Determinants of return at work of breast cancer patients: results from the OPTISOINS01 French prospective study

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ABSTRACT

Introduction Return to work (RTW) after breast cancer (BC) is still a new field of research. The factors determining shorter sick leave duration of patients with BC have not been clearly identified. The aim of this study was to describe work during BC treatment and to identify factors associated with sick leave duration.

Materials and methods An observational, prospective, multicentre study was conducted among women with operable BC. A logbook was given to all working patients to record sociodemographic and work-related data over a 1-year period.

Results Work-related data after BC were available for 178 BC patients (60%). The median age at diagnosis was 50 years (27–77), 87.9% of patients had an invasive form of BC and 25.3% a lymph node involvement. 25.9% had a radical surgery and 24.2% had an axillary dissection. Radiotherapy was performed in 90.9% of patients and chemotherapy in 48.1%. Sick leave was prescribed for 165 patients (92.7%) for a median of 155 days. On univariate analysis, invasive BC (p=0.025), lymph node involvement (p=0.005), radical surgery (p=0.025), axillary dissection (p=0.004), chemotherapy (p<0.001), personal income <1900/month (p=0.03) and not having received the patient information booklet on RTW (p=0.047) were found to be associated with a longer duration of sick leave. On multivariate analysis, chemotherapy was found to be associated with longer sick leave (OR: 3.5; 95% CI 1.6 to 7.9; p=0.002). The cost of sick leave to French National Health Insurance was fourfold higher in the case of chemotherapy (p<0.001).

Conclusion Advanced disease and chemotherapy are major factors that influence sick leave duration during the management of BC.

Trial registration number NCT02813317.

INTRODUCTION

Improvements in early detection and treatment have resulted in an increasing number of breast cancer (BC) survivors.1 Treatments mostly focus on curing the disease and preventing metastatic relapse. About one-third of women diagnosed with BC are under the age of 55 with a 10-year survival close to 80%.2 Many patients therefore recover and resume their activities of daily living during or after treatment. Return to work (RTW) is an event at the end of sick leave, consisting in resuming professional activity. RTW after BC is still a new but important aspect of survivorship research, not only from a societal point of view, as it provides financial resources for rehabilitation of cancer survivors and contributes to psychosocial well-being, including physical and mental health.3 Some BC cancer survivors experience reduced work ability.4-8 Difficulties at work or unemployment differ according to the type of BC treatment. Cancer treatment varies according to the stage of the disease and can include surgery, chemotherapy, radiotherapy and hormone therapy. For many patients with cancer, RTW helps them to recover from treatment and also constitutes a positive step towards the future. The identification of factors that maintain patients at work during and after BC treatment could help healthcare professionals to more accurately identify patients at risk of RTW-related difficulties in order to provide them with adapted support during BC management. The aim of this prospective study was to describe work during and after BC management and identify factors associated with either cessation or maintenance at work.

MATERIALS AND METHODS

OPTISOINS01 was an observational, prospective, multicentre study conducted from December 2014 to March 2016 among patients with BC from a regional health...
Six hundred and four patients with a median age of 58 years (range: 24–98) were included in the Optisoins01 study, including 297 patients (48.2%) who were working at the time of BC diagnosis. The present study focused on these 297 patients.

Detailed patient characteristics and cancer characteristics are presented in table 1. The median age of the women was 50 (range: 27–77) years, 54 women (18.2%) were single, 153 (51.5%) were married, 39 (13.1%) were divorced and 3 (1.0%) were widows. Two hundred and sixty-one patients (87.9%) had invasive BC and 35 (11.8%) had in situ BC. Seventy-five women (25.3%) presented with axillary lymph node involvement.

Two hundred and twenty women (74.1%) underwent breast-conserving surgery and 77 (25.9%) underwent radical mastectomy (table 1). A sentinel lymph node procedure was performed for 203 patients (68.4%). Seventy patients required at least one reoperation for the following reasons: positive surgical margins and secondary mastectomy, sentinel lymph node procedure following discovery of an invasive tumour, axillary dissection following positive sentinel lymph node biopsy and surgical complications (abscess, haematoma and so on). After surgery, 90.9% of patients received radiotherapy 48.1% of patients received adjuvant chemotherapy and 74.1% of patients received hormone therapy.

Most patients were executives (31.4%) or employees (33.3%). Most patients (47.1%) had a monthly income >€1900. Work data after BC were available for 178 patients (60%, online supplemental figure 1). Patients who did not complete the 1work questionnaire in the logbook during 1 year were globally less compliant with the study and less medicalised (online supplemental table 1). Sick leave was prescribed for 165 patients (92.7%). Patients had only one sick leave in 52.2% of cases, two sick leaves in 21.9% of cases and three or more sick leaves in 18.5% of cases. Median duration of sick leave was 155 days (range: 5–365). After treatment, seven patients (3.9%) lost their jobs and 46.1% had reduced income. Patients encountered difficulties with their coworkers in 3.4% of cases, with their superiors in...
3.9% of cases and for undocumented reasons in 12.9% of cases. Work-related factors are summarised in table 2.

On univariate analysis, the presence of clinical signs leading to a diagnosis of BC (p<0.001), an invasive form of BC (p=0.02), lymph node involvement (p=0.005), radical surgery (p=0.02), axillary dissection (p<0.001), chemotherapy (p<0.001), personal income <€1900/month (p=0.03) and not having received the work and cancer information booklet (p=0.047) were associated with a longer total duration of sick leave (table 3). Moreover, patients...
| Patient characteristics | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|------------------------|---------------------------|---------------------------|---------|
|                        | n or Median | % or Range | n or Median | % or Range |         |
| Age (years)            | 50.6        | 27–59      | 50          | 29–77      | 0.52    |
| Type of occupation     |             |            |             |            | 0.09    |
| Farmer                 | 0           | 0          | 0           | 0          |         |
| Self-employed          | 3           | 3.8        | 1           | 1.3        |         |
| Executive              | 36          | 45.6       | 29          | 37.7       |         |
| Employee               | 25          | 31.6       | 38          | 49.4       |         |
| Intermediate profession| 13          | 16.5       | 7           | 9.1        |         |
| Blue-collar worker     | 1           | 1.3        | 0           | 0          |         |
| NA                     | 1           | 1.3        | 2           |            |         |
| Personal income per month (€) | | | | | 0.03 |
| <1900                  | 25          | 31.6       | 37          | 48.1       |         |
| >1900                  | 54          | 68.4       | 38          | 49.4       |         |
| NA                     | 0           | 0          | 2           | 2.6        |         |
| Marital status         |             |            |             |            | 0.76    |
| Single                 | 18          | 22.8       | 12          | 15.6       |         |
| Married                | 47          | 59.5       | 49          | 63.6       |         |
| Divorced               | 12          | 15.2       | 14          | 18.2       |         |
| Widow                  | 1           | 1.3        | 1           | 1.3        |         |
| NA                     | 1           | 1.3        | 1           | 1.3        |         |
| Breast cancer characteristics | | | | | <0.001 |
| Type of cancer         |             |            |             |            |         |
| Invasive               | 63          | 79.7       | 74          | 96.1       |         |
| In situ                | 16          | 20.3       | 3           | 3.9        |         |
| Lymph node involvement |             |            |             |            | 0.005   |
| Yes                    | 11          | 13.9       | 26          | 33.8       |         |
| No                     | 68          | 86.1       | 52          | 67.5       |         |
| Surgery                |             |            |             |            | 0.02    |
| Breast surgery         |             |            |             |            |         |
| Conservative           | 66          | 83.5       | 50          | 64.9       |         |
| Radical               | 13          | 16.5       | 27          | 35.1       |         |
| Lymph node surgery     |             |            |             |            | <0.001  |
| Sentinel lymph node procedure | 62 | 78.5   | 48 | 62.3 |         |
| Axillary dissection    | 9           | 11.4       | 26          | 33.8       |         |
| NA                     | 8           | 10.1       | 3           | 3.9        |         |
| Surgical revision      |             |            |             |            | 0.06    |
| Yes                    | 13          | 16.5       | 23          | 29.9       |         |
| No                     | 66          | 83.5       | 54          | 70.1       |         |
| Radiotherapy           |             |            |             |            | 0.53    |
| Yes                    | 72          | 91.1       | 74          | 96.1       |         |
| No                     | 7           | 8.9        | 3           | 3.9        |         |
| Chemotherapy           |             |            |             |            | <0.001  |
| Yes                    | 25          | 31.6       | 56          | 72.7       |         |
| No                     | 54          | 68.4       | 21          | 27.3       |         |
with longer sick leave were more likely to have reduced income after treatment of their disease (p=0.0012).

On multivariate analysis, chemotherapy was the only independent factor associated with longer sick leave (OR: 3.5, 95% CI 1.6 to 7.9, p=0.002). Patients treated by chemotherapy had longer sick leave than those not treated by chemotherapy (figure 1). The difference in terms of the 1-year distribution of sick leave was not statistically significant between patients according to whether or not they had received the work information booklet (figure 2).

Considering the working population of OPTISOINS01 study with complete data on sick leave and salary, the median cost of sick leave for National Health Insurance was €8841 per patient per year from diagnosis.

| Trastuzumab | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-------------|---------------------------|-----------------------------|----------|
| Yes         | 9                         | 11.4                        | 12       | 15.6   | 0.54 |
| No          | 16                        | 20.3                        | 40       | 51.9   |
| NA          | 54                        | 68.4                        | 25       | 32.5   |

| Hormone therapy | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-----------------|---------------------------|-----------------------------|----------|
| Yes             | 50                        | 63.3                        | 61       | 79.2   | 0.05 |
| No              | 29                        | 36.7                        | 16       | 20.8   |

**Patient management**

| Modes of diagnosis | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|--------------------|---------------------------|-----------------------------|----------|
| Trastuzumab        | 0.54                      |                             |          |
| Yes                | 9                         | 11.4                        | 12       | 15.6   |
| No                 | 16                        | 20.3                        | 40       | 51.9   |
| NA                 | 54                        | 68.4                        | 25       | 32.5   |

| Hormone therapy    | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|--------------------|---------------------------|-----------------------------|----------|
| Yes                | 50                        | 63.3                        | 61       | 79.2   |
| No                 | 29                        | 36.7                        | 16       | 20.8   |

| Organised screening | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|---------------------|---------------------------|-----------------------------|----------|
| Yes                 | 15                        | 19                          | 21       | 27.3   | <0.001 |
| No                  | 43                        | 54.4                        | 20       | 26     |
| NA                  | 21                        | 26.6                        | 36       | 46.8   |

| Clinical signs      | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|---------------------|---------------------------|-----------------------------|----------|
| Yes                 | 58                        | 73.4                        | 34       | 44.2   | <0.001 |
| No                  | 21                        | 26.6                        | 43       | 55.8   |

| Type of hospitalisation | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-------------------------|---------------------------|-----------------------------|----------|
| Outpatient surgery      | 64                        | 81                          | 52       | 67.5   | 0.047 |
| Inpatient surgery       | 15                        | 19                          | 25       | 32.5   |

| Work and cancer information booklet | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|------------------------------------|---------------------------|-----------------------------|----------|
| Yes                                | 64                        | 81                          | 52       | 67.5   | 0.047 |
| No                                 | 15                        | 19                          | 25       | 32.5   |

| Return to work                    | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-----------------------------------|---------------------------|-----------------------------|----------|
| Dismissal                         | 1                         | 1.3                         | 3        | 3.9    | 0.62  |

| Income change                     | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-----------------------------------|---------------------------|-----------------------------|----------|
| Decreased                         | 23                        | 29.1                        | 48       | 62.3   | <0.001 |
| Increased                         | 0                         | 0                           | 2        | 2.6    |
| Stable                            | 37                        | 46.8                        | 24       | 31.2   |
| NA                                | 19                        | 24.1                        | 3        | 3.9    |

| Decreased income (%)              | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-----------------------------------|---------------------------|-----------------------------|----------|
| <10                               | 11                        | 13.9                        | 21       | 27.3   |
| 10–30                             | 4                         | 5.1                         | 7        | 9.1    |
| 30–60                             | 0                         | 0                           | 4        | 5.2    |
| >60%                              | 0                         | 0                           | 3        | 3.9    |
| NA                                | 64                        | 81                          | 42       | 54.5   |

| Difficulties at work              | Sick leave <155 days, n=79 | Sick leave ≥155, days n=77 | P values |
|-----------------------------------|---------------------------|-----------------------------|----------|
| With coworkers                    | 2                         | 2.5                         | 3        | 3.9    | 0.67  |
| With superiors                    | 0                         | 0                           | 6        | 7.8    | 0.17  |
| Other                             | 7                         | 8.9                         | 14       | 18.2   | 0.93  |

Bold values means p<0.05 (statistically significant).
only determinant of sick leave costs found in this study was the administration of chemotherapy, with a fourfold higher median allowance for patients treated with adjuvant chemotherapy.

**DISCUSSION**

Although many BC cancer survivors are able to return to a normal work life after treatment, our study confirms that many women of working ages do not. Sick leave is frequently prescribed and is often long, with a median sick leave of 155 days in this study.

Factors associated with long sick leave (>155 days) were severe or advanced forms of BC. The duration of sick leave was also associated with the mode of diagnosis, as patients diagnosed by breast screening presented shorter sick leaves. Public health authorities should therefore promote breast screening in order to decrease the proportion of advanced forms of BC and aggressive therapies with severe consequences on work and personal activities. Consequently, longer sick leave was also associated with more aggressive therapy, such as radical surgery, axillary dissection and chemotherapy. These results are similar to those published in the literature. Chemotherapy is an aggressive treatment that can be necessary in order to improve survival, but which has long-lasting consequences in terms of self-esteem (alopecia...), chronic pain (neuropathy...) and chronic fatigue, that play an important role in RTW and maintenance at work. BC survivors may have to deal with the side effects specific to this type of treatment. Although many side effects of chemotherapy are only temporary, some studies have shown that chemotherapy may impact on cognitive functioning and fatigue up to 10 years after diagnosis. Cognitive functioning and fatigue have both been associated with impaired work functioning. Munir et al reported that up to 62%–84% of women resumed work either during treatment with chemotherapy or following completion of treatment. As a result of their cognitive limitations, women reported that they experienced difficulties with their work ability, particularly difficulties doing multiple tasks, reduced clarity of decisions, deficits in clear thinking and feelings of being inept due to shortterm memory. Rapid progress is being made in the field of chemotherapy with the routine use of new genomic signature tests that allow more accurate targeting of patient likely to benefit from chemotherapy. According to Nesvold et al and Eaker et al mastectomy and axillary lymph node dissection may influence working life long after treatment due to an increased risk of chronic pain. BC survivors are more likely to suffer from upper extremity impairments or lymphoedema than are other cancer survivors, which are responsible for difficulties at returning to work.

The work and cancer information booklet appeared to help patients RTW with significantly shorter sick leave in univariate analysis, but not in the multivariate analysis. However, this suggests that an action, such as an active support, could help to reduce sick leave duration. The information booklet advises women to attend the occupational medicine service. In France, occupational medicine plays an essential role, but the patient is not obliged to consult the occupational physician when sick leave is <3 months. However, at 3 months, the occupational physician and the employee must determine the modalities of RTW, based on the employee’s state of health and the characteristics of the workplace. These arrangements concern the employee himself and the work collective with, if necessary, actions so that the reception is assured to the return. Setting up of a schedule, reduction of working hours, modification of physical, mental or workplace loads can also be instituted at the time of RTW. The occupational physician can provide recommendations to

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**Figure 1** Percentage of patients on sick leave at 1-year follow-up depending on the presence or absence of chemotherapy.

**Figure 2** Percentage of patients on sick leave at 1-year follow-up depending on whether or not they had been given the work information booklet.
the employer, unless the employer refuses. The results obtained with this handbook are particularly encouraging and suggest that more individual supports should be developed. Health coaching by telephone and/or face-to-face interview have already been tested, showing positive significant outcomes on physical activity, body mass index, pain management, acceptance of disease and self-confidence among cancer survivors. Coaching methods have never been tested in the management of working patients during cancer treatment maintenance. Our Institute is therefore setting up a prospective randomised study (OPTICOACH) with tailored support intervention to enhance RTW after BC in collaboration with a professional coach, consisting of individual interviews or small group workshops over a period of 3 years.

Difficulties at returning to work appear to extend over a period of many years. Sevellec et al. showed that 6 years after returning to work, one employee out of two was still working in the same company. Rather than disappearing, the difficulties identified many years after BC persist for a long time after stopping treatment. It is therefore essential to identify the factors associated with longer sick leave and RTW difficulties in order to help working patients and prevent these long-term problems. The VICAN 2 study focused on the factors associated with difficulties at RTW. This large study was carried out in 2014 by the French National Cancer Institute, on the living conditions of people with cancer (not only BC), 2 years after the diagnosis. The people most vulnerable to job loss 2 years after the cancer diagnosis are mainly those working in the so-called socioprofessional execution categories, the youngest and oldest, married people with a level of education below the baccalaureate level and those with precarious contracts.

One of the potential biases of this study concerns the characteristics of the study population, as almost the majority of women belonged to the wealthiest social classes, as 45.6% of patients were executives and only 1.3% were blue-collar workers. More than 68% of patients had a personal monthly income >€1900 and 36.7% had a personal monthly income >€2600. This distribution does not exactly reflect French society; in France, according to the INSEE statistics of 2014, the median monthly income was €1772. Similarly to our results, a Canadian team has shown that women with an annual income <C$20 000 were less likely to RTW than those whose income exceeded C$50 000. The French social protection system also plays a role, as it provides cancer survivors with the possibility of replacement income, allowing women to decide whether or not they wish to RTW immediately. Providing assistance and support to all working patients should therefore be a priority.

CONCLUSION

Advanced disease and chemotherapy are major factors that influence RTW with longer sick leave. Systematic screening or use of innovative tools, such as genomic signatures, can facilitate earlier diagnosis and reduce aggressive therapies.

Depending on the type of treatment, stage of the disease and type of occupation, information and coaching methods with the occupational medicine service should systematically be given to working women, helping them to anticipate job adjustments with flexibility of work schedule for example.

Personalised coaching methods have been successfully used to promote acceptance of disease and self-confidence and should be tested in the management of RTW.

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Contributors DH, RR and SB designed the study. BA and SN contributed to the design and implementation of the research. SB and A-LS performed the health economic analysis. AA and DH performed all the remaining statistical analysis and wrote the manuscript. CH and FR contributed to the clinical study, patients’ inclusion and analysis of the results. All the authors reviewed and approved the final version of the manuscript.

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Competing interests None declared.

Patient consent Obtained.

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