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Review

Sexual Function in Breast Cancer Patients: A Review of the Literature

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Abstract

Background: Breast cancer (BC) is the most prevalent cancer among females worldwide. Despite having survival rates beyond 90% in 5 years nowadays, BC has also the highest rates of lost disability-adjusted life years (DALYs) among all cancers. Sexual dysfunction (SD) is one of the most important causes of the problem, affecting between 40–80% of BC survivors. However, SD remains underdiagnosed and undertreated in the clinical practice. Therefore, this review is aimed to evaluate the assessment of SD in Breast Cancer Survivors (BCS) as well as specific causes affecting their sexual function and the potential therapeutic options for these patients. **Methods**: In December 2021, a search of observational studies evaluating the sexual function in BCS was performed through Ovid Medline, Embase, PubMed, Cochrane register of controlled trials (CCTR), Cochrane database of systematic reviews (CDSR), Cumulative Index to Nursing & Allied Health Literature (CINAHL) and Google scholar to identify potentially relevant publications. Articles that evaluated non-gynecological cancers were excluded, as well as those focusing on the sexuality of men. **Results**: Despite being such a prevalent entity and given the particularities of how BC affects the sexuality of patients, SD is not usually discussed in the clinical practice in BCS for various reasons, remaining therefore underdiagnosed and undertreated. SD in BC patients has a multifactorial aetiology, including among others, the effect of BC treatments (related to vaginal mucosae, fatigue, and joint pain), the psychological impact of the diagnostic itself and sociocultural influences related to the alteration of the breast. Various strategies have been suggested to treat SD in BC patients, including pharmacological, physical and psychological options. Evidence shows that vaginal moisturizers and psyco-educational therapies focusing on sexual health and couple-based ones improve sexual function; while systemic treatments and general psychological therapy have not demonstrated benefit. Regarding exercise programmes, body image perception has shown to be improved after a one-year strength training program. **Conclusions**: SD is a multifactorial condition that affects the quality of life of millions of BCS worldwide, severely underdiagnosed and undertreated up to date. A systematic assessment of sexual function in BCS could be useful to diagnose all cases prematurely to give adequate care and prevent its worsening. Specific treatment options for BCS are key potential investigation targets for the near future.

Keywords: breast cancer; sexual health; breast cancer survivors; sexual dysfunction; sexuality

1. Introduction

Breast cancer (BC) is the most prevalent cancer among females worldwide [1,2]. In 2020, there were 2.3 million women diagnosed with BC [1]. According to current statistics, it is estimated that in 2021 there will be 281,550 new cases of female BC [2]. Furthermore, approximately 12.9% of women will be diagnosed with BC during their lifetime [2].

During the last decades, thanks to improvement in BC treatments, survival rates of BC have increased drastically (90.3% in 5 years) [2], and new challenges are appearing to treat Breast Cancer Survivors (BCS). Nowadays, BCS do not only seek to remain free of disease, but there is a demand to do it preserving their quality of life. Therefore, there is a need to focus not only on the survival of the patients, but also on their long-term quality of life.

Evidence shows that BCS have the highest rates of lost disability-adjusted life years (DALYs) among all types of cancer [1]; being sexual dysfunction (SD) one of the main causes [3,4], being DALYs index a validated health status indicator that evaluates the impact of health interventions in the quality of life of patients. The World Health Organization (WHO) describes sexual health as a "positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence" [5]. A healthy sexual function includes sexual activity, free of pain and discomfort, as well as a sexual response with no psychological difficulty experiencing desire, arousal and orgasm [6].

According to Diagnostic and Statistical Manual of Mental Disorders (DSM)-V [7], women can be diagnosed of SD when having persistent symptoms (at least 6 months) that cause a marked personal disturbance and a serious impairment in their sexual lives. SD has been classified into

three categories, according to the symptoms experienced: arousal disorder or disfunction in female sexual interest, orgasmic disorder, and penetration disorder or genitopelvic pain. However, for this definition to be complete, it should be considered that SD extends beyond physical symptoms, having serious consequences regarding the psychological health of patients and their sexual quality of life.

The prevalence of SD in BC survivors oscillates between 40–80% [3,8–14], clearly higher compared to healthy women [13–15], and persisting over time, affecting the quality of life of patients through many years [13,14,16–20].

The main symptoms of SD reported by BC patients include difficulties in arousal or excitation [8,10,14,21–25], decreased sexual desire [8–10,14,21,23,25–27], insufficient lubrication [3,8–10,14,21,23,25] and penetration pain [8,14,22–25].

Although being a frequent problem among BC patients, SD is not usually discussed in the clinical practice [16,28–32], since health care providers often feel uncomfortable asking sexual-related issues to patients [16,32–36] and furthermore, they do not always have received a proper formation on this field [14,16,32,34]. In addition, patients tend to feel embarrassed to discuss sexual concerns during BC related visits [16,37]. Some studies reflect that BCS feel that their health care providers are not properly prepared to treat SD issues [16,38]. As a result, sexual counselling is not usually provided to BC patients [16,28–32] and SD remains being an underdiagnosed and undertreated issue for these women [16,28–32].

Therefore, the aim of this review is to provide an updated view of how BCS sexual function can be retrained; evaluating how SD is assessed in BC survivors, which specific causes affect sexual function in BCS and potential therapeutic options to palliate SD in BCS.

2. Methods

Observational studies evaluating sexual dysfunction in BCS published until December 2021 were deemed eligible. No limits were set in terms of time of publication or study design. Both prospective and retrospective designs, as well as case series, were acceptable. Interventional studies (randomized-controlled trials (RCT), nonrandomized studies) assessing treatment options in these cohort were included too. Publications with available full text of the article in English language were deemed eligible.

Articles that evaluated non-gynecological cancers were excluded, as well as those focusing on the sexuality of men.

In December 2021, a search on Ovid Medline, Embase, PubMed, Cochrane register of controlled trials (CCTR), Cochrane database of systematic reviews (CDSR), CINAHL and Google scholar for all publications up to date was performed to identify potentially relevant publications related to sexual dysfunction in BC survivors. Search terms used were: “breast cancer”, “sexual health”, “breast cancer survivors”, “sexual dysfunction”, “sexuality”.

3. Results

3.1 Assessment of SD

According to current evidence, multiple scales have been used in the literature to assess the sexual functioning of patients, but there is no specific validated scale to evaluate SD in BC patients [28,39,40]. Despite some research groups have created and published new scales or adaptations from already existing ones, to evaluate sexual function in BCS.

Bartula and colleagues [41] have suggested an adaptation of Female Sexual Function Index (FSFI), named FSFI-BC; Mancha *et al*. [40] have designed the Sexual Satisfaction Questionnaire (SEXAT-Q), and Jeng *et al*. [39] have developed a scale-integrated questionnaire for this purpose. However, to date, only the FSFI has been qualified as a validated scale [41].

A systematic review of the existing scales to evaluate SD, concluded that the most suitable scales to be used in BCS are Arizona Sexual Experience Scale (ASEX), Female Sexual Function Index (FSFI) and Sexual Problems Scale [28].

3.2 Specific Causes of SD in BC Patients

SD in BC survivors is a multifactorial entity severely influenced by the secondary effects of treatments of BC and the psychological impact of presenting the disease itself [4,10,14,25,32].

Specific cancer related causes of SD for BC survivors were found and divided in those related to locoregional strategies (surgery, radiotherapy), those related to systemic treatments (chemotherapy, endocrine therapy) and those related to sociocultural differences among patients.

(A) Surgery causes a direct disruption in the body image, especially among those women undergoing a mastectomy [9,11,14,25,28,32]. This alteration is magnified by the fact that breasts, apart from being one of the key erogenous parts of the female body, are considered to be symbols of sexuality and sexual identity [11,13,28,32,33].

Radiation therapy can also cause locoregional alterations in the breast, such as pain, discomfort, skin lesions or loss of flexibility.

(B) Chemotherapy sometimes leads to ovarian failure, asthenia and alopecia, among others.

Endocrine therapy is aimed to reduce the oestrogen levels of the organism, causing menopause-related symptoms among patients [4,8–11,14,16,25,30,32]. Genitourinary syndrome of menopause appears to be directly related to SD in BCS.

(C) Achieving sexual satisfaction for women does not rely exclusively on physical aspects, but also on psychological responses [32,41–45].

Table 1. Summarize of main causes of Sexual Dysfunction in Breast Cancer survivors.

Potential cause of SD		Mechanisms	Authors describing
Locorregional treatments	Surgery	Anatomic change of the breast	Panjari (2011)
		Disruption of the body image	Bartula (2013)
		Scaring	Sadovsky (2010)
		Pain	Gandhi (2019)
		Sensibility alterations	Hungr (2017)
			Boquiren (2016)
			Candy (2016)
	Radiation therapy	Skin lesions	Cobo (2018)
		Tissue discomfort	Boswell (2015)
		Sensibility alterations	Seav (2015)
		Pain	Panjari (2011)
			Sadovsky (2010)
			Ljungman (2018)
			Gandhi (2019)
			Hungr (2017)
			Boquiren (2016)
Systemic treatments	Chemotherapy	Tiredness and asthenia	Cobo (2018)
		Alopecia	Boswell (2015)
		Ovarian failure	Seav (2015)
		Decreased libido	Panjari (2011)
			Sadovsky (2010)
			Ljungman (2018)
			Gandhi (2019)
			Hungr (2017)
			Boquiren (2016)
			Candy (2016)
	Endocrine therapy	Hot flushes	Cobo (2018)
		Vaginal dryness	Boswell (2015)
		Penetration pain	Seav (2015)
		Vulvovaginal atrophy	Panjari (2011)
		Decreased libido	Sadovsky (2010)
			Ljungman (2018)
			Gandhi (2019)
			Hungr (2017)
			Boquiren (2016)
Psychological aspects		Sexualization of the breasts	Bartula (2013)
		The breast as a symbol of feminity	Gandhi (2019)
		Social beauty standards	Langellier (1998)
			Hungr (2017)
			Boquiren (2016)

SD, Sexual Dysfunction.

Evidence shows that mental health status is poorer in women experiencing SD [13,14,21]. SD also causes patients to feel body shame, and to feel unattractive and undesired by their partners, as well as a feeling of rejection by those [14,19,21,45]. Additionally, there have been reported changes in the sense of sexual self [14,15,21,22].

Both BC diagnosis and SD could act as potential stressors for women, causing an impairment in their global health status and even a negative impact on the effect of BC treatments and the progression of the disease [46]. The fact of suffering a BC itself can cause mental health disruptions, such as depression, anxiety or emotional distress [11,13,14,21,30].

BCS partners can also be affected by SD. Partners can change their attitudes during sexual practice to avoid causing any physical harm to women [14,45], presenting SD.

The potential causes of SD in BC survivors are summarized in Table 1.

3.3 Treatment Options

Nowadays, various treatments have been suggested to manage SD in BCS. However, a standardized treatment

has still not been established to specifically address SD in BC survivors. Broadly speaking, the treatments available can be classified into four categories: local treatments, systemic treatments, physical therapies and educational interventions.

3.3.1 Local Strategies

Local treatments include vaginal-application products, such as moisturizers and lubricants, aimed to reduce the symptoms of SD. The products assessed are: polycarbopyl-based moisturizer [47–51], compounded testosterone cream [4,52,53], pH balanced lactic acid gel [4,54] and vaginal oestrogens [27,55–58]. The effects of each of these products are summarised in Table 2.

Evidence shows that some symptoms of SD improve with local treatments, especially intercourse pain and vaginal dryness. Regarding the use of vaginal oestrogens, even though they have shown to improve the sexual function more effectively than moisturizers, they have also proven to have systemic absorption [59].

Moreover, evidence from studies in healthy women and women with sexual dysfunction for other causes shows that vaginal vibrator use improves various aspects of the sexual function of patients, especially desire, arousal, lubrication, orgasm, and pain [60–62] and, it has been proved to be a useful treatment tool for anorgasmia [60,63–65]. The use of a vaginal vibrator is also effective improving genitopelvic pain and dyspareunia [60,62,66–68]. Despite the potential use of vibrator therapy as a treatment of SD, there are still no studies in BC patients to date.

3.3.2 Systemic Pharmacological Treatments

Transdermic testosterone and antidepressants like venlafaxine, clonidine and bupropion are the systemic treatments tested to address SD symptoms in BC patients. However, none of these treatment options have shown to be superior to placebo improving SD [53,69,70].

3.3.3 Physical Therapy

The effect of different modalities of physical therapy has been tested in three clinical trials. There have been evaluated the effects of a home-exercise program [71], a one-year strength training [72] and general physical training [73] on the symptoms of SD. Only body image has shown to improve after a one-year strength training program. Slight improvements of sexual health have been shown when combining physical activity with cognitive therapy [71]. Also, a discrete improvement in the perception of one's appearance and sexuality are described with a one-year strength training [72].

3.3.4 Educational and Psychotherapeutic Interventions

Some studies have evaluated the use of educational strategies and counselling as a treatment of SD in BC survivors, understanding as sexual counselling the provide of sexuality information during medical visits and targeted psychological sexual therapies undergone by specific formed professionals in the field.

Evidence shows SD improves after educational interventions specifically focused on sexual aspects related to BC [74–78]. Couple sexual therapy enhancing the communication of SD aspects and cancer, has showed improvement of SD as well [79,80].

Accordingly, SD appear to be not improved when psychological interventions are not focussed on sexual concerns [81–84].

4. Discussion

New challenges regarding BCS are appearing since the survival have increased drastically during the last decades. There is a huge demand from BCS to focus on maintaining quality of life and avoid secondary effects related to the provided treatments, such as SD.

Evidence shows that over half of BCS experience SD at some point during the treatment or posttreatment. Sexual Dysfunction in BCS present not only a high prevalence, but also a high degree of under-diagnostic in the clinical practice. Sexuality is not usually evaluated during oncological visits, therefore, a great number of women who suffer SD are not diagnosed and thus, not treated.

Patients need to be informed about secondary effects of BC treatments and its possible impact on sexuality. This topic should be easily and openly discussed during visits, and patients may be offered solutions in case they need help or further information.

The authors believe sexual disfunction should be evaluated systematically to all BCS and if possible in the near term, through a validated scale for BCS.

The importance of having a specific scale for BC patients relies on the fact that BC may affect the sexual life of women in a different way from other cancers. Since BCS are usually treated using antiestrogenic treatments worsening all menopause dimension symptoms, and directly causing a physical alteration in women in a sexuality-social-related organ [28,39].

An ideal scale would need to include all the dimensions of SD. It should also assess other aspects of sexuality beyond physical symptoms and include psychological aspects of sexual function, understanding sexuality from a holistic point of view, not focusing exclusively on coital relationships and vaginal intercourse. Finally, the scale would need to be brief and practical to complete, as well as offer the possibility to be repeated in different visits in order to evaluate the effectiveness of the treatment or strategies used.

Sexual Dysfunction in BCS needs to be understood as the result of the combination of multiple factors: BC is a disease that affects the breasts, which play an essential role in female sexuality and sexual activities, provoking serious impact on the mental health of BC patients and being a

Table 2. Summarize of main treatments of Sexual Dysfunction in Breast Cancer survivors.

Category	Treatment	Products	Evidence	Authors
Local treatments	Vaginal moisturizers	Polycarbopyl-based moisturizer	Improvement of vaginal dryness, dyspareunia, sexual satisfaction and frequency	Loprinzi (1997) Biglia (2010) Gelfand (1994) Juraskova (2013)
		Compounded testosterone cream	Global improvement of sexual function and vaginal atrophy	Dahir (2014)
		pH balanced lactic acid gel (pH 4.0)	Improvement of vaginal dryness and dyspareunia 12–50% vaginal irritation	Lee (2011) Candy (2016)
	Vaginal oestrogens		Improvement of vaginal symptoms Better vaginal histology	Biglia (2010) Pfeiler (2011)
			Systemic absorption	Kendall (2006) Donders (2014) Wills (2012)
Systemic treatments	Systemic androgens	Transdermal testosterone	No significant improvement of SD parameters	Barton (2007)
	Anti-depressants	Venlafaxine Clonidine Bupropion	No significant improvement of SD parameters	Buijs (2009) Nuñez (2013)
Physical therapy	One-year strength training		Improvements in body image perception	Speck (2010)
	Home exercise program General physical training		No significant improvement of SD parameters	Duijts (2011) Berglund (1994)
Educational and psychotherapeutic interventions	Interventions focused on sexual health		Improvements in sexual health parameters	Anderson (2015) Ganz (2000) Jun (2011) Kalaitzi (2007)
			Uncertain clinical relevance	Rowland (2009) Candy (2016)
	Interventions on general health		No significant improvement of SD parameters	Allen (2002) Salonen (2013) Greer (1992) Vos (2004)
	Couple therapy focused on sexual health in cancer patients		Improvements in SD parameters	Baucom (2009) Kalaitzi (2007) Christensen (1983) Candy (2016)

common cause of psychological disruption. This disruption has shown to be a constant reminder of the disease, causing women a feeling of insecurity regarding their health status [32]. Furthermore, many women report feeling unattractive and not desirable after BC [14,32], which is also affected by cultural aspects [32]. In addition, being aware of having SD and self-conscious during sexual activities, can also cause impairments on desire, arousal and difficulty to connect with the partner and enjoy the sexual relationships. All of these promote, in turn, SD [14,21,22,32,43,44].

Furthermore, cancer treatments (surgery, chemotherapy, radiation therapy, endocrine therapy) themselves also have a negative effect in the sexual life of women through physical symptoms such as fatigue, joint pain, penetration pain, lack of lubrication, decreased libido and difficulties in arousal.

Despite the high prevalence of SD and its consequences, there are still no clear standardized therapeutic strategies for these patients. Considering the multifactorial nature of SD and its impact on various aspects of the quality of life of patients, proper treatment options may result from the combination of pharmacological and psychological strategies.

The use of vaginal moisturizers combined with psychological therapy focused on sexual aspects should be considered. Moreover, including mechanical stimuli (vibrators, dilators) to the local treatment may be of benefit, although is still of no common use and should be potential investigation target for the future.

5. Conclusions

Sexual Dysfunction is a multifactorial condition that affects among 40–80% of BCS, causing a decrease in quality of life of these women.

Despite its prevalence, SD remains underdiagnosed and there is scare use of SD assessment scales in regular clinical practice. A regular implementation of a validated scale for its proper assessment would be benefitial for diagnosis screening.

Finally, there is no standardized therapeutic strategies to care for SD in BC survivors. Therapeutic options should be potential investigation targets for the near future, which may evaluate local treatments (vaginal moisturizers, vibrators) combined with psychological interventions.

Addressing this condition might suppose a step forward to achieve a healthy and satisfactory sexual life and, thus, higher quality of life of millions of women worldwide.

Author Contributions

EM and HC designed the current investigation. HC and IC performed the research. EM and HC wrote the manuscript. HC, EM, SA and CCB performed the editorial changes. All authors reviewed the final manuscript.

Ethics Approval and Consent to Participate

Not applicable.

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Conflict of Interest

The authors declare no conflict of interest. CCB is serving as one of the Editorial Board and Guest Editors of this journal. We declare that CCB had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to MAMZ.

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