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Approach to sexual dysfunction in women with cancer

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ABSTRACT

Sexual dysfunction in female cancer patients remains under-diagnosed and under-treated. As sexual dysfunction is becoming an increasingly common side effect of cancer treatments, it is imperative for healthcare providers and especially gynecologic oncologists to include a comprehensive evaluation of sexual health as a routine part of the workup of such patients. Although most oncologists are not experienced in treating sexual dysfunctions, simple tools can be incorporated into clinical practice to improve the management of these conditions. In this review, we propose a practical approach to selecting proper treatment for sexual dysfunctions in female cancer patients. This includes three main steps: knowledge, diagnosis, and sexual counseling. Knowledge can be acquired through a specific updating about sexual issues in female cancers, and with a medical training in female sexual dysfunctions. Diagnosis requires a comprehensive history and physical examination. Sexual counseling is one of the most important interventions to consider and, in some cases, it may be the only intervention needed to help cancer patients tolerate their symptoms. Sexual counseling should be addressed by oncologists; however, select patients should be referred for qualified psychological or sexological interventions where appropriate. Finally, a multidisciplinary team approach may be the best way to address this challenging issue.

INTRODUCTION

Sexual health in female cancer patients is a marker of quality of life; however, it is rarely addressed by the treating physicians and should be assessed at each surveillance visit.¹ Even though most oncologists are not experienced in treating sexual dysfunction, simple tools may be incorporated in clinical practice to improve management of patients suffering from sexual dysfunction. Providing information about sexual consequences of surgery is not only an ethical and professional obligation, but it can also improve the self-image of patients, as well as their quality of life.¹ In addition to psychological interventions, evidence- and practice-based therapies may help in treating sexual dysfunctions in cancer patients.

The symptoms of the genitourinary syndrome of menopause are a common reason for sexual dysfunction among cancer patients, mostly in breast cancer survivors, and can adversely affect quality of life and sexual health.² Typically, gynecologic cancer survivors experience sexual morbidity as a result of their

treatment.³ A practical approach to selecting proper treatment of sexual dysfunction in female cancer patients includes three steps focused on knowledge, diagnosis, and dialog. Most importantly, physicians should be aware of this condition to properly address it, and an open discussion with the patient can not only identify the problem but, in most cases, can also at least partially treat it by relieving anxiety and dispelling myths. In short, patients with sexual dysfunction should be properly assessed and effectively treated.

IMPACT OF EDUCATION AND TRAINING

Breast Cancer

Breast cancer treatments are often diagnosed with reduced sexual response, including low sex drive, and poor arousal and sexual satisfaction.⁴ Among women with breast cancer, 68–70% experience at least one sexual dysfunction.⁵ Of the women who are still undergoing treatment, 64% have sexual dysfunction, while in women who have completed treatment this figure is 45%.⁵ Vulvo-vaginal atrophy occurs in many patients receiving endocrine therapy for breast cancer, particularly in those treated with aromatase inhibitors, due to estrogen depletion.⁶

The quality of the relationship between the woman and her partner is also an important factor for the sexual well-being of patients. Women whose partners adapt to the illness in a positive and supportive manner report better psychosocial outcomes related to sexuality.⁷ Sexual dysfunction in breast cancer patients is a complex and problematic issue that requires considerable organization and a multi-disciplinary approach to its management.⁸

BRCA Carriers

BRCA 1/2 mutation carriers often undergo prophylactic removal of their ovaries and fallopian tubes by 35 years of age or on completion of childbearing.⁹ This means that these patients will experience surgical menopause with abrupt and severe sexual side effects such as vaginal dryness and irritation, pain with penetration, decreased arousal, and loss of desire. In addition, those undergoing prophylactic bilateral mastectomy may also experience loss of skin and nipple sensation, scars, and changes in self-image.⁸

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Loss of sexual function is one of the most common reasons for BRCA mutation carriers to reject prophylactic surgery. It has been proposed that if women believe that these issues can be effectively addressed by available treatments, this will certainly increase acceptance of this potentially life-saving procedure.⁸

Gynecological Cancers

Gynecological cancer survivors experience more frequent sexual problems than women in the general population. Survivors of gynecological cancers tend to suffer from sexual problems regardless of cancer site, treatment type, and time from diagnosis, with problems that do not improve over time and, in fact, worsen. Commonly performed procedures for treatment of gynecological cancer such as vulvectomy or hysterectomy may lead to pain, loss of sensation, changes in body image, vaginal dryness, and difficulty in reaching orgasm. Bilateral salpingo-oophorectomy in a pre-menopausal woman leads to premature menopause, resulting in menopausal symptoms such as hot flashes, changes in mood, and sleep disturbances. The abrupt or premature onset of menopause may lead to other symptoms including vaginal dryness, dyspareunia, and decreased libido. Women treated with radiation, chemotherapy, or both, in addition to surgery, have an increased risk of developing more severe sexual dysfunction.⁸ Radiation therapy causes fibrosis in the vaginal connective tissue, which may result in inelasticity and pain during intercourse.

Vulvar Cancer

Surgical treatment for vulvar cancer or vulvar intra-epithelial neoplasia is associated with a high risk of developing sexual dysfunction, dissatisfaction with partner relationship, and psychological difficulties. Factors associated with higher risk of post-treatment sexual dysfunction include increased age, poor overall well-being, history of depression, anxiety, excision size of vulvar malignancy, stenosis, and radiotherapy effects.¹⁰

In addition to vulvar surgery, systemic and, to a greater extent, local radiation therapies lead to tissue stiffening and further vaginal stenosis.

Cervical Cancer

When compared with healthy controls, significantly more cervical cancer patients reported sexual dysfunctions, including sexual arousal dysfunction, entry dyspareunia, deep dyspareunia, abdominal pain during intercourse, and reduced intensity of the orgasm, mostly after radiotherapy and especially if they had undergone brachytherapy, and both before and after surgery.¹¹ In addition, cervical cancer patients reported worse psychological functioning before surgery and at 6 months after surgery. Systemic radiotherapy and dominantly brachytherapy, used in locally advanced cervical cancer, lead to a severe form of elasticity loss and pain during sexual intercourse.

Endometrial Cancer

Patients with endometrial cancer are at increased risk for sexual dysfunction, both before and after surgical treatment. The results of a recent study of endometrial cancer survivors showed that 68.6% of the patients had sexual dysfunction, and that 55.9% of the patients never had sexual intercourse with their partners after surgery.¹²

In comparison with women with a benign gynecological condition, significantly more endometrial cancer patients reported entry dyspareunia 1 year after surgery. Moreover, compared with healthy women, more endometrial cancer patients reported sexual dysfunctions, including sexual desire dysfunction, arousal dysfunction, and a reduced intensity of orgasm, both before and after surgery, mostly if they had undergone pelvic radiotherapy.¹³

Ovarian Cancer

Compared with healthy controls, ovarian cancer survivors report increased vaginal dryness, more dyspareunia, less sexual activity, and lower libido, as well as significantly higher levels of discomfort and decreased pleasure with sexual activity.^{3,14} A recent study revealed that >50% of ovarian cancer patients reported decreased libido and lack of desire to initiate intercourse, compared with 25% of healthy controls; however, both groups placed similar value on the importance of sexual activity, highlighting the need for appropriate interventions to enable ovarian cancer survivors to maintain a satisfactory sexual function.¹⁴ More recently, a study evaluating the effects of a brief psychoeducational intervention, in women undergoing treatment for ovarian cancer, showed significant improvements in overall sexual functioning and psychological distress that were maintained at the 6-month follow-up.¹⁵

DIAGNOSIS AND EVALUATION

Identification of patients suffering from sexual health issues should include information about sexual function before cancer, current sexual activity, and how cancer treatment has affected sexual life and the intimate relationship with their partner.³ Discussions between patients and their providers is often the most important intervention. Only select patients need to be referred to a sexual health counselor. Criteria for psychosexual referral are: sexual dysfunction that creates strong personal or partner distress; counseling by treating physician not sufficient or superficial because of lack of time, treatment failures or presence of personal or relation problems.

The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)¹⁶ contains updated diagnostic criteria for female sexual dysfunction to reflect new theories about the female sexual response cycle. Female sexual dysfunction is classified into three categories, although there is often considerable overlap: female sexual interest/arousal disorder, female orgasmic disorder, and genito-pelvic pain/penetration disorder. In order to meet criteria for the diagnosis of female sexual dysfunction, symptoms must be present for at least 6 months and cause clinically significant distress.³ Definitions are presented in [Table 1](#).

A thorough, systematic physical examination is essential, and should include an evaluation of organic causes of sexual dysfunctions.¹ Sexual function problems in women are often physical or physiologic, and are frequently accompanied by physical findings such as atrophy, vulvar fissures, contact dermatitis, and decreased or absent breast sensation. In particular, the atrophy and thinning of the vulvo-vaginal mucosa is due to the loss of estrogen effects, especially in cases of treatment-induced menopause. Vaginal atrophy or restriction and reduced vaginal elasticity are common side effects of surgery, as well as long-term sequelae of chemotherapy and pelvic radiotherapy. In the case of breast cancer, the

Table 1 Classification of female sexual dysfunction according to the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)^{18 *}

Female sexual interest/arousal disorder	Lack of, or significantly reduced, sexual interest or arousal as manifested by at least three of the following: (1) Absent or reduced interest in sexual activity; (2) Absent or reduced sexual/erotic thoughts or fantasies; (3) No or reduced initiation of sexual activity and unreceptive to partner's attempts to initiate; (4) Absent or reduced sexual excitement or pleasure during sexual activity in almost all or all (75–100%) sexual encounters; (5) Absent or reduced sexual interest or arousal in response to any internal or external sexual or erotic cues (eg, written, verbal, visual); (6) Absent or reduced genital or non-genital sensations during sexual activity in almost all or all (75–100%) sexual encounters.
Female orgasmic disorder	Presence of either of the following symptoms and experienced on almost all or all (75–100%) occasions of sexual activity (in identified situational contexts or, if generalized, in all contexts): (1) Marked delay in, marked infrequency of, or absence of orgasm; (2) Markedly reduced intensity of orgasmic sensations. In evaluating women reporting concerns achieving orgasm, it is important to inquire about adequacy, variety, and amount of stimulation during sexual activity.
Genito-pelvic pain/penetration disorder	Persistent or recurrent difficulties with one or more of the following: (1) Vaginal penetration during intercourse; (2) Marked vulvovaginal or pelvic pain during vaginal intercourse or penetration attempts; (3) Marked fear or anxiety about vulvovaginal or pelvic pain in anticipation of, during, or as a result of vaginal penetration; (4) Marked tensing or tightening of pelvic floor muscles during attempted vaginal penetration.

*Symptoms persist for a minimum of 6 months, cause clinically significant distress in the individual, are not better explained by a non-sexual mental disorder or a consequence of severe relationship distress or other significant stressors, and are not attributed to the effects of a substance or medication or other medical conditions.

anatomic changes resulting from surgery induce alterations in the perception of body image and, therefore, in self-esteem. The external and internal genitalia should be inspected for evidence of edema, scarring, stenosis, atrophy, urogenital prolapse, bowel or bladder incontinence, infection and other potential causes of discomfort. In particular, the objective assessment of vaginal health might be performed by using a Vaginal Health Index taking into consideration vaginal elasticity, fluid volume, epithelial integrity and moisture, and the simple and objective vaginal pH evaluation.¹⁷ The vulvar evaluation includes the diagnosis vulvar dystrophy and dysplasia and the use of a Q-tip test to localize vulvar pain.¹⁸

SEXUAL COUNSELING, PSYCHOEDUCATIONAL AND SEX EDUCATION INTERVENTION

Sexual counseling is the first and most important intervention to consider. Sometimes, it is the only intervention needed to help patients resolve or better tolerate symptoms.¹⁹ A guide to counseling is summarized in [Box 1](#). Gynecologists, gynecologic oncologists, and other health professionals who provide gynecologic care should be able to provide basic principles of sexual health advice

Box 1 Suggestions for sexual counseling for cancer patients (modified from Lindau et al¹⁸)

- Anticipate the potential effects of cancer and its treatments on sexual function
- Ask actively about sexual function concerns at each consultation
- Reassure the patient that sexual function concerns or problems are 'frequent', 'normal', and 'treatable'
- Arrange adequate time to focus specifically on sexual dysfunctions
- Provide written or web-based resources for further information
- Consider that sexual life is very complex and subjective
- Develop expertise to treat sexual problems
- Refer patients to specially trained professionals

and preventive interventions to preserve sexual function.¹⁸ Asking every patient about sexual symptoms opens discussion regarding pertinent sexual issues.²⁰ A simple screening question to assess sexual function, at least on an annual basis, is: "Do you have any sexual problems or concerns?". This simple, validated, routine screening item will signal to patients that sexual health issues fall within the scope of our practice as gynecologic oncologists.¹⁸

Eliciting a patient's sexual concern only works if the physician acts on her response. If a patient reports no sexual concerns, the suggested reply is: "You say that your sexual function is good. That's fine, but it's not uncommon to experience some changes in sexual function during or after cancer treatment. Let me know if anything comes up."¹⁸ If a patient indicates sexual function concerns, the clinician might consider a statement such as: "I see you have some difficulty with your sexual function. As many as 40–50% of women report changes or problems with sexual function during or after cancer. These problems are usually manageable and should improve over time."

The sexual side effects of chemo-radiotherapy should be discussed with the patients since the first counseling. The patient must sense the interest and willingness to discuss these matters by the caregiver and feel encouraged to talk, knowing that she will be heard.

To give information and open the dialog is important in every consultation. It is also important to dispel common myths about sexuality and cancer treatment. For example, patients and their partners should be reassured that there is no medical contra-indication to sexual intimacy during cancer therapy and afterwards.²¹

Sexual counseling is time consuming. If there is no proper time or place, it is better to reschedule the visit for a better time. While waiting to re-discuss the subject more extensively, one should offer the patient resources that she can use to preserve or improve her sexual function or knowledge. Education, the patient's partner, and sociocultural context influence the relationship between sexuality and health. Physicians, patients, and their partners should be aware

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of this in order to avoid thinking that there is a simple solution to every sexual problem. The Interactive Biopsychosocial Model (IBM) provides a conceptual framework for understanding the bidirectional relationship between health and sexuality throughout the life course.²² Training to learn more about the management and prevention of sexual problems in women with cancer is always recommended. Joining the Scientific Network on Female Sexual Health and Cancer at www.cancersexnetwork.org is encouraged.¹⁸

PSYCHOLOGICAL INTERVENTIONS

Psychoeducational or qualified psychological and sex education interventions are helpful to cancer survivors, and selected patients should be referred for such counseling. In a 6-week trial of psychoeducational intervention in breast cancer survivors, those randomized to the intervention group reported improvements in their relationship adjustment and communication as well as increased satisfaction with sex compared with controls, who received only written information.²³ Relaxation training and mindfulness-based interventions can help cancer survivors improve sexual function. A brief mindfulness-based cognitive behavioral intervention has been shown to be effective in improving sexual functioning (sexual desire, lubrication, orgasm, and satisfaction) in a group of gynecologic cancer survivors compared with controls.²⁴

TREATMENT

Systematic treatment of sexual dysfunction is important and treatments should be targeted. Analysis of the literature shows that there are no randomized, controlled trials to guide treatment of sexual dysfunction based on the type of cancer. Regarding hormonal therapies, a major distinction must be made between non-hormone-sensitive and hormone-sensitive tumors. In any case, systemic estrogen-progestin therapy should be carefully discussed on a case-by-case basis with an expert gynecologist-endocrinologist and an oncologist. However, all women presenting bothersome genitourinary symptoms and sexual dysfunctions should be educated and counseled about simple lifestyle changes: smoking cessation and weight control, limiting total intake of fats, and

promoting regular physical exercise. Regular sexual stimulation should also be encouraged, and underlying depression and distress should be investigated.²⁵

The first-line treatment to address vulvovaginal atrophy symptoms in cancer patients is the over-the-counter treatments consisting of non-hormonal vaginal moisturizers or lubricants. These non-hormonal water-based lubricants or polycarbophil moisturizers decrease symptoms of vaginal dryness and dyspareunia and have no effect on the loss of elasticity and compliance of vaginal walls. These treatments are particularly suggested for women with a history of hormone-dependent cancers or for patients undergoing adjuvant treatments when these are the only safe medical support. The counseling should require repeating the treatment over time and avoiding long phases without treatment. The use of local estrogen therapy is supported by the assessment of the efficacy of available intra-vaginal estrogenic preparations in all forms of preparations (creams, rings or tablets).²⁶ Vaginal estrogen therapy in women with a history of hormone-dependent cancer is controversial because of the theoretical increase of the risk of recurrence in case of systemic absorption of estrogens. Regulatory authorities and therapeutic experts from menopause societies agree that the minimum effective dose of estrogen should be used for the treatment of vaginal atrophy. However, data on ultra-low doses of local estrogen therapy are still under evaluation. In breast cancer survivors, the safety issue of local estrogens is still under discussion, as few studies have been conducted to address this question. The local use of certain estrogens, such as promestriene, does not significantly alter the systemic levels of estrone sulfate, and does not increase circulating estrogen levels.²⁷

Another recent option that could be proposed in women who are not candidates for local vaginal therapy is the new SERM (selective estrogen receptor modulator), ospemifene.²⁸ Ospemifene is a systemic treatment proven to have efficacy to treat local vulvovaginal atrophy.²⁹ In non-clinical studies, an antagonistic effect of ospemifene was observed on breast tissue. This suggests minimal risk of breast cancer after ospemifene exposure and ospemifene could therefore be considered an alternative treatment to vulvovaginal atrophy in breast cancer survivors who are currently not

Table 2 Available local and systemic treatment options in female cancer patient (elaborated upon by the authors)

Treatments	Breast cancer in treatment	Survivors of breast cancer	Cervical cancer	Endometrial cancer	Ovarian cancer
Over the counter treatment	Recommended	Recommended	Recommended	Recommended	Recommended
Local estrogen therapy	Not recommended	Might be suggested*†	Recommended	Might be suggested†	Recommended
Ultra-low local estrogen therapy	Might be an option*†	Might be suggested*†	Valid option	Might be an option*†	Valid option
Promestriene					
Ospemifene	Not recommended†	Recommended	Recommended	May be an option†	Recommended

*After careful counseling and discussion with the patient and the oncology team.

†Few data on the use of vaginal estrogens/ospemifene in women with gynecological hormone responsive cancers.

undergoing active/adjuvant treatment. Table 2 illustrates the available local and systemic treatment options in female cancer patient.

CONCLUSION

Considering the high survival rate of patients with cancer and the importance of sexuality for women across their lifespan, clinicians should devote a higher level of attention to sexual health and quality of life. As sexual dysfunction is becoming an increasingly common side effect of cancer treatments, it is imperative for healthcare providers and especially gynecologic oncologists to include a comprehensive evaluation of sexual health as a routine part of the workup of such patients from the first visit. By simply inquiring about sexual health issues, providers allow the patients an opportunity to discuss concerns openly, and can also dispel common myths regarding sexual health and sexual activity after cancer treatment. It is vital that healthcare providers educate themselves about the broad range of available treatment options. Moreover, resources to promote effective, sensitive communication with patients about sexual health issues need to be implemented. The development of an evidence-based psychosexual support programme should be based on a comprehensive characterization of sexual well-being, with special consideration of the unique and changing needs, values, and goals of individual women during and after cancer treatments. Finally, a multi-disciplinary approach might be the ideal strategy to provide the most comprehensive care.

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REFERENCES

- Del Pup L, Nappi RE, Biglia N, et al. Sexual dysfunction in gynecologic cancer patient. *WCRJ* 2017;4:e835.
- Portman DJ, Gass ML. Genitourinary syndrome of menopause: new terminology for vulvovaginal atrophy from the International Society for the Study of Women's Sexual Health and the North American Menopause Society. *Climacteric* 2014;17:557–63.
- Huffman LB, Hartenbach EM, Carter J, et al. Maintaining sexual health throughout gynecologic cancer survivorship: a comprehensive review and clinical guide. *Gynecol Oncol* 2016;140:359–68.
- Simon JA, Kokot-Kierepa M, Goldstein J, et al. Vaginal health in the United States: results from the Vaginal Health: Insights, Views & Attitudes survey. *Menopause* 2013;20:1043–8.
- Kedde H, van de Wiel HB, Weijmar Schultz WC, et al. Sexual dysfunction in young women with breast cancer. *Support Care Cancer* 2013;21:271–80.
- Biglia N, Bounous VE, Sgro LG, et al. Genitourinary syndrome of menopause in breast cancer survivors: are we facing new and safe hopes? *Clin Breast Cancer* 2015;15:413–20.
- Brusilovskiy E, Mitstifer M, Salzer MS. Perceived partner adaptation and psychosocial outcomes for newly diagnosed stage I and stage II breast cancer patients. *J Psychosoc Oncol* 2009;27:42–58.
- Sanchez Varela V, Zhou ES, Bober SL. Management of sexual problems in cancer patients and survivors. *Curr Probl Cancer* 2013;37:319–52.
- NIH Consensus conference. Ovarian cancer. Screening, treatment, and follow-up. NIH consensus development panel on ovarian cancer. *JAMA* 1995;273:491–7.
- Aerts L, Enzlin P, Vergote I, et al. Sexual, psychological, and relational functioning in women after surgical treatment for vulvar malignancy: a literature review. *J Sex Med* 2012;9:361–71.
- Aerts L, Enzlin P, Verhaeghe J, et al. Long-term sexual functioning in women after surgical treatment of cervical cancer stages IA to Ib: a prospective controlled study. *Int J Gynecol Cancer* 2014;24:1527–34.
- Gao H, Xiao M, Bai H, et al. Sexual function and quality of life among patients with endometrial cancer after surgery. *Int J Gynecol Cancer* 2017;27:608–12.
- Aerts L, Enzlin P, Verhaeghe J, et al. Sexual functioning in women after surgical treatment for endometrial cancer: a prospective controlled study. *J Sex Med* 2015;12:198–209.
- Whicker M, Black J, Altwerger G, et al. Management of sexuality, intimacy, and menopause symptoms in patients with ovarian cancer. *Am J Obstet Gynecol* 2017;217:395–403.
- Bober SL, Recklitis CJ, Michaud AL, et al. Improvement in sexual function after ovarian cancer: effects of sexual therapy and rehabilitation after treatment for ovarian cancer. *Cancer* 2018;124:176–82.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th edn. (DSM-5) - American Psychiatric Pub Inc, 2013.
- Nappi RE, Biglia N, Cagnacci A, et al. Diagnosis and management of symptoms associated with vulvovaginal atrophy: expert opinion on behalf of the Italian VVA study group. *Gynecological Endocrinology* 2016;32:602–6.
- Lindau ST, Abramssohn EM, Matthews AC. A manifesto on the preservation of sexual function in women and girls with cancer. *Am J Obstet Gynecol* 2015;213:166–74.
- Aubin S, Perez S. The clinician's toolbox: assessing the sexual impacts of cancer on adolescents and young adults with cancer (AYAC). *Sex Med* 2015;3:198–212.
- Cathcart-Rake EJ. Cancer in sexual and gender minority patients: are we addressing their needs? *Curr Oncol Rep* 2018;20:85.
- Cardoso F, Loibl S, Pagani O, et al. The European Society of Breast Cancer specialists recommendations for the management of young women with breast cancer. *Eur J Cancer* 2012;48:3355–77.
- Lindau ST, Laumann EO, Levinson W, et al. Synthesis of scientific disciplines in pursuit of health: the interactive biopsychosocial model. *Perspect Biol Med* 2003;46:S74–S86.
- Rowland JH, Meyerowitz BE, Crespi CM, et al. Addressing intimacy and partner communication after breast cancer: a randomized controlled group intervention. *Breast Cancer Res Treat* 2009;118:99–111.
- Brotto LA, Erskine Y, Carey M, et al. A brief mindfulness-based cognitive behavioral intervention improves sexual functioning versus wait-list control in women treated for gynecologic cancer. *Gynecol Oncol* 2012;125:320–5.
- Sousa MS, Peate M, Jarvis S, et al. A clinical guide to the management of genitourinary symptoms in breast cancer survivors on endocrine therapy. *Ther Adv Med Oncol* 2017;9:269–85.
- Suckling J, Lethaby A, Kennedy R. Local oestrogen for vaginal atrophy in postmenopausal women. *Cochrane Database Syst Rev* 2006;(4):CD001500.
- Del Pup L, Postruznik D, Corona G. Effect of one-month treatment with vaginal promestriene on serum estrone sulfate levels in cancer patients: a pilot study. *Maturitas* 2012;72:93–4.
- Nappi RE, Murina F, Perrone G, et al. Clinical profile of women with vulvar and vaginal atrophy who are not candidates for local vaginal estrogen therapy. *Minerva Ginecol* 2017;69:370–80.
- Del Pup L. Ospemifene: a safe treatment of vaginal atrophy. *Eur Rev Med Pharmacol Sci* 2016;20:3934–44.