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Original article

Waiting time disparities in breast cancer diagnosis and treatment: A population-based study in France

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ABSTRACT

Waiting times are key indicators of a health's system performance, but are not routinely available in France. We studied waiting times for diagnosis and treatment according to patients' characteristics, tumours' characteristics and medical management options in a sample of 1494 breast cancers recorded in population-based registries. The median waiting time from the first imaging detection to the treatment initiation was 34 days. Older age, co-morbidity, smaller size of tumour, detection by organised screening, biopsy, increasing number of specimens removed, multidisciplinary consulting meetings and surgery as initial treatment were related to increased waiting times in multivariate models. Many of these factors were related to good practices guidelines. However, the strong influence of organised screening programme and the disparity of waiting times according to geographical areas were of concern. Better scheduling of diagnostic tests and treatment propositions should improve waiting times in the management of breast cancer in France.

Introduction

Breast cancer is the most commonly diagnosed and the first cause of cancer deaths in women. A rising incidence of breast cancer cases has been observed in many countries for the last decades.[1] This increase raised awareness about the possible increase in waiting time (WT) for care access. Both patients and health care providers have an influence on the WT between detection and treatment. A decrease of survival has been observed in patients whose WT was 3–6 months from the onset of symptoms to treatment.[2] Although the effect on survival of the interval time between diagnosis and treatment remains controversial,[3–5] there is considerable evidence that it causes psychological distress in women.[6–8]

In many countries, timely access to health care services has become a priority in public health policies.[9–11] The WT is an indicator not only of accessibility to health care providers but also of inequalities in patient management. Efforts to reduce WT have been emphasised in practice guidelines.[12–14] In France, one month is the recommended WT between mammography and treatment.[15] Nonetheless, the distributions of time intervals are not routinely available in France.

Population-based cancer registries provide non-biased information on the medical management of cancer and then contribute to the assessment of the health system performance, especially regarding the application of guidelines. The aim of this study was to describe WTs in breast cancer care pathways, from detection to the first therapy in a large representative sample. We also investigated

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the influence of patients' characteristics and tumours' characteristics and of the pre-therapeutic medical management.

Materials and methods

Study design and population

A population-based study on diagnostic and treatment practices for breast cancers was conducted within the framework of the Francim network of cancer registries which covers 15% of the French population (about 9 million inhabitants). The quality and completeness of these population-based registries are certified every 4 years by an audit of the French National Committee of Registries. A representative sample of primary female breast cancers diagnosed in 2003 was randomised in 10 French district areas (Bas-Rhin, Calvados, Cote d'Or, Doubs, Hérault, Isère, Loire-Atlantique, Manche, Somme and Tarn) covered by a cancer registry. In this study, 1754 patients with primary non-metastatic invasive carcinomas were considered after exclusion of in situ, metastatic and non-carcinoma cancers.

Data collection

In addition to data routinely collected by registries, this survey also included extensive information on diagnostic procedures from the first imaging detection of breast cancer to the pathological confirmation of diagnosis and to the initiation of therapy. Details were obtained by reviewing clinical records in hospitals and clinics. Information was abstracted onto a standard form by trained recorders. Three main indications for mode of detection were documented: screening mammography as part of an organised programme (organised screening), screening mammography in the usual care system (opportunistic screening) and radiological examinations following clinical findings or symptoms (clinical diagnosis).

Calculation of waiting time

The "overall WT" was defined as the time interval between the first imaging procedure detecting the tumour and the first treatment. The first event corresponds to the woman's first access to investigation procedures, regardless of the medical referral. The overall WT was calculated for 1494 (85%) women. The date of first detection was not available for 15% of the patients who were excluded from our analyses.

We also defined two intermediate WTs for those patients having a pathological confirmation of malignancy before surgery. The "diagnostic WT" was calculated from the first abnormal imaging procedure to the pathological confirmation of malignancy. The "treatment WT" was calculated from the pathological confirmation to the first effective treatment. Indeed, the determinants and the possible corrective actions may be different for each of these intermediate WTs.

Statistical analysis

Because of skewness of WTs, the median was used as the descriptive measure of central tendency and the variability observed for the population was described using the 25th and 75th percentiles (Inter Quartile Range).

We analysed the effects of patients' characteristics, tumours' characteristics and diagnostic procedures on WTs. Patients' characteristics were: age in three categories (<50; 50–69; >69), comorbidity and place of residence. Among the tumour stage items (pT, pN, size in mm), the tumour size in mm was the most strongly correlated to WTs, so we decided to use only size (divided in three categories (≤10, [11–20], >20 mm)) in final models. The medical management procedures were the mode of detection, type and number of tissue samplings (fine needle aspiration or core biopsy), other imaging tests, multidisciplinary consulting meeting (MCM) implemented before treatment, type of first treatment (mainly surgery or chemotherapy), place of management gathered in 4 groups (public university hospitals, regional cancer centres, public hospitals, and private clinics).

Bivariate analyses were conducted to identify potential confounders and to explore multicollinearity. Multivariate Cox proportional-hazards regression models were performed to identify factors independently associated with waiting times. Adjusted hazard ratios (HR) and their 95%CI were calculated.

Statistical analyses were performed using R software version 2.11.0.[16]

Results

Of the 1494 women, the mean age was 60 years and 51% were aged between 50 and 69 years, which corresponded to the age of eligibility for organised breast cancer screening in France in 2003. The median time between the first radiological detection and the start of treatment was 34 days (IQR = 22–52) (Table 1). Women were 41.2% to experience an overall WT of less than 1 month and 19.4% an overall WT of more than 2 months. For the 730 (49%) women who actually had a pathological confirmation of malignancy before surgery, the intermediate median WTs were 7 days (IQR = 0–21) before, and 27 days (IQR = 16–39) after the pathological confirmation (Table 1). The diagnostic WT before pathological diagnosis was null in 212 women whose abnormal mammogram was immediately followed by a tissue sampling the same day. The proportion of null diagnostic WT was lower in women diagnosed by organised screening (18%) than by other modes of detection (30%) and in women who experienced a core biopsy (23%) rather than a fine needle aspiration (44%). Without these null cases, the median diagnostic WT would be quite longer (14 days, IQR = 6–29) when tissue sampling procedures were scheduled another day after the imaging test.

The distribution according to the patients' characteristics, tumours' characteristics and medical procedures is presented in Table 2 for overall WT and in Table 3 for intermediate WTs.

Factors related to the overall WT (Tables 2 and 4)

Younger women under 50 years were more likely to experience a shorter overall WT than older women (30 days versus 35 days for women 50–69 years and 37 days for women over 69 years). Conversely, the overall WT increased by 22% in the presence of at least one co-morbidity in multivariate models. Patients with tumours of 10 mm or smaller had a longer overall WT of about 10 days more compared to patients with tumours larger than 20 mm (HR = 1.35; 95%CI = 1.14; 1.59). Considering medical management, median WT was higher for screened versus unscreened-detected tumours: the adjusted HR of overall WT were 1.26 (95%CI = 1.10; 1.44) and 1.63 (95%CI = 1.32; 2.01) respectively for women having opportunistic and organised screening compared to women referred for clinical findings. The pathological diagnostic procedure also influenced the WT. The overall WT was longer for women with, than without a pathological diagnostic confirmation before the start of treatment (37 versus 32 days long) (Table 1). Compared to women with no tissue sampling before surgery (median = 31 days), the interval time increased to 36 days (HR = 1.19; 95%CI 0.98–1.45) for patients who experienced only one sampling and even more to 42 days (HR = 1.72; 95%CI = 1.25; 2.35) when two or more tissue