ORIGINAL ARTICLE

Chronic pain among patients treated for breast cancer: Prevalence and associates factors

Douleur chronique chez les patientes traitées pour un cancer du sein : Prévalence et facteurs associés

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Abstract

Objectives: Chronic pain has emerged as a significant health issue among women treated for breast cancer, representing a substantial burden that negatively affects quality of life. This study aimed to determine the prevalence and characteristics of chronic pain among Tunisian breast cancer survivors.

Methods: We conducted a cross-sectional descriptive and analytical study including 100 Tunisian women treated for breast cancer at the Medical Oncology Department of Fattouma Bourguiba University Hospital (Monastir, Tunisia). Data collected included sociodemographic and clinical characteristics, lifestyle habits, and medical history. Validated instruments were used, including the Brief Pain Inventory (BPI), Pain Catastrophizing Scale (PCS), DN4 questionnaire, Hospital Anxiety and Depression Scale (HADS), and Family APGAR score.

Results: The prevalence of chronic pain in our population was 100%. All participants reported persistent pain following breast cancer surgery, without any other identified medical cause. The most common pain locations were the breast and ipsilateral upper limb. Pain interference was generally mild in both affective and activity domains. Most participants (88%) belonged to highly functional families. Higher pain intensity was significantly associated with a greater number of children and a history of dysthyroidism. Multivariate analysis identified body mass index, number of children, and number of lymph nodes removed as independent predictors of pain intensity. Higher pain intensity was also associated with increased anxiety levels.

Conclusions: Chronic pain is highly prevalent among breast cancer survivors and is influenced by multiple factors, highlighting the need for comprehensive assessment and management strategies.

Keywords : Chronic pain ; Breast cancer survivors ; Mastectomy ; Breast conserving surgery ; Quality of life

Résumé

Objectifs : La douleur chronique est devenue un problème de santé important chez les femmes traitées pour le cancer du sein, représentant un véritable fardeau qui affecte leur qualité de vie. L'objectif principal de cette étude était de déterminer la prévalence et les caractéristiques de la douleur chronique chez les survivantes tunisiennes du cancer du sein.

Méthodes : Cette étude descriptive et analytique transversale a inclus 100 femmes tunisiennes traitées pour un cancer du sein au département d'oncologie médicale de l'hôpital universitaire Fattouma Bourguiba, à Monastir. Des données ont été collectées sur les caractéristiques sociodémographiques et cliniques, les habitudes de mode de vie et les antécédents médicaux. Des instruments validés tels que l'Indice de Charge de la Douleur (PBI), l'Échelle de Catastrophisation de la Douleur (PCS), le questionnaire DN4 et le score APGAR familial ont été utilisés pour évaluer les caractéristiques de la douleur, les composantes neuropathiques et le fonctionnement familial.

Résultats : La prévalence de la douleur chronique dans notre population était de 100 %. Tous les participants ont signalé une douleur persistante après une chirurgie du cancer du sein, sans autre cause médicale identifiée. Les sites de douleur les plus fréquents étaient le sein et le membre supérieur ipsilatéral. L'interférence de la douleur était généralement légère dans les domaines affectif et d'activité. Selon l'APGAR familial, 88 % des participants appartenaient à des familles très fonctionnelles. Une intensité de douleur plus élevée était significativement associée à un plus grand nombre d'enfants et à des antécédents personnels de dysthyroïdie. L'analyse multivariée a identifié l'IMC, le nombre d'enfants et le nombre de ganglions lymphatiques retirés comme prédicteurs indépendants de l'intensité de la douleur. Une plus grande intensité de la douleur était également corrélée à des niveaux d'anxiété plus élevés.

Conclusions : La douleur chronique est un problème répandu et multifactoriel chez les survivantes du cancer du sein et nécessite une évaluation et une prise en charge complètes.

Mots clés: Chronic pain; Breast cancer survivors; Mastectomy; Breast-conserving surgery; Quality of life

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LA TUNISIE MEDICALE-2026; Vol 104 (05): 678-682 DOI: 10.62438/tunismed.v104i05.6520

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Introduction

Breast cancer is nowadays the most common cancer in the world and among women . It has the highest incidence among all invasive cancer types around the globe as it represents 11.7% of all cancer cases and it has become a true burden with increasing incidence and mortality (1,2).Fortunately the early detection and the progress accomplished in breast cancer treatments is helping to manage the disease and reduce its mortality as the survival rates increased during the last decade reaching 90% (3-6).However, new health problems have emerged due to this progress and the increasing efficacy of breast cancer treatments, this implies the risk of developing several events and post-treatment complications such as chronic pain that currently represents a true burden to breast cancer survivors (6,7).Chronic pain is a major health problem affecting around 18% of the world's general population (8) .It is defined according to the current international association for the study of pain (IASP) as an unpleasant experience sensorially and emotionally that is associated to potential or actual tissue damage or described as such (9). Chronic pain designate a pain that lasts more than 3 months (10).

As for its consequences, It has been proven that patients suffering from post-treatment chronic pain are more likely to develop different mental problems such as anxiety, depression and sleeping disorders (11–14) which can eventually lead to other complications such as opioid addiction.

Our main objective in this study is to determine the prevalence and the characteristics of chronic pain amid a population of Tunisian breast cancer survivors, that along with trying to prove the existence of associated factors to this pain and its clinical impact on patients' lives.

Methods

This was a cross-sectional descriptive and analytical study conducted on 100 women treated for breast cancer at the Medical Oncology Department of Fattouma Bourguiba University Hospital (Monastir, Tunisia) between June 2021 and February 2022. Patients were invited to participate and completed a structured survey after providing informed consent. Data collected included sociodemographic characteristics, clinical history, cancer-related data, and chronic pain characteristics. Validated tools included the Brief Pain Inventory (BPI) (15,16), Pain Catastrophizing Scale (PCS) (17,18), DN4 questionnaire (19,20), Hospital Anxiety and Depression Scale (HADS) (21), and Family APGAR score (22). Statistical analysis was performed using Student's t-test, Mann–Whitney U test, Chi-square test, or Fisher's exact test, as appropriate. Multivariate logistic regression analysis was conducted to identify independent predictors of pain intensity.

Results

Descriptive analysis

A total of 100 female breast cancer survivors were included. The mean age was 51.9 ± 10.6 years. Most patients underwent mastectomy (67%), received chemotherapy (91%) and radiotherapy (88%), while 66% were on endocrine therapy.

Chronic pain was reported in all patients, with a duration of 2–5 years in 99% of cases. Pain was mainly localized in the breast (72%) and upper limb (27%). Low pain intensity was observed in 62% of patients, whereas 38% reported moderate to high intensity pain. The median Family APGAR score was 10, indicating predominantly well-functioning families (Table 1).

Table 1. Baseline sociodemographic and clinical characteristics (n = 100)

Variable	Value
Age (years), mean ± SD	51.9 ± 10.6
Mastectomy, n (%)	67 (67)
Breast-conserving surgery, n (%)	33 (33)
Chemotherapy, n (%)	91 (91)
Radiotherapy, n (%)	88 (88)
Trastuzumab, n (%)	21 (21)
Endocrine therapy (ongoing), n (%)	66 (66)
Pain duration 2–5 years, n (%)	99 (99)
Breast pain location, n (%)	72 (72)
Upper limb pain, n (%)	27 (27)
Low pain intensity, n (%)	62 (62)
Moderate–high pain intensity, n (%)	38 (38)
Family APGAR score, median [IQR]	10 [10–10]

Analytical analysis

Pain intensity was significantly associated with several clinical and psychosocial factors. Patients with moderate to high pain intensity had higher pain catastrophizing scores and greater pain interference compared to those with low-intensity pain ($p = 0.001$ and $p < 0.001$, respectively). Both affective and activity-related interference scores were also significantly higher in this group ($p < 0.001$). In addition, anxiety levels (HADS-A) were significantly elevated in patients with higher pain intensity ($p = 0.013$) (Table 2).

Table 2. Pain-related outcomes according to pain intensity

Variable	Low intensity (n=62)	Moderate–high intensity (n=38)	p-value
Pain catastrophizing	4 [2–11]	9 [7–13]	0.001
Pain interference	13 [5–19]	20 [15–30]	<0.001
Affective interference	1.33 [0.6–2.3]	2.66 [1.7–4.4]	<0.001
Activity interference	2 [1–2.8]	3 [2.3–4]	<0.001
HADS-A	7.5 [4–11]	10 [8–12]	0.013

In multivariate analysis, higher body mass index (BMI) (OR = 1.41; p = 0.026), greater number of children (OR = 3.46; p = 0.016), and higher anxiety scores (OR = 1.26; p = 0.039) were independently associated with increased pain intensity (Table 3).

Table 3. Multivariate analysis of factors associated with higher pain intensity

Variable	OR (95% CI)	p-value
BMI	1.41 (1.04–1.93)	0.026
Number of children	3.46 (1.26–9.49)	0.016
HADS-A	1.26 (1.01–1.50)	0.039

Discussion

Clinical implications

Estimating the prevalence of chronic pain among breast cancer survivors is essential to help clinicians better identify and manage this frequent and often under-recognized condition. In our study, the prevalence of chronic pain was 100%, as all patients reported pain persisting for more than three months after surgery. This prevalence is considerably higher than that reported in the literature, where chronic pain affects approximately 32% of women following breast cancer surgery (23), with some studies suggesting that up to two-thirds of patients may eventually develop persistent pain (24–26). This discrepancy raises important questions about potential contributing factors in our population, including cultural, psychological, or healthcare-related differences. All patients in our cohort reported that pain onset occurred after surgical treatment. Previous studies have shown variability in the onset of chronic post-surgical pain, particularly phantom pain, which may occur immediately after surgery or be delayed by up to two years (27). The pathophysiology of chronic pain in this setting is often related to nerve injury or lymphatic disruption during surgical procedures such as mastectomy, axillary lymph node dissection, or sentinel lymph node biopsy (28).The most frequently reported pain locations in our study were the breast and upper limb, which is consistent with previous findings. Peintinger (2003) reported pain predominantly in the arm and axillary regions (27,29), while Langer et al. (2007) identified the shoulder and arm as the most common sites (27,30). In terms of pain intensity, most patients experienced low-intensity pain (62%), while 38% reported moderate to high intensity. These findings are in line with previous reports. A systematic review by Wang et al. (2018), including 76 studies, found that among 1,414 patients, 19% reported mild pain, 11.4% moderate pain, and 10.9% severe pain (31). Our analysis showed that the number of children was significantly associated with pain intensity in both univariate and multivariate analyses, with higher intensity observed in patients with more children. Similar findings have been reported by Johannsen et al. (2015) and Alkan et al. (2016) (32,33). In contrast, we did not find a significant association between pain intensity and surgical or chemotherapy-related factors. This differs from findings by Alkan et al. (2016) and Macdonald et al. (2005) (32,33), who suggested that pain intensity decreases over time following surgery, potentially due to reduced treatment-related side effects and psychological adaptation. Other studies have reported an association between chemotherapy and increased pain intensity, likely related to treatment-induced neurotoxicity (35–37). However, in our study, no association was found between pain intensity and endocrine therapy or trastuzumab, which is consistent with previous reports (38,39). Pain interference with daily activities was overall mild in our cohort, as were its affective and activity-related components. Consistent with the literature, pain interference was strongly associated with pain intensity, with higher intensity leading to greater functional impairment and reduced quality of life (40–43). Chronic pain has been shown to impact multiple aspects of daily living, including mood, social relationships, work, and overall life satisfaction (23,44). Pain catastrophizing was relatively low in our study population, likely reflecting the predominance of low-intensity pain. However, as widely reported, catastrophizing is closely associated with both pain intensity and functional impairment (42,45,46). Patients with higher levels of catastrophizing tend to have poorer coping strategies and are more likely to experience anxiety, depression, and disability (44,47,48). Our findings also demonstrated a significant association between pain intensity and anxiety, with higher HADS-A scores observed in patients with more severe pain. This is consistent with previous studies (37,39,44,49) and highlights the psychological burden of chronic pain. In contrast, no significant association was found between pain intensity and depression (HADS-D), in agreement with findings from Andersen et al. (2015), Bruce et al. (2012), Spivey et al. (2018), and Katz et al. (2005) (39,44,49,50).Finally, most patients in our study belonged to highly functional families according to the Family APGAR score. This strong family support may partially explain the predominance of low-intensity pain observed in our cohort.

Study limitations

This study has several limitations that should be acknowledged. First, the relatively small sample size (n = 100) may limit the statistical power and generalizability of the findings. Second, no specific validated instruments were used to assess fatigue and sleep disorders, which are important components of the chronic pain experience and may have influenced the results. Third, the study is subject to potential selection and recall bias, particularly regarding the self-reported onset and duration of pain. Finally, the cross-sectional design precludes any inference of causal relationships between the variables studied.

Conclusion

Breast cancer is currently the most common cancer among women worldwide, with a steadily increasing

incidence, and remains a leading cause of cancer-related mortality. Advances in treatment have significantly improved survival; however, they have also led to the emergence of new health challenges. Among these, chronic pain has become a major issue affecting breast cancer survivors, with a substantial impact on quality of life, often causing significant distress and functional impairment. Chronic pain in this population remains a complex and multifactorial condition that requires further investigation. A multidisciplinary approach is essential to identify patients at risk of developing chronic pain following breast cancer treatment, particularly those whose quality of life is most likely to be affected. Early identification of these risk factors would enable timely counseling and targeted interventions, ultimately helping to prevent or reduce the burden of chronic pain.

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