Chapter 11
Disorders of Female Orgasm

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Keywords Orgasm • Anorgasmia • SSRI medications • Sex therapy

Introduction

Both cancer and cancer treatments can have deleterious effects on women's ability to attain orgasm. The degree to which sexual functioning at large is impacted depends on a number of medical, psychological, and social factors including severity of the disease, treatment intensity and length, emotional status during cancer diagnosis and management, access to social support, and comorbid psychological problems. In this chapter, we discuss the diagnosis, prevalence, and treatment of female orgasmic disorder (FOD), with an emphasis, where possible, on how they pertain to women with current or past cancer. Orgasm is a fundamental component of sexual response in both men and women, and is affected frequently in humans from the studies of cancer survivors.

A summary of the specific ways in which cancer and its treatment can impact orgasm and sexual functioning at large is also provided.

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Definitions of Female Orgasm Disorder

The *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision (DSM-IV-TR) [1], defines FOD as the persistent or recurrent delay in, or absence of, orgasm following a normal sexual excitement phase. In addition, the disturbance must cause marked distress or interpersonal difficulty. The diagnostic criteria also specify that the diagnosis of FOD should be based on the clinician's judgment that the woman's orgasmic capacity is less than that would be reasonable for her age, sexual experience, and the adequacy of sexual stimulation she receives.

It is important to note that the type or intensity of sexual stimulation required for obtaining orgasm varies widely across women. Orgasms have been reported to be induced by erotic stimulation of genital areas such as the breast/nipple, periurethral glans, or mons, in addition to the clitoris and vagina [2, 3]. Research indicates that stimulation via mental imagery, or fantasy, and hypnosis has been shown to induce orgasm [4, 5]. A few cases of spontaneous orgasm without an obvious source of sexual stimulation have been reported in the literature [6, 7]. Spontaneous orgasms have also been reported with the use of antidepressants [8–10].

The DSM-IV-TR subtypes are used to indicate the onset of orgasmic disturbance (lifelong vs. acquired), the context in which the disturbance occurs (generalized vs. situational), and whether the FOD is a result of psychological or combined factors. Most studies refer to orgasm problems in

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women as either *primary orgasmic dysfunction* or *secondary orgasmic dysfunction*. The term primary orgasmic dysfunction was introduced by Masters and Johnson [11] and has been used to describe women who report never having experienced orgasm under any circumstances, including masturbation. According to the DSM-IV-TR, this would refer to those women who meet criteria for lifelong and generalized FOD. Secondary orgasmic dysfunction relates to women who meet criteria for acquired and/or situational FOD.

Although situational FOD is understood to mean that orgasm difficulties occur in specific contexts, the clinical consensus is that achieving orgasm during intercourse with manual stimulation but not with intercourse alone would not meet criteria for clinical diagnosis, unless clinically significant distress is present. The inability to achieve orgasm when one wishes may result in sexual distress or dissatisfaction in women, but this is not always the case. Some women meet criteria for FOD and do not perceive their anorgasmia or reduced orgasmic capability as a problem nor do they report experiencing significant distress [12, 13]. If the disorder does not cause the women marked distress or interpersonal difficulty, a DSM-IV-TR diagnosis of FOD is not given.

While lifelong, generalized FOD is a clear diagnosis covering all sexual situations, a diagnosis of secondary orgasmic dysfunction (acquired and/or situational FOD) encompasses a wide range of clinical presentations. Women who were initially orgasmic but later obtain orgasms infrequently and women who achieve orgasms in only certain contexts, with certain types of sexual activity or with certain partners are examples of the heterogeneity found with secondary FOD.

A large proportion of women who meet FOD diagnostic criteria also meet the criteria for female sexual arousal disorder [14–16]. DSM-IV-TR criteria explicitly state that the absence or delay in orgasm must follow a *normal* sexual excitement stage produced by adequate sexual stimulation. Thus, women with comorbid FSAD and FOD may indeed have orgasm difficulties when sexual arousal is achieved. If adequate sexual arousal is not achieved, the lack of orgasm is due to FSAD, not FOD. Basson et al. [17] suggested the following revised FOD definition in order to address the fact that a DSM-IV-TR diagnosis of FOD precludes one of female sexual arousal disorder, and also to highlight the need for adequate arousal preceding the anorgasmia: "despite the self-report of high sexual arousal/excitement, there is either lack of orgasm, markedly diminished intensity of orgasmic sensations, or marked delay of orgasm from any kind of stimulation."

The World Health Organization's *International Statistical Classification of Diseases and Related Health Problems*, 10th Revision, defines orgasm dysfunction in broader terms and without subtypes. According to the ICD-10, orgasmic dysfunction is an absence of, or markedly delayed, orgasm in which the individual has had no experience of an orgasm in any situation (similar to "lifelong" subtype in DSM-IV-TR) or developed the dysfunction after a period of relatively normal response (similar to "acquired" subtype), and must not be the result of prolonged abstinence from sexual activity. Other criteria include frequently occurring orgasm difficulties that keep the individual from participating in satisfactory sexual activity lasting for a period of at least 6 months.

The Prevalence of Female Orgasmic Disorder

Orgasm difficulties ranked as the second most frequently reported sexual problem after sexual desire difficulties based on the interviews of 1749 American women (aged 18–59) in the National Health and Social Life Survey [82]. Specifically, 25% reported a lack of orgasm in the past year for at least several months or more. This percentage is comparable to clinic-based data. Orgasmic problems were noted by 29% of women (aged 18–73) who attended an outpatient gynecologic clinic [16] and by 23% of women (aged 18–65+) attending a UK general practice clinic [18]. A recent study of attendees (aged 18–75) at several general practice clinics

revealed that 18% received an ICD-10 diagnosis of orgasmic dysfunction, 13% of which reported it was also a problem for them [13]. [82] found that the frequency of orgasm both with a partner and during masturbation was greater for older groups of women and lowest for women between 18 and 24 years of age. Age differences in orgasm frequency may be due to differences in sexual experience such that younger women tend to have less experience and fewer partners [19, 82]. As young women engage in more sexual experiences, they may become more familiar with their bodies and learn what is sexually pleasing for them, including how to achieve orgasm.

Evaluating the prevalence of orgasm dysfunction in cancer survivors is complicated by the diversity of psychological, medical, and social factors that contribute to sexual outcomes and by the fact that most studies report the impact on sexual functioning in general without specifically addressing orgasm dysfunction. Out of the population of women treated for breast and gynecologic cancers, one half experience long-term sexual dysfunction [20]. Breast cancer is the most common cancer diagnosed in women, but has a high patient survival rate – 75% live at least 5 years post-diagnosis [21]. In a study of breast cancer survivors 1–5 years after initial diagnosis, roughly half the survivors exhibited a decreased interest in sex while 30% reported a decrease in sexual activity overall [22]. Gynecological cancer is the third most common cancer diagnosed in women and inherently interferes with sexual functioning due to the location of the cancer [23]. Defined as cancer of the female reproductive tract, gynecological cancer can affect the cervix, endometrium, fallopian tubes, ovaries, uterus, and vagina [20]. Several studies have examined sexual dysfunction resulting from these cancers, but cross-study comparison has proved to be difficult as patients fall into different categories of diagnoses, stages, and treatments [22]. Despite this issue, sexual dysfunction is a serious issue for cancer survivors; in one study, 50% of women with gynecological cancer reported sexual problems as having a devastating impact on quality of life [24].

The Impact of Cancer on Women's Sexual Health

When a woman is diagnosed with cancer, the priority for medical professionals is to determine whether or not she will survive and what must be done to give her the best possible prognosis. When treating an oncological patient, the main focus is on the physical ailment; however, cancer is certainly more than skin deep. As they battle their ailments, patients often cope with a variety of side effects; many basic human processes are affected, and sexual functioning is particularly susceptible to complications.

In their book about sexuality and chronic illness, Schover and Jensen elucidate the relationship between the two by asserting that cancer and its associated treatments can affect all biological systems necessary for normal sexual function. Symptoms such as pain during intercourse can lead to an initial diagnosis, and concern about their sexual functioning can influence patients as they evaluate possible treatment options [25]. Although surgery, chemotherapy, and radiation eradicate cancer cells, patients must cope with side effects such as hair loss, nausea, vomiting, weight gain, and fatigue.

Sexual responses are also affected by treatment; for example, situations that would normally excite someone may not elicit the same effect because chemotherapy affects the chemicals of the brain for stimuli [26]. Other possible sexual side effects include genital pain, premature menopause, dyspareunia, vaginal dryness, and vaginal stenosis [22]. Patients may also face arousal problems due to decreased lubrication and reduced vaginal elasticity [27].

In addition to physical effects, patients may also suffer emotional trauma. Potentially losing one's life can induce feelings of anger, fear, anxiety, sadness, and guilt, while disfiguring surgeries can alter a patient's self-image as a sexual being and lead to a decrease in sexual interest and desire [28]. Patients recovering from cancer may face depression and adjustment disorder, which can negatively affect sexual functioning, and this can be further compounded through the administration of selective serotonin

reuptake inhibitors (SSRIs) as treatment. Studies have revealed that sexual dysfunction can be a side effect of SSRIs, so it may be difficult to determine what impacts the patient's sexuality: the cancer treatment or SSRI [29].

Relationship issues may also develop during a cancer diagnosis and therapy. Women may need to reduce their workload in order to fully recuperate, which can seriously strain a relationship as their domestic and wage-earning duties must be shouldered by their partners. High costs of medical care may also impose a financial burden on the couple, and decreased sexual activity as the woman recovers can create marital and sexual tension that further damages the couple's relationship [30]. Sexual rehabilitation may be required for the couple to return to their previous levels of intimacy.

Effects of Specific Cancer Treatments on Orgasm Function

Women with cancer often face issues with their sexual health as procedures designed to treat cancer, such as surgical procedures, radiation, chemotherapy, and hormone therapy, negatively impact sexual functioning and satisfaction. Combining two or more therapies can result in even greater sexual dysfunction via vaginal stenosis, known as the narrowing of the vagina accompanied with increased dryness, loss of elasticity, and scar tissue [31]. Undergoing pelvic surgery often results in changes to sexual functioning along with one's body image and self-esteem [32]. In one study, 66% of women treated with radical pelvic surgery continued to experience sexual problems more than 6 months after the surgery [33]. Although invasive surgeries such as hysterectomies may affect the autonomic nerves activated during sexual arousal, Thakar et al. [34] found that women receiving full hysterectomies did not differ from women who received partial hysterectomies on orgasm frequency, intercourse frequency, or sexual desire. When compared to healthy controls, women treated with radical pelvic surgery were found to have less sexual desire and decreased vaginal lubrication, but no differences in orgasmic function or dyspareunia at 12 months post-surgery [35].

Radiation therapy impacts orgasm function to a greater degree than does the pelvic surgery. Radiation can cause thickening and contraction of the skin in the vaginal canal, vaginal stenosis, and changes in texture leading to difficulties with vaginal penetration and genital sensitivity [32]. Radiation-induced injury to genital organs has been reported objectively [36] and subjectively by patients [37, 38] described in the cancer literature. Jensen et al. [39] noted that in a sample of 118 women with cervical or vaginal cancer, 67% reported never to occasionally experiencing orgasm 1 month after radiotherapy with little improvement at 1 year (62%). In addition, the relative risk of orgasm dysfunction was approximately 1.5 times greater for women with cancer compared to the control group.

Chemotherapy is particularly detrimental to orgasmic function. Head, face, or genital hair loss, a common side effect of chemotherapy, may impact the way a woman feels about her sexual attractiveness and self-esteem [32, 83]. Other side effects include fatigue and weight change [83]. Ovarian failure due to chemotherapy is considered to have a direct effect on sexual functioning; a decrease in estrogen levels, provided by the ovaries, is associated with decreased vaginal lubrication leading to difficulty with intercourse and other sexual activities [40, 83]. Young-McCaughan [41] reported that women who underwent chemotherapy were seven times more likely to report difficulty attaining orgasm than women not treated with chemotherapy. Results from an outpatient study of 50 Italian women emphasize the damaging effects of chemotherapy compared to other treatments [42]. Of the women who did not report sexual problems prior to breast cancer treatment, 26% reported sexual dysfunction after chemotherapy, much greater than the women treated with surgery or radiotherapy, 12 and 6% respectively [42].

Endocrine therapy is effective for several medical conditions (e.g., diabetes, hypothyroidism) and is commonly used for treating estrogen receptor positive breast cancer [32]. Selective

estrogen receptor modulators such as tamoxifen and raloxifene bind to the receptor sites within cancer cells not allowing the cell to divide. Other hormone treatments include aromatase inhibitors and GnRH agonists, which lower estrogen levels. One prospective study of women receiving different combinations of hormone therapy found that women reported minimal sexual side effects with the use of tomaxifen alone and significant sexual dysfunction with zoladex, a luteinizing hormone-releasing hormone agonist, compared to cancer patients not receiving endocrine therapy [43]. Generally, cancer patients tolerate endocrine treatment much better than other therapies, especially chemotherapy (e.g., [32]).

The Treatment of Female Orgasmic Disorder

Several therapeutic perspectives including psychoanalytic, cognitive-behavioral, pharmacological, and systems theories approaches have been applied to the treatment of anorgasmia. To our knowledge, there has been little research on the effectiveness of these interventions specifically among cancer survivors who experience orgasm difficulties. Cancer survivors face a number of psychological and physiological challenges that need to be considered when planning treatments for sexual concerns. Here we review the effectiveness of empirically validated treatments for orgasm difficulties. Where available, we include information on whether the treatment has been effective among cancer survivors.

Determining a course of treatment for sexual dysfunction in cancer patients requires additional research and investigation as sexuality issues are not frequently discussed during routine oncological care [84]. The addition of sexual health training for physicians and improved patient education detailing cancer's potential sexual side effects would ensure a more accurate prevalence assessment and hopefully break down communication barriers between patients and physicians.

Psychological Approaches (Table 11.1)

Directed Masturbation

For women with orgasm dysfunction, masturbation exercises may be beneficial in a number of ways. Focussing on nonsexual cues rather than sexually arousing cues has been shown to impair sexual response [44]. Masturbation can help guide a woman's attention toward pleasurable sexual sensations (i.e., erotic cues). In addition, solitary masturbation eliminates performance anxiety or discomfort with communicating with a partner, both of which may play role in a woman's orgasm difficulties. Moreover, having the ability to immediately adjust the type of stimulation and intensity according to what a woman prefers may be more effective than depending on her partner to touch her with appropriate stimulation.

For women with *primary* anorgasmia, directed masturbation is the most frequently prescribed treatment. This treatment program was initially developed by LoPiccolo and Lobitz [45] and other researchers have produced variations of directed masturbation such as bibliotherapy, individual, couples, and group therapy formats (e.g., [46]). The directed masturbation program consists of successive stages of guided masturbation to train a woman to locate and manually stimulate genital areas that bring her sexual pleasure. The first stages begin with a visual examination of her body, using a mirror and educational diagrams depicting female genital anatomy. After visual and manual identification of her genitals, she is instructed to explore those areas and note which genital areas are sensitive and elicit pleasure. Then she is instructed to apply targeted manual stimulation to these regions and to increase the intensity and duration until "something happens" or until discomfort arises. Aids such as topical lubricants, vibrators, and erotic materials can be incorporated into the exercises. Training on self-stimulation is directed toward the woman's achieving orgasm alone. Once she has accomplished this, her partner is included in the directed masturbation sessions. The addition of her partner's presence serves as desensitization to anxiety that she may have experienced up until this point. As the woman learns to experience sexual

Table 11.1 Studies for the psychological treatment of orgasm dysfunction

References	Design	*N*	Treatment	Conclusion	Level of evidence
Directed masturbation (DM) studies					
LoPiccolo and Lobitz [45]	Single group treatment study; 15 sessions	8 women with primary anorgasmia	Individual DM modeled after Masters and Johnson, combined with Kegel exercises	All subjects, orgasmic with masturbation, 75% coitally orgasmic; gains maintained at 6-month follow-up	Assessment method not specified
Barbach [49]	Single group treatment study; 10 sessions over 5 weeks	83 women with primary anorgasmia	DM in group therapy	92% of subjects orgasmic with masturbation	Anorgasmia defined as no orgasmic experience
Heinrich [50]	Randomized three-leg study with control condition; between 1 and 5 weeks in length	44 women with primary anorgasmia	DM in group therapy (10 sessions/5 weeks) vs. individual DM bibliotherapy (1 session) vs. wait list	Both DM treatments improve masturbatory and coital orgasmic function (with group therapy more effective); little to no improvement with wait list	Assessment method not specified
McMullen and Rosen [52]	Randomized three-leg study with control condition; 1 session weekly for 6 weeks	60 women with primary anorgasmia	DM with videotape modeling vs. DM with written instruction vs. wait list	No significant difference between DM conditions, but both more effective than wait list; gains maintained/improved at 1-year follow-up	Sexual function questionnaire, clinician interview, self-reports
Delehanty [51]	Randomized two-leg study with control condition; 10-week duration	28 preorgasmic women	DM and assertiveness training in group therapy for 10 weeks vs. wait list	82% of subjects achieved orgasmic success with treatment	Sexual function questionnaire, self-reports
Fitchen et al. [53]	*Randomized* three-leg study; 14 week duration	23 women with secondary anorgasmia	DM, sexual info, relaxation, Kegel exercises, sensate	No change in orgasm for all groups	Subjects orgasmic less than 25% of time

Fitchen et al. [53]	Randomized three-leg study; 14 week duration	23 women with secondary anorgasmia	DM, sexual info, relaxation, Kegel exercises, sensate focus, sexual communication training; done with couples vs. groups vs. minimal contact bibliotherapy	No change in orgasm for all groups	Subjects orgasmic less than 25% of time
Hurlbert and Apt [54]	Randomized two-leg study; four treatment sessions and four phone sessions	36 women with secondary anorgasmia	Individual coital alignment technique (CAT) vs. individual DM	CAT subjects improved more substantially in coital orgasmic function than DM subjects	Self-reports and sex diaries
No control outcome studies					
Masters and Johnson [11]	Single group treatment study	342 women with primary and secondary anorgasmia	Couple's therapy that included sex education, sensate focus, sex communication training, and in vivo systematic desensitation	Varying levels of improvement for all subjects; 1–2% relapse rate at 1-year follow-up	Assessment method not specified
Brotto et al. [27]	Single group treatment study; three sessions/6 weeks	26 women seeking treatment for acquired sexual desire and/or arousal concerns	Mindfulness-based psychoeducation (PED) in small groups (4–6 women)	Improvement in subjective feelings of wetness post-PED compared to baseline; beneficial effect on sexual desire and distress	Clinician assessment

arousal and orgasm openly in the company of her partner, anxiety accompanying sexual encounters lessens. In addition, the partner is able to observe how to stimulate the woman effectively.

Directed masturbation is highly effective and evidence to support this treatment is presented in the link between masturbation and orgasm ability. Kinsey et al. [47] reported that the average woman reached orgasm more frequently during masturbation than with intercourse (95 vs. 73% of the time). More recently, Laumann et al. [48] reported a strong relation between frequency of masturbation and orgasmic ability during masturbation. Women who masturbated one to six times per year reported less frequent orgasms (67%) than women who masturbated once a week or more (81%).

A number of outcome studies and case series reported directed masturbation is highly successful for treating primary anorgasmia. High rates have been reported for orgasm attainment through group directed masturbation, ranging from 82 to 100% of anorgasmic women [49–51]. Self-directed masturbation via text and video yielded lower rates, 47–65% [50, 52].

Few controlled studies have examined the effects of directed masturbation for treating secondary anorgasmia. Fitchen et al. [53] compared minimal therapist contact bibliography with several established techniques, including directed masturbation, relaxation exercises, Kegel exercises, sensate focus, and sexual communication training. Surprisingly, the authors found no change in orgasmic ability among 23 women with secondary anorgasmia. These findings may indicate that factors other than orienting oneself to her body sexually and focussing on pleasurable physical sensations may be at play. Hurlbert and Apt [54] compared the effectiveness of directed masturbation with coital alignment technique in 36 women with secondary anorgasmia. Coital alignment is a technique in which the woman assumes the supine position and the man positions himself up and forward on the women. Thirty-seven percent of the women and their spouses receiving instructions on coital alignment technique vs. 18% of those receiving directed masturbation reported substantial improvements (>50% increase) in orgasmic ability during intercourse, orgasmic strength, and an increase in the number of orgasms during sexual activity with their spouse after four 30-min sessions. The benefits of this technique result from the fact that clitoral contact and possibly paraurethral stimulation are maximized. The effectiveness of directed masturbation for the treatment of anorgasmia among cancer survivors has yet to be examined.

Anxiety Reduction Techniques

Barlow [44] theorized that when faced with a sexual situation, individuals with sexual dysfunction shift their focus of attention away from erotic cues and re-direct their attention toward nonerotic cues (e.g., performance anxiety). This may be particularly relevant for cancer survivors as their bodies can be changed physically through the treatment of cancer. During sexual situations, these women may begin to focus on body image concerns stemming from altered breast [55] or genital tissues [56]. Healthy women with orgasm dysfunction may experience anxiety and negative emotions such as performance concerns, embarrassment, or guilt. It is very likely that cancer patients might also experience negative effect regarding important issues such as mortality and loss of reproductive capability [28] that could result in orgasmic difficulties along with other sexual problems. Focussing on these and other anxieties and concerns could result in "spectatoring" or self-monitoring during sexual activity [11]. Spectatoring is thought to impede sexual functioning through cognitive interference, with cognitions being directed away from the sexual experience and leaving less cognitive resources for processing erotic and physiological arousal cues.

Two commonly prescribed anxiety reduction techniques for the treatment of FOD include systematic desensitization and sensate focus. Wolpe [57] developed systematic desensitization for the treatment of specific phobias. When applied to orgasmic dysfunction, the woman and the therapist create a fear hierarchy of anxiety-provoking stimuli which successively increases in the amount of anxiety the activity produces. The deep relaxation exercise training aids in replacing fear responses with a calm, relaxed state. When anxiety is reduced and a relaxed state

is achieved, the woman can progress to the next, more fearful task in the hierarchy. The procedure is first completed by imagining all the items on the hierarchy. Afterward, she restarts the fear hierarchy by engaging in the actual activities.

Sensate focus is a skills-based couples' therapy developed by Masters and Johnson [11] that, like directed masturbation, increases awareness of sexually pleasurable regions for each partner and emphasizes communication of each other's preferences and pleasurable experiences via a sequence of body-touching exercises. The first stage of sensate focus is to explore their partner's nonsexual body areas without the goal of sexual activity. Once the couple increases the practice of sexual touching without the pressure of intercourse and the woman can maintain a relaxed state, she can move toward more sexually oriented touching such as female-guided genital stimulation or penile stimulation and eventually intercourse. Sensate focus combines the hierarchical nature of systematic desensitization with in vivo desensitization in order to reduce anxiety associated with orgasm performance.

Many of the treatment outcome studies that assess the effectiveness of anxiety reducing techniques for FOD combine these techniques with other modalities such as directed masturbation, skills and communication training, bibliotherapy, Kegel exercises, or sexual education. With the current literature, it is difficult to ascertain the extent to which these anxiety-focussed modalities impact treatment outcomes. In addition, the variation in sample characteristics, such as demographics, sexual dysfunction severity, diagnoses, primary vs. secondary anorgasmia, therapist characteristics, and treatment setting and duration, provides additional heterogeneity when systematically comparing anxiety reduction techniques. Meston et al. [58] reviewed controlled studies and found that anxiety appears to play a small role in FOD and these techniques are most effective when women experience concurrent sexual anxiety. Cancer patients use relaxation techniques to reduce general anxieties [59]; it may be possible that sexually anxious individuals could benefit from such techniques. Sexual anxiety was found to be a key factor in sexual relationships of women after breast reconstruction surgery [60].

Other Techniques

Sex education has been an important component of sex therapy since the publication of Masters and Johnson's *Human Sexual Inadequacy* (1970). Particularly, education about genital anatomy and learning techniques to enhance sexual pleasure aid in gaining orgasmic capability. Several studies provide evidence for the effectiveness of sexual education for primary and secondary anorgasmia [61]. [27] examined the effects of a brief sex education intervention on sexual arousal concerns among women with early-stage gynecologic cancer. The sexual education was conducted over three 1-h sessions and included education on masturbation and orgasm attainment, marital satisfaction, mindfulness, and relaxation techniques. Among improvements in sexual function, orgasm frequency and satisfaction increased significantly after the intervention.

Kegel [62] proposed that conducting exercises that strengthen the pubococcygeous muscle could facilitate orgasm by increasing vascularity to the genitals. Treatment studies comparing therapies with and without Kegel exercises have not produced significant differences in the alleviation of orgasmic dysfunction. However, Kegel exercises may act to boost orgasmic ability by enhancing physical arousal via increasing vascularity in the pubococcygeous muscle and may help women to identify and focus on pleasurable genital feelings much in the same way as other genital stimulation techniques.

Pharmacological Approaches

A small number of placebo-controlled studies have examined the effectiveness of pharmacologic agents for treating FOD not induced by antidepressant medication. Sustained release bupropion failed to improve orgasm in nondepressed, antidepressant-free women ($n=20$) with orgasmic dysfunction as compared to placebo [63]. However, a small percentage of women (20%) experienced facilitated and/or more intense orgasm during bupropion treatment. Zajecka et al. [64] reported improvement in orgasm among depressed women

reporting sexual dysfunction, including orgasm difficulties, compared to baseline after 12 weeks of treatment with nefazodone. Studies on sildenafil for FOD show mixed results. In one study, 53 premenopausal women diagnosed with sexual arousal disorder received a randomized combination of three 4-week periods consisting of either sildenafil, or washout, or placebo [65]. Women reported improvements in sexual arousal and orgasm and increased frequency of sexual fantasies and intercourse with sildenafil [65]. These findings were replicated in premenopausal women with sexual arousal disorder and type I diabetes [66]. An in-laboratory study by Basson and Brotto [67], however, found that the administration of sildenafil (Viagra) among 34 postmenopausal estrogenized women did not improve sexual arousal or orgasm. Meston et al. [68] examined the effects of *Ginkgo biloba* in 68 sexually dysfunctional women. Women were randomly assigned to 8 weeks of *Ginkgo biloba* extract, sex therapy, placebo, or *Ginkgo biloba* combined with sex therapy. Long-term use of *Ginkgo biloba* alone did not have a significant impact on sexual functioning, though when combined with sex therapy, significant increases were noted for sexual desire and satisfaction compared to placebo. Sex therapy alone significantly increased orgasmic function.

Several studies have examined potential pharmacotherapies for treating FOD induced by medications such as SSRIs, antipsychotic, and antiepilepsy drugs. Drugs tested as antidotes include antiserotonergic agents, such as cyproheptadine, buspirone, mirtazapine, and granisetron; dopaminergic agents, such as amantadine, dextroamphetamine, bupropion, methylphenidate, and pemoline; adrenergic agents, such as yohimbine and ephedrine; cholinergic agents, such as bethanechol; and the selective phosphodiesterase type 5 inhibitors. Numerous case reports and open-label studies examining SSRI-induced anorgasmia report success in alleviating reduced orgasmic function with some of these agents. However, placebo-controlled studies generally have not shown differential effects across these active treatments and placebo (for review, see Meston et al. [58]).

Hormone manipulation for the treatment of sexual dysfunction among cancer survivors has primarily consisted of either estrogen or androgen therapy [32, 69]. Cancer treatments such as chemotherapy and hysterectomies may lead to impaired ovary function [85]. Ovarian failure results in decreased levels of androgens and estrogen which, in turn, can impair sexual functioning, particularly sexual arousal [70]. Much of the hormone replacement research is dedicated to the alleviation of menopausal symptoms, natural and chemotherapy-induced, which include changes in one's sexual function (for a review, see Hickey et al. [71]).

A case series conducted by [84] found that oral esterified estrogen with methyl-testosterone (known commonly as the testosterone patch) improved sexual desire and arousal in three women with a history of recent breast cancer, one of which reported an increase in orgasmic function. Although hormone treatment has been shown to be effective and well tolerated (e.g., [72, 73]), certain risks have been identified. Findings from the Women's Health Initiative conducted across 40 US clinical sites conservatively suggest that hormone therapy may be linked to increased risk of heart disease and stroke and that beginning hormone therapy closer to menopause decreases the risk of heart disease [73–75].

Complementary and alternative treatments are used by cancer patients primarily to alleviate symptoms and side effects due to the disease itself and conventional treatment. Several survey studies have found that usage rates range from 9 to 91% across a variety of cancer diagnoses [76–80]. Therapies include (1) physical interventions such as yoga, acupuncture, massage, and therapeutic touch, (2) mind–body methods including relaxation techniques, music therapy, and meditation, (3) dietary remedies such as herbs, homeopathy, specific diets, and vitamins, and (4) alternative medical systems including Chinese medicine and ayurveda, a traditional Indian medicine [59, 81]. Studies assessing the efficacy of these treatments have found that there are benefits to the patients regarding subjective reports of relief of side effects and increased coping ability [81], although the known effects of alternative treatments on sexual difficulties among cancer patients are limited (Table 11.2).

Table 11.2 *Studies for the* pharmacological treatment of orgasm dysfunction

References	Design	*N*	Drugs	Conclusion	Level of evidence
Antidepressants					
Michelson (2000)	Randomized, placebo-controlled; 4 weeks	57 women with fluoxetine-induced sexual difficulty	Amantadine (50, 100 mg), buspirone (20, 30 mg)	Improved orgasm with tx	Daily diary and

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Antidepressants					
Michelson (2000)	Randomized, placebo-controlled; 4 weeks	57 women with fluoxetine-induced sexual difficulty	Amantadine (50, 100 mg), buspirone (20, 30 mg); fluoxetine continued during tx	Improved orgasm with tx and placebo; no difference between tx vs. placebo	Daily diary and clinician interview
Modell et al. [63]	Single-blind, placebo-controlled; 12 weeks	20 nondepressed women reporting nonphysiological orgasmic difficulty	3-week bupropion-SR (150 mg), 3-week bupropion-SR (300 mg)	Significant improvement of satisfaction with orgasm intensity and overall sexual satisfaction beyond placebo	Sexual function questionnaire
Zajecka et al. [64]	Cognitive behavioral analysis system of psychotherapy, nefazodone, or combined for 12 weeks	431 women; 65% reported depression; 48% reported sexual dysfunction	Nefazodone (200–600 mg)	Nonsignificant improvement in orgasm with psychotherapy, nefazodone, and combination groups at 12 week compared to baseline	Sexual function questionnaire, physician-rated depression severity
Phosphodiesterase inhibitors					
Caruso et al. [65]	Double-blind, crossover; 12 weeks	51 premenopausal women with sexual arousal disorder	Sildenafil (25–50 mg)	25 and 50 mg sildenafil increased orgasm frequency, compared to placebo and baseline; placebo increased orgasm relative to baseline	Sexual function questionnaire at baseline and monthly
Basson et al. [17]	Randomized, double-blind, placebo-controlled; two sessions	34 oestrogenised postmenopausal women with acquired genital female sexual arousal disorder and impaired orgasm	Sildenafil (50 mg)	Reduced latency to orgasm for low vaginal pulse amplitude responders only	Genital arousal (vaginal pulse amplitude); orgasm latency (timed), and intensity (self-report)
Caruso et al. [66]	Double-blind, crossover, placebo-controlled; 16 weeks	32 premenopausal women with type 1 diabetes and seasonal affective disorder	Sildenafil (100 mg)	Increased clitoral blood flow and improved subjective sexual experience (arousal, orgasm, sexual enjoyment, dyspareunia) with sildenafil	Sexual function questionnaire

(continued)

Table 11.2 (continued)

References	Design	*N*	Drugs	Conclusion	Level of evidence
Alternative treatments					
Ito et al. [86]	Double-blind placebo-controlled; 4 weeks	77 women, 6 with previous sexual dysfunction	ArginMax herbal supplement (ginseng, gingko, damiana, L-arginine)	47% in ArginMax tx improved orgasm function at 4 weeks vs. 30% in placebo	Sexual function questionnaire
Michelson et al. [87]	Double-blind, randomized, parallel, placebo-controlled; 10 weeks	148 premenopausal women with fluoxetine-induced sexual dysfunction	Mirtazapine (15–30 mg), yohimbine (5.4–10.8 mg), olanzapine (2.5–5 mg)	No differences between tx and placebo in diary or self-report ratings of orgasm function	Daily diary, sexual function questionnaire, structured interview
Meston et al. [58]	Cross-over, double-blind, placebo-controlled; 8 weeks	19 women with SSRI-induced sexual dysfunction	Ephedrine (50 mg)	Significant increase in orgasmic ability compared to baseline, but not placebo	Sexual function questionnaire
Meston et al. [68]	Randomized, placebo-controlled; 8 weeks	167 sexually dysfunctional women	Gingko biloba extract (300 mg)	Short-term use increased genital arousal response; long-term sex therapy alone increased orgasm function	Genital arousal (vaginal pulse amplitude), clinical interview, sexual function questionnaire
Hormonal treatments					
Krychman et al. [84]	Open-label; case series	3 women with history of breast cancer	Testosterone, varied administration	Sexual satisfaction and desire improved for two of three women	Comprehensive sexual medicine evaluation

Conclusion

This chapter provided a summary of FOD, highlighting the prevalence of orgasm dysfunction among female cancer survivors. A cancer diagnosis can significantly impact a patient's sexuality as the cancer itself, and its treatment has a variety of physiological and psychological side effects. The array of therapies available to treat FOD offers women with cancer the opportunity to regain their sexual identities and capacity for response as they focus on achieving a high standard of health overall.

In order for female cancer survivors to gain access to these treatments, it is imperative that sexual oncology be incorporated into a patient's treatment regimen. In order to fully understand and effectively address orgasm concerns among this group, physicians must broaden their focus to all elements of their patients' well-being, which includes sexual fitness. Assessing sexual function at the time of diagnosis and throughout treatment will provide data that researchers can use to develop therapies more finely tailored to the patient's needs.

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