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Impact of age-related socio-economic and clinical determinants of quality of life among long-term breast cancer survivors

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ABSTRACT

Objectives: The main purpose of this study was to identify age-related socioeconomic and clinical determinants of quality of life among breast cancer survivors five years after the diagnosis. The secondary objective was to describe quality of life in the studied population according to age.
Study design: A cross-sectional survey in five-year breast cancer survivors was conducted in women diagnosed with breast cancer in 2007 and 2008 in Côte d'Or.
Main outcome measures: Quality of life was assessed with the SF-12, the EORTC-QLQ-C30 and the EORTC-QLQ-BR23 questionnaires. Socio-economic deprivation was assessed by the EPICES questionnaire. Social support was assessed by the Sarason questionnaire and clinical features were collected through the Côte d'Or breast cancer registry. Age-related determinants of quality of life were identified using multivariate mixed model analysis for each SF-12 dimension.
Results: Overall 396 women completed the questionnaires. Women aged <65 years had a better quality of life and a greater availability of social support than did women aged ≥65 years. Body mass index, relapse and EPICES were found to be determinants of quality of life in younger women ($p < 0.006$). For older women, comorbidities and EPICES deprivation scores were predictors of low quality of life scores ($p < 0.006$).
Conclusions: Five years after breast cancer diagnosis, disease severity did not affect quality of life. The major determinants of quality of life in younger women were disease relapse and EPICES deprivation scores while those in older women were comorbidities and EPICES deprivation scores.

1. Introduction

Breast cancer (BC) is an age-related disease. Indeed, the risk of being diagnosed with BC increases with age, and the number of elderly patients with BC is likely to increase in the coming years [1–4]. With this ageing population, BC in older women has become an important public health issue. However, the prognosis in BC is good thanks to improvements in BC screening, diagnosis and treatments, which have led to an increased number of long-term BC survivors [5,6]. In France, net survival at 5 years is 86% (source: Francim/Hospices civils de Lyon/INCa/InVS 2013). In this context, the assessment of quality of life (QoL) among BC survivors has become a major issue in BC management, and QoL is now an important clinical and societal outcome [7]. QoL is a multidimensional

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concept which includes three essential dimensions: physical, psychological and social [4,8]. Socio-demographic (income), general health (medical conditions) and treatment characteristics have all been found to be associated with QoL [4,5,7,9–11]. QoL is also greatly influenced by age [5,12,13]. Some studies have shown that older people with BC have lower QoL than younger patients [3,14] while other studies have reported that a younger age is a significant risk factor for poor QoL [15,16]. In addition, a French population-based study has shown clinically significant differences between breast cancer survivors five years after the diagnosis and the healthy population, however, these differences decreased with time and 15-year cancer survivors were generally no different from controls [5]. The present study was based on this French study in order to identify factors that negatively affected quality of life 5 years after breast cancer diagnosis by using a cross sectional survey. Furthermore, to the best of our knowledge, no study has reported data about age-related socioeconomic and clinical determinants of QoL using French population-based data. The main purpose of this study was to identify age-related socioeconomic and clinical determinants of QoL among BC survivors five years after the diagnosis. The secondary objective was to describe the QoL of the studied population according to age using the self-administered questionnaires of the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 and its BC module Breast 23 EORTC-QLQ-BR23.

2. Methods

2.1. Population

We conducted a cross-sectional survey in five-year BC survivors. These cases were selected through the French regional BC registry of Côte d'Or. All women living in Côte d'Or and newly diagnosed with primary invasive non-metastatic BC in 2007 and 2008 were contacted by mail five years after the diagnosis and invited to participate in the study. For women diagnosed in 2007, women who died before January 2013 were excluded, and for women diagnosed in 2008, women who died before January 2014 were excluded. The participants were mailed a series of questionnaires and an information letter, which presented the aim of the study and contained the legal information as well as the invitation to take part.

2.2. Studied variables and endpoints

Participants completed a series of questionnaires to collect QoL, social support and socio-economic data and clinical characteristics. These questionnaires are validated self-administered instruments translated and validated in French.

- QoL data were collected using:

- The Medical Outcomes Study 12-item Short-Form Health Survey (SF-12), which is a validated tool to assess general QoL [17,18]. The SF-12 incorporates 12 questions that generate eight scales: physical functioning, role-physical, role-emotional, bodily pain, social functioning, mental health, vitality, and general health perception. All of the scales were scored according to the standard scoring method described in the SF-12 scoring manual [19].

Each score ranges from 0 to 100 with higher scores representing a better level of QoL. Two additional scales, the Physical Component Summary (PCS) and Mental Component Summary (MCS) were computed from the eight scales according to the SF-12 scoring manual.

- The EORTC-QLQ-C30 and its BC module, Breast 23 (BR-23) are validated tools to assess QoL in cancer and more specifically BC [20]. The EORTC-QLQ-C30 contains five functional scales (physical, role, cognitive, emotional and social), global health status and financial difficulties, and eight symptom scales (fatigue, nausea and vomiting, pain, dyspnoea, insomnia, appetite loss, constipation and diarrhoea). The BC module comprises 23 questions that generate four functional scales (body image, sexual functioning, sexual enjoyment, and future perspectives) and four symptom scales (systemic therapy side effects, breast symptoms, arm symptoms, and upset by hair loss).

Scores were generated if at least half of the items from the scale had been answered. These scores vary from 0 (worst) to 100 (best) for the functional and global health parameters and from 0 (best) to 100 (worst) for symptom parameters and financial difficulties.

- Perceived social support was assessed with Sarason's Social Support Questionnaire (SSQ) [21]. The SSQ contains six items measuring two scales: availability of and satisfaction with the perceived social support. Each item represents a situation in which the patient should need social support, they were asked to count the number of persons providing support and to evaluate satisfaction with the support provided. The scales were scored according to Sarason's recommendations. Satisfaction scores range from 6 to 36 and availability scores range from 0 to 54. Each point of the social support availability score represents one person providing support for one item. A higher social support satisfaction score represents better perceived social support.
- Socio-economic information was assessed with the «Evaluation de la précarité et des inégalités de santé pour les Centres d'Examen de Santé» (EPICES) questionnaire [22]. The EPICES questionnaire contains 11 items with two responses (yes/no) and generates one deprivation scale. The deprivation scale was scored according to the EPICES guidelines. These scores vary from 0 to 100. A threshold of 30 determines the level of deprivation with higher deprivation for a score greater than 30.

Additionally, a questionnaire was used to collect clinical information about patients' weight, height and education status and disease recurrence.

The characteristics of patients and tumours, such as age at diagnosis, Charlson's co-morbidity score, cancer stage, histological Scarff Bloom and Richardson (SBR) grade, molecular subtypes (luminal or basal), and human epidermal growth factor receptor 2 (HER2) status, as well as treatments, were collected through the Côte d'Or BC registry database. The tumour stage was categorised according to the American Joint Committee on Cancer (AJCC) stage of the sixth edition TNM (Tumour Nodes Metastasis) Stage grouping [23].

2.3. Statistical methods

Continuous variables are described as means, standard deviations (SD), and medians, and qualitative variables as percentages. The percentage of missing values is also provided. The characteristics of responders and non-responders were compared using Pearson's χ^2 test for categorical variables and Student's *t*-test and Mann–Whitney test for age at diagnosis as a continuous variable.

The age at diagnosis was categorised into two classes: <65 years (younger) and ≥65 years (older). Body mass index and EPICES deprivation scores were described as categorical variables. Body mass index cut-offs were set at 25 (≤25: low and normal weight, >25: overweight or obesity); because of the small number of women with body mass index <18.5 (nine women), they were classified with women with body mass index between 18.5 and 25. Charlson's scores were categorised as 0 (no comorbidity) and ≥1 (at