diagnostic process and the primary treatment of breast cancer.[5] These NABON quality indicators were revised in 2008.[6]

In 2001, the professional network of surgical oncologists affiliated with the Comprehensive Cancer Centre West (CCCW) situated in the Midwestern part of the Netherlands wanted to gain insight into the quality of the diagnostic process and the surgical treatment of their breast cancer patients. They started a regional registration project. This information was fed back to the multidisciplinary breast cancer team (MBT) as a clinical audit. The registration project lasted until 2008. During part of the registration period, in 2004, 2005 and 2006, the Dutch Association of Comprehensive Cancer Centres (ACCC) together with the Dutch Institute for Healthcare Improvement (CBO) coordinated a national intervention project that aimed at improvement of the diagnostic process and surgical treatment.

We investigated the extent to which the clinical audit or registration project and the intervention project contributed to the improvement of this care. We measured the level of compliance with the National Guideline using nine quality indicators.

Methods

Patients

Between January 2002 and December 2008, data were collected on patients diagnosed with a malignancy of the breast (including ductal carcinoma in situ (DCIS)) in one of nine hospitals in the CCCW region. Male patients and patients with lobular carcinoma in situ were not included.

Registration

From 2002 until 2006, the MBT entered aspects of the diagnostic process and the primary surgical treatment of each patient in a local database. In 2006, independent data clerks from the CCCW took over the registration, and data were collected in the database of the Netherlands Cancer Registry (NCR). Patient characteristics, such as date of birth, date of diagnosis and tumour characteristics, were registered. Tumour characteristics, such as tumour type, sub site (International Classification of Diseases for Oncology (ICD-O-3), histology, stage (Tumour Lymph Node-Metastasis (TNM) clinical classification), grade, and treatment, were obtained routinely from the medical records and registered in the NCR. The NCR is based, among others, on notification of all newly diagnosed malignancies in hospitals by the national automated pathological archive (PALGA). The quality of the information is guaranteed through thorough training of the data clerks and computerized consistency checks at regional and national levels.[7]

Quality indicators

A quality indicator gives the percentage patients treated according to the National Guideline. This percentage gives an indication of the quality of care. For each quality indicator, NABON defined so-called norm scores. A norm score is the minimum percentage patients who should be treated according to the National Guideline. Table 1 shows the indicators that were measured.

Benchmark

The intervention project was set up according to the method of Don Berwick.[7] This method includes the Plan-Do-Study-Act cycle of Deming to initiate continuous quality improvement. This method is designed to enable care improvement within a short period of time.[8] Each year from 2002 until 2006, hospitals received a written report with regional benchmark information on each indicator. Furthermore, in 2004, 2005, and 2006, the care professionals attended training sessions twice a year. During these training sessions, an anonymous

benchmark was presented in which the indicator scores for each hospital were compared with the regional mean score and the norm score. The care professionals generally discussed those indicator scores that clearly deviated from the regional mean score or the norm score with experts in the field. The care professionals were stimulated to improve these aspects. Finally, in 2006, 2007 and 2008, a member of the MBT presented the benchmark information to the Oncology Committee within each hospital. This presentation for direct colleagues stimulated the care professionals to discuss the results more freely and to initiate improvement initiatives.

Analysis

Regional mean scores of various quality indicators were calculated and compared across three different time periods: 2002-2003, 2004-2005, and 2006-2008. For each quality indicator, the difference between the regional mean scores was tested for significance with the Chi-squared test for trend (Linear-by-Linear Association). In order to identify the extent to which clinical practice was in compliance with the National Guideline, the regional mean score was compared with the norm score for each indicator as defined in 2008.

Results

Increased registration

Yearly a total of approximately 1 400 patients was diagnosed with a malignancy of the breast within the CCCW region. The inclusion of patients in the database increased over the years (Figure 1). In 2002 and 2003, data was collected on in total 880 patients. During this period, only four out of nine hospitals in the region registered data on their patients. In 2004 and 2005, data was collected on in total 1 614 patients. During this period all nine hospitals registered their patient data. Between 2006 and 2008, data was collected on in total 4 364 patients. During this period the CCCW registered data on all patients.

Local initiatives for care improvement

Several local initiatives for care improvement have been introduced. In order to decrease the waiting times, the opening hours of the outpatient clinics have been extended, and better logistics have been applied to appointments for various disciplines, for example through time slots. Furthermore, for the SN procedure several techniques were used: pre-operative lymphoscintigraphy, perioperative radiocolloid combined with blue dye injection, and occasionally SPECT imaging. The higher success rate of the SN procedure was, however, probably the result of better cooperation within the multidisciplinary teams, leading to better team performance. Besides, the performance may have been refined (with for example massage of the injection site, and a raised arm position during lymphoscintigraphy). Finally, discussion of treatment strategies in a MBT before surgery, and an appointment with the breast cancer-nurse before surgery have become standard procedure.

Quality improvement

In 2002, none of the nine quality indicators met the norm score. In 2004, the norm score was met for two quality indicators: the proportion of patients discussed in the MBT after surgery, and the proportion of patients with only one primary surgical intervention (either breast-conserving surgery or mastectomy). In 2008, four of the nine quality indicators met the norm score: the proportion of patients discussed in the MBT after surgery, the proportion of patients who first visited the outpatient clinic at the latest on day seven after contact, the proportion of patients discharged at the latest on day seven after hospital admission, and the proportion of patients with only one primary surgical intervention. All nine indicators exhibited significant improvements ($p < 0.01$) over time (Figure 2).

Discussion

All nine quality indicators have improved significantly. In 2008, four of the nine quality indicators met the norm score, whereas in 2002, none of the quality indicators met the norm score. A former publication on breast cancer benchmark information from this region showed comparable results. Blauwgeers et al. measured fourteen quality indicators over the period 2002-2004. In 2004, six of fourteen quality indicators met the benchmark: the proportion of patients who received the histological diagnosis at the latest on day seven after the first visit to the outpatient clinic; the proportion of patients who underwent surgery at the latest on day 21 after the patient received the histological diagnosis; and the proportion of patients with only one primary surgical intervention (either breast-conserving surgery or mastectomy), among others.[9] That study showed that most quality indicators had improved in 2004, compared to 2002, as was the case for this registration project. Furthermore, a national publication on the intervention project showed that in 2006 the waiting times had decreased, more patients had been discussed with the MBT before surgery, and the burden of surgical treatment had decreased compared to 2005. [10]

Awareness

Various factors may have contributed to the improved indicator scores in the current study. The benchmark information that was presented during the training sessions, and during the meetings of the Oncology Committee within each hospital, probably made the care professionals eager to perform better than the year before and better than other hospitals. MBT's had started local initiatives for care improvement and were monitoring the effectiveness of these initiatives.

The registration project demanded careful registration of the care provided and offered insight into various quality indicators. In cooperation with the CCCW, hospitals have significantly improved documentation for the hospital information systems, which facilitated better evaluation of breast cancer care.[11] It is likely that both the registration process and the benchmark information increased awareness of the MBT's of the quality of breast cancer care.

Remarks

For various reasons, careful interpretation of comparisons between the three study periods is warranted. First, the changes in care need to be interpreted as the possible effect of both the intervention project and the registration project, because, between 2004 and 2006, the intervention project was carried out at the same time as the registration project. It is impossible to identify the possible effects of each project separately.

Secondly, at the beginning of the project data were missing, because hospitals collected data at random and sometimes only during certain periods in time. Therefore the results for this period may not be fully representative, although there is no reason to assume that hospitals registered patient data selectively. Blauwgeers et al. noted that despite changes in the number of patients included, the performance for each hospital remained almost the same in this period.[9] Furthermore, the total number of patients within each period is large enough to rule out the possible effects of differences in patient characteristics.

Thirdly, in the 2006-2008 period independent data clerks took over data registration from the care professionals. This introduced the risk of bias, since independent data clerks do not have the background information the caregivers have about the care provided. It is hard to say how this possible bias may have affected the differences in care before and after 2006.

Fourthly, the caregivers knew about the aim of the registration project. It is conceivable that the improvement initiatives would have been less effective if the caregivers had been unaware that their performance was being measured. The simple fact is that people tend to perform better when they know their actions are being evaluated.[12]

Fifthly, it is likely to assume that surgeons gained experience over the years, which in itself will have led to better results over time, independent of possible improvement initiatives.

Finally, we can not rule out the possibility that changes in outcome were due to autonomous factors, not in any way related to the registration or the intervention project.

Recommendations

We recommend that hospitals keep investing in the registration and monitoring of breast cancer care, in order to detect possible changes in quality of care and to enable a continuous evaluation of improvement initiatives in their care process over time. Preferably, registration should be carried out by an independent organisation, to decrease the risk of interpretation bias. When the results are used to evaluate improvement initiatives, they are most informative when compared with historic results, regional mean scores, or norm scores.

Conclusions

According to our quality indicators, compliance with the National Guideline improved over time. However, five out of nine quality indicators have not yet met the norm score, leaving room for improvement in the level of compliance with the National Guideline. Waiting times for diagnosis and treatment have been reduced significantly. Registration and monitoring quality of care have become an integral part of breast cancer care within each hospital in the region. This registration project increased the caregivers' interest in achieving quality. Therefore we conclude that the clinical audit contributed to improvement of the quality of breast cancer care in the Midwestern part of the Netherlands during the years 2002-2008.

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Conflicts of interest statement

The submitted material has not been published and is not under consideration for publication elsewhere. We declare there are no conflicts of interest. The manuscript has been seen and approved by all authors.

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Tables and figures

Figure 1: Completeness of data collection on patients diagnosed with a malignancy of the breast (including DCIS and excluding lobular carcinoma in situ) in one of the nine hospitals in the CCCW region within each time period.

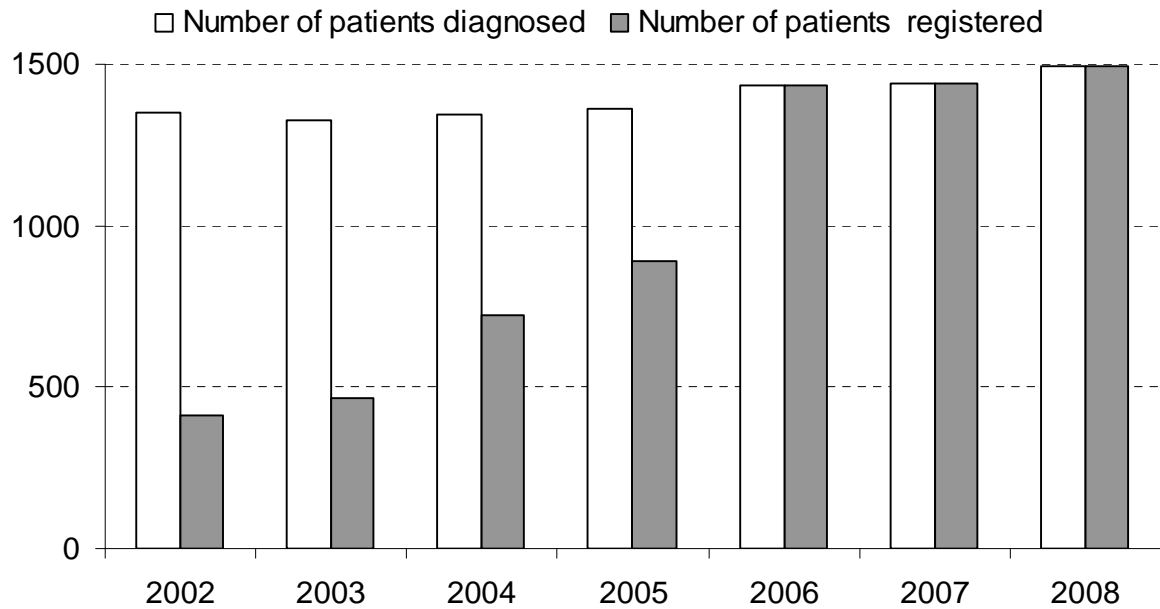


Table 1: Quality indicators for the diagnostic process and primary surgery, and the aspired norm scores.

Nr.	Indicator	Norm score 2008
1	Proportion of patients discussed in the MBT before surgery	90%
2	Proportion of patients discussed in the MBT after surgery	90%
3	Proportion of patients who first visited the outpatient clinic at the latest on day seven after contact	90%
4	Proportion of patients who received the pathology diagnosis at the latest on day seven after the first visit to the outpatient clinic	90%
5	Proportion of patients who underwent surgery at the latest on day 21 after the patient received the pathology diagnosis (exclusion: patients with previous treatment other than surgery)	90%
6	Proportion of patients discharged at the latest on day seven after hospital admission	90%
7	Proportion of successful sentinel node procedures (sentinel nodes were detected during the surgical procedure)	95%
8	Proportion of axillary lymph node dissections whereby at least 10 lymph nodes were examined	90%
9	Proportion of patients with only one primary surgical intervention (either breast-conserving surgery or mastectomy)	80%

Figure 2: Number of patients with a 'yes' as proportion of the total number of patients registered in each time period.

