



Variations in compliance to quality indicators by age for 41,871 breast cancer patients across Europe: A European Society of Breast Cancer Specialists database analysis



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Received 19 December 2014; received in revised form 26 February 2015; accepted 14 March 2015

Available online 16 April 2015

KEYWORDS

Breast cancer
Quality of care
Epidemiology
Quality indicators

Abstract Objective: The aim of this study is to assess age-specific compliance to quality indicators (QIs) regarding the treatment of breast cancer as defined by European Society of Breast Cancer Specialists (EUSOMA) for patients across Europe.

Methods: All patients entered into this study were affected by in situ or invasive breast cancer, diagnosed and treated between 2003 and 2012 at 27 Breast Units across Europe, who were entered into the EUSOMA database. Patients were categorised according to age; compliance to thirteen QIs was assessed for each age group and per time period (2003–2007 and 2008–2012). Compliance to QIs was tested by multivariable logistic regression models adjusted for breast unit, incidence year and tumour characteristics.

Results: Overall, 41,871 patients with a mean age of 59.6 years were available for analysis. The highest compliance was reached for patients aged 55–64 years and in the time period 2008–2012, whilst the lowest compliance was observed for women aged over 74 or under 40 years and in the earlier time period. In multivariable logistic regression models, a significant

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difference between age categories was shown for 12 out of 13 QIs ($P < 0.001$). Compliance to the QIs for patients aged ≥ 75 years was significantly lower when compared to patients aged 55–64 years for ten QIs, whilst for patients in the youngest age group this was true for seven QIs.

Conclusion: In conclusion, we found that among the 27 included breast units across Europe, compliance to QIs for breast cancer treatment is often lower in the youngest and oldest breast cancer patients, with a tendency to overtreatment in the youngest patients, and to *under-treatment* in the elderly.

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1. Introduction

Numerous national and international guidelines and recommendations are available to physicians treating breast cancer patients. However, a significant variation in patterns for breast cancer care has been reported throughout Europe [1,2]. This variation in treatment is accompanied by variation in breast cancer survival rates [3].

The European Society of Breast Cancer Specialists (EUSOMA) aims to improve and standardise the level of patient care throughout Europe. To accomplish this, the measurement of quality indicators (QIs) in breast cancer care is essential, in order to monitor the effectiveness and to guide improving the healthcare [4].

To identify the appropriate indicators for quality assurance in breast cancer care, EUSOMA organised a workshop in 2008 where 24 experts from different disciplines defined a set of quality indicators (QIs) on the whole process of breast cancer management based on the international literature, which was published in 2010 [4]. For each QI, the experts defined minimum and target standards [4]. Breast centres certified in compliance with the standards of the EUSOMA guidelines are required to hold a Breast Unit (BU) database for the purpose of auditing as well as for research purposes [5].

The QIs are defined without any age-specific comments, and also, the minimum standards are not age-specific. However, probably it is desired to take into account age-specific issues in treatment recommendations for breast cancer treatment.

For instance, it is questionable if deviation from standard treatment has the same impact on patient outcomes across all age groups. Population-based data from Europe and North America have shown that among older women, large differences in locoregional treatment between countries have not led to survival differences [2,6,7]. This leads to the question if ‘non-inferior’ locoregional treatment strategies result in worsened outcomes among the elderly. On the other hand, with regard to systemic therapy, a few randomised trials have shown that chemotherapy regimens which are considered inferior (but more patient-friendly, such as oral capecitabine), result in an inferior prognosis for

both younger and older patients [8,9], implying no age-specific impact on outcome.

However, when interpreting trial results, it has to be taken into account that in contrast to the growing population of the elderly with cancer, older patients are underrepresented in current clinical oncological studies [10]. Moreover, it has been shown that the older subjects who are included in a clinical trial, are not always representative for the general older population [11]. Therefore, the external validity of clinical trial results should be questioned when it concerns older patients.

With regard to younger breast cancer patients, it is opted that these patients probably deserve a different approach and management than older women, taking into account their longer general life expectancy, but also, their other, more aggressive tumour biology [12].

In summary, it is understandable to observe differences in treatment approach across age groups, accompanied by varying compliance to QIs by age. To test this hypothesis, the aim of this study is to assess age-specific compliance to the EUSOMA QIs regarding treatment for patients across Europe.

2. Methods

The EUSOMA database (db) is a central data warehouse of prospectively collected information which includes individual records on primary breast cancer cases diagnosed and treated at European breast units (BUs) providing patients’ data in a standardised format. The database was started in 2006 and collects 108 variables for each patient record, including patient and tumour characteristics, information about preoperative work-up, multidisciplinary management and follow-up data. Different BUs started entering patients in the db on different points in time, but it has been formally checked that the patients that were included in the database are consecutive patients. Records are anonymous but BUs can identify their own patients by the use of an ID code. The data transfer from each Unit database to the EUSOMA db occurs yearly through an online application and represents a requirement to obtain and to continue holding certification. BUs can access the EUSOMA db to check data quality, calculate QIs, perform data analysis and benchmarking and agree to use it

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