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Review Article

Cervical Cancer Treatment and Its Effects on Sexual Function: Recent Evidence and Approach

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Abstract

The high curability of Cervical Cancer (CC), when detected early, combined with the latest scientific advances in the treatment of this disease, has contributed to greater survival of patients. However, its treatment can lead to significant late adverse effects, such as sexual dysfunction, significantly compromising quality of life. This study aims to conduct a systematic literature review on the effects of treatment for cervical cancer on sexual function. It is observed that sexual dysfunctions resulting from the treatment of the disease may include: decreased elasticity, mucosal atrophy, shortening, and stenosis of the vagina; reduced lubrication and reduction / loss of vaginal sensation; dyspareunia; reduced sexual desire and arousal; and anorgasmia. Despite growing evidence of sexual morbidity after treatment for cervical cancer, its proper assessment and management are still neglected in routine follow-up care. The need for a positive approach for patients to express their actual daily life situations is highlighted, emphasizing, in this regard, the specific assessment of sexual function, guidance with regard to resuming sexual activity after undergoing treatment, and the necessary interdisciplinary approach in the treatment of sexual dysfunction, when such a condition is identified.

Keywords: Uterine Cervical Neoplasms; Psychological Sexual Dysfunctions; Review Literature as a Topic

Abbreviations

CC: Cervical cancer; WHO: World Health Organization; CIS: Carcinoma *in situ*; QOL: Quality of life; SG: Surgery group; SCG: Surgery and chemotherapy group; SRG: Surgery and radiotherapy group; RT: Radical trachelectomy; RH: Radical hysterectomy; PFM: Pelvic floor muscles; HRQOL: Health-related quality of life; PFRP: Pelvic floor rehabilitation program

Introduction

A good sex life is an integral part of an individual's health and well-being, and is very important in a loving relationship [1]. According to the World Health Organization (WHO), sexuality is one of the indicators of quality of life; it influences thoughts, feelings, actions, social integration, and therefore, physical and mental health [2,3]. It is multi factorial and has a complex structure, influenced by biological, psychological, socioeconomic, intellectual, religious, and sociocultural factors, thus its practice depends on the integration of all these factors [4].

Gynecological cancer and its treatments can affect one or more phases of the sexual response cycle, through alterations of sexual function [5]. This is characterized by a disturbance in the processes that constitute the sexual response cycle, due to a lack, an excess, discomfort and/or pain in their expression and development [6].

The high curability of Cervical Cancer (CC), when detected early, combined with the latest scientific advances in medical treatment, has contributed to greater survival of patients [7-11]. However, treatment of this neoplasm can, on the other hand, lead to late adverse effects [11-14], primarily related to radiotherapy, caused by its action on healthy tissue and organs adjacent to the tumor. The area's most affected are the vagina, bowel/rectum, and bladder, which undergo changes in the mucosa, and may evolve into a series of changes and disorders, being primarily sexual, fecal, and urinary [11,12].

According to some authors, sexual dysfunction is the major source of suffering for patients after treatment for CC [15]. Golbasi and Erenel [1] state that female sexuality is more negatively affected by gynecological cancers, as compared with other types of cancers and chronic diseases, and the adverse physical and psychological effects tend to diminish with time, although the effects on sex life persist for a long time.

Among the main sexual dysfunctions resulting from CC treatment, the most notable are decreased elasticity, mucosal atrophy, shortening, and stenosis of the vagina; reduced lubrication and reduction/loss of vaginal sensation; dyspareunia; reduced sexual desire and arousal, anorgasmia, reduced frequency of sexual activity, and vaginal bleeding during or after intercourse [5,11,12,15-24].

There is seen, in clinical practice, an incipient and nonconsensual approach to sexual complications arising from treatment for cervical cancer, particularly with regard to sexual dysfunctions, which reinforces the need for reflection on the recommended workup and therapy in these circumstances.

This study aimed to perform a systematic literature review concerning the effects of treatment for cervical cancer on sexual

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function, intending to verify current knowledge available in the scientific literature on this subject, identifying the main instruments used to measure sexual function, as well as the main factors associated with it.

Methods

A literature review was conducted in the SciELO and PubMed databases, using the keywords "uterine cervical neoplasms" or "gynecological neoplasms", and "psychological sexual dysfunction". The search included only original articles related to humans, with an abstract and full text available, published between the years 2004 and 2012, in English or Portuguese that evaluated sexual function in women treated for gynecological cancer, and more specifically, for cervical cancer.

To select the studies, an initial reading of the retrieved abstracts was carried out, excluding literature review articles, or studies using only a qualitative methodology, or for the validation of instruments, or with a sample that did not contain women treated for cervical cancer. Subsequently, the articles that met the eligibility criteria for the study were accessed in full, and from these articles the following information was extracted for a compilation of the results: characteristics of the sample under study; comparison groups; instruments used; main findings and conclusions.

Among the articles selected, one was located in the SciELO bibliographic database, and 13 were located in the PubMed bibliographic database, totaling 14 articles, whose main results are summarized in Table 1.

Ethical Considerations

The study was approved by the Research Ethics Committee of the Federal University of Juiz de Fora, under opinion No. 131.805/2012.

Adverse effects of treatment for cervical cancer

Among the late treatment for cancer of the cervix adverse effects, the literature highlights: sexual, bowel or urinary dysfunction; early menopause and lower limb lymphedema [11,12,16,17,21,25,26]. With about 70% of cervical cancer survivors suffer from sexual dysfunction [12,22] like decreased vaginal sensitivity, reduced sexual desire and arousal and anorgasmia due to dryness, vaginal stenosis and bleeding, dyspareunia and vaginitis atrophic secondary to treatment [5,11,12,15-22,24].

Of the analyzed articles, Grover and colleagues [27] investigated the late effects of gynecological cancer treatment in a sample of 390 women. The average time since diagnosis was three years, and sexual dysfunction was the most frequently reported adverse effect for the sample studied. Among the women who had CC (23% of the sample - n=92), 79% reported sexual changes after treatment; 54%, cognitive alterations 38%, peripheral neuropathy; 47%, changes in irradiated skin; and 30%, intestinal alterations. According to the authors, the diversity of reported late effects emphasizes the need for comprehensive research covering all survivors of gynecological cancer.

In a Brazilian study [16], the sexual function of 71 patients diagnosed with locally advanced CC and treated exclusively with radiotherapy, with a post-treatment follow-up period between one and five years, was evaluated. Sexual dysfunction was verified in 3/4 of the patients, the main adverse effects of treatment being: vaginal fibrosis and stenosis (100 and 76.1%, respectively); decreased vaginal elasticity and depth (100 and 98.6%, respectively), and atrophy of the vaginal mucosa (71.8%). The results indicate sexual abstinence in 73.6% of the patients, which may be related to factors such as abandonment by partners, separation or divorce after the diagnosis or treatment of cancer, and the lack of medical guidance.

Impact of treatment on sexual function

Frumovitz and colleagues [28] investigated the impact of different CC treatment modalities on sexual function in 114 women in an early phase of the disease (stage I), who had undergone surgical treatment (radical hysterectomy and pelvic lymph node dissection) or radiotherapy, at least five years before, and women with no history of cancer (control group). It was found that patients who had undergone radiotherapy showed lower scores for sexual function compared to the surgery group and the control group. The authors concluded that radiotherapy has a negative impact on sexual function and that women who undergo surgical treatment have sexual function scores similar to those of women with no history of cancer, contrasting with the results obtained by Jensen and colleagues [29]. Such findings, however, agree with those from Cleary and Hegarty [5], supporting the view that, although all forms of treatment can have a negative impact on sexual function, treatment with radiation therapy usually leads to greater sexual dysfunction when compared to surgery and chemotherapy.

Donovan and colleagues [15] evaluated the sexual health of a group of patients (n=50) with CC in stage 0, I, or II, who underwent surgery and/or radiotherapy, between one and five years prior. The results showed that women with a history of cervical cancer have poorer sexual health, greater lack of sexual interest, less sexual satisfaction, and greater sexual dysfunction when compared to women with no history of cancer (control group). Patients who have undergone radiotherapy present significantly greater sexual dysfunction than patients having received surgical treatment only. The most consistent predictors of sexual health are: radiation therapy, time since diagnosis, partner relationship, self-perception of physical appearance, and vaginal changes. In contrast to previous studies, this research included, in its sample, patients with diagnosed Carcinoma *In Situ* (CIS), which could confound the results. Despite this, treatment with only a simple hysterectomy was not limited to women with CIS, and, in the statistical analysis, the stage of disease was not associated with the sexual health outcomes. This study thus verified the impact of radiotherapy on sexual function of survivors of CC, and points out other factors associated with sexual function that should therefore be the focus of intervention.

Park and colleagues [26] studied 860 women with a history of CC (stage: I to IV), with time since treatment ranging from 1.4 to 22 years, divided into subgroups: surgery (n=624), surgery and radiotherapy (n=101), and radiotherapy (n=135), with the three subgroups including patients that had received chemotherapy or had not. The outcomes of interest (QOL and sexual function) were compared between subgroups and with a control group of 494 women with no history of cancer, selected randomly. The women surviving CC have a poor body image, greater anxiety about sexual performance,

Table 1: Main characteristics of the selected articles on sexual function in women who have undergone treatment for gynecological cancer and, more specifically, cervical cancer, 2004 - 2012

Study	Study type	Instruments	Main results	Comments/Limitations
JENSEN et al., 2004	Prospective longitudinal study	*Sexual Function - Vaginal Changes Questionnaire*	Radical hysterectomy for cervical cancer treatment has a negative impact on sexual function, both short and long term.	Longitudinal study that used a validated questionnaire and included a large sample, homogeneous in relation to the stage and treatment of the disease. Despite not having conducted a sexual function assessment before treatment, it found the negative impact of surgery on sexual function.
FRUMOVITZ et al, 2005	Case-control study	SF-12[I] *Female Sexual Function Index*	Radiotherapy has a negative impact on sexual function, and women who had undergone surgical treatment had sexual function scores similar to women with no history of cancer.	A case-control study, which used a questionnaire with strong psychometric properties to assess and monitor sexual function among sexually active women who were cancer survivors, including cervical cancer ***. The results should be viewed with caution, since, as there was no prior assessment of sexual function, the observed association may not be causal in nature.
BERNARDO et al., 2007	Cross-sectional descriptive study	Structured questionnaire that addresses sexual complaints and dysfunctions, and gynecological physical examination #.	Overt sexual dysfunction in 3/4 of the patients after radiotherapy treatment for cervical cancer.	Since this is a cross-sectional study, we cannot say whether the findings are due solely to the treatment or to a combination of this with the dilemma of cancer. Furthermore, the sexual dysfunctions may be prior issues.
DONOVAN et al., 2007	Case-control study	*Sexual Function – Vaginal Changes Questionnaire*	Predictor variables of sexual health: radiotherapy, time since diagnosis, relationship with partner, self-perception of physical appearance, and vaginal changes.	Limitations: the small number of patients who underwent adjuvant radiotherapy, which makes it difficult to draw definitive conclusions regarding the effects of different treatment modalities on sexual health. Also, differences between the groups before treatment can not be disregarded.
LINDAU et al., 2007	Case-control study	Questionnaire consisting of questions comparable to the *National Health and Social Life Survey(1992)*[II]	Survivors' satisfaction with their sex life was significantly associated with self-perceived health and overall QOL *.	Sample was not restricted to patients with CC, including vaginal cancer as well. Results were compared to a population-based control group, however, there was no prior assessment of sexual function.
PARK et al., 2007	Case-control study	EORTC QLQ-C30[III] e QLQ-CX24[IV] Korean version of the *National Health and Social Life Survey*	CC survivors have a poor body image, greater anxiety about sexual performance, low sex drive and vaginal function, more frequent sexual concerns, lower extremity lymphedema, and greater symptoms of menopause than in the control group. Sexual problems strongly associated with QOL *.	Though the response rate of the survey was only 14.5%, it is a population-based case-control study. It had a very heterogeneous and representative sample that included all stages of the disease and a wide variation of time since treatment.
GREIMEL et al., 2009	Cross-sectional analytical study	EORTC QLQ-C30[III] e QLQ-Cx24[IV] *Sexual Activity Questionnaire*	Women treated with adjuvant radiotherapy are more prone to a poorer QOL in the long term and have lower levels of sexual activity.	Despite showing strong points such as a high response rate (80%), the heterogeneity of the sample in terms of age and time since diagnosis, and the use of validated instruments, an important limitation is the lack of available prior information regarding the sexual function and QOL of the participants. Therefore, possible prior differences between the study groups can not be ruled out.
LALOS; KJELLBERG; LALOS, 2009	Prospective longitudinal study	Information on socio-demographic characteristics, medical history, and urinary, climacteric, and sexual symptoms were collected by two questionnaires (before and after cervical cancer treatment)##	Most of the survivors reported reduced sexual desire, which was attributed to the treatment. Despite this, 82% were sexually active.	A longitudinal study with assessment before and one year after treatment. No urinary or climacteric changes were found, except in sexual function, which can be partly explained by the fact that no patient was treated with brachytherapy. Moreover, the majority of the women did estrogen hormone replacement one year after treatment, compared to the pre-treatment period, which may explain the limited number of climacteric symptoms one year after treatment, even for those who were ovariectomized.
CARTER et al., 2010	Prospective longitudinal study	FACT-G[V] e FACT-Cx[VI]; *Center for Epidemiological Studies Depression Scale*; *Impact of Event Scale*; *Female Sexual Function Index* and a medical information form.	Women who underwent radical trachelectomy or radical hysterectomy presented sexual dysfunction over the two years after treatment.	A longitudinal study with a pre-operative evaluation and five evaluations after treatment. Despite the small sample, the study shows that these patients, after radical hysterectomy or radical trachelectomy, deserve special attention with regard to sexuality.
RUTLEDGE et al., 2010	Case-control study	*Sandvik Incontinence Severity Index*; *Wexner Fecal Incontinence Scale*; Question number 35 from the *Epidemiology of Prolapse and Incontinence Questionnaire* and *Pelvic Organ Prolapse / Urinary Incontinence Sexual Questionnaire*.	Gynecological cancer survivors were less sexually active than those in the control group. They reported decreased sexual desire, decreased ability to achieve orgasm, and orgasms of lower intensity, lower arousal and sexual satisfaction, in addition to the presence of negative emotional reactions related to sexual activity.	A case-control study with a sample including various types of gynecological cancer. Although there were some important differences between the case group and the control group, such as age and menopausal status, these potential confounders were controlled via multivariate analysis.

GROVER et al., 2012	Cross-sectional descriptive study	Questionnaire containing questions about gastrointestinal and genito-urinary symptoms, sexual side effects, and general well-being and health.	The survivors of gynecological cancer have side effects from the treatment, especially in sexual function.	Although this is a descriptive cross-sectional study, it investigated late adverse effects from a large sample of gynecological CA survivors, separating the results by type of cancer, and demonstrating the high proportion of sexual dysfunction, which should be a focus of intervention in this population.
GOLBASI; ERENEL, 2012	Cross-sectional analytical study	*Sexual Quality of Life* (SQOL) – *Questionnaire – Female* and *Multidimensional Scale of Perceived Social Support* (MSPSS)	Gynecological cancer adversely affects the quality of sex life, regardless of the type of cancer, type of treatment, and the time since diagnosis.	Cross-sectional study that included various types of gynecological CA. The results should be viewed with caution, since the majority of the sample was in treatment at the time of evaluation, and there was no evaluation before treatment.
RODRIGUES et al., 2012	Case-control study	*Female Sexual Function Index*	Negative impact of pelvic radiotherapy on female sexual function in cancer survivors.	Besides gynecological CA, the study also included in its sample, rectal and anal CA. The results were compared to a control group. However, as there was no prior assessment, the observed association may not be of a causal nature.
YANG et al., 2012	Prospective, randomized and controlled experimental study	*Australian Pelvic Floor Questionnaire* EORTC QLQ-C30[III] e QLQ-CX24[IV]	Positive impact of physiotherapy intervention in sexual function scores, in the number of sexually active women, in the strength of the pelvic floor muscles, and in HRQOL ** of survivors of gynecological cancer.	Despite the small sample, allowed verification of a positive impact of the intervention studied, thus demonstrating the importance of including the physical therapist in the multidisciplinary team involved in caring for CC survivors.

[I]SF-12: abbreviated version of the SF-36 - *Medical Outcomes Study - 36-Item Short Form Survey*
[II]According to the DSM -IV-TR criteria (*Diagnostic and Statistical Manual of Mental Disorders)* and to clinical instruments for evaluation of female sexual dysfunction (e.g., *Female Sexual Function Index*)
[III]EORTC QLQ-C30: *The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30*
[IV] EORTC QLQ-CX24: *The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire -Cervical Cancer Module*
[V] FACT-G: *Functional Assessment of Cancer Therapy – General*
[VI] FACT-Cx: *Functional Assessment of Cancer Therapy – Cervix Cancer*
* QOL: Quality of Life
** HRQOL: Health-Related Quality of Life
*** Baser, Li and Carter (2012)
# Speculum exam with detailed observation of the vulva, vaginal opening, and the cervix, to measure vaginal depth, with Cheron forceps and a ruler, from the posterior fornix to the vaginal furcula
# # Instruments validated in a previous study (The Lalos, Lalos A. Urinary, climacteric, and sexual symptoms one year after treatment of endometrial and cervical cancer. Eur J Gynaecol Oncol. 1996; 17: 128–136

low sex drive and vaginal function, more frequent sexual concerns, lower extremity lymphedema, and greater symptoms of menopause, relative to the control group. Dyspareunia and perineal neuropathy are more evident in the women who underwent only radiotherapy. Multivariate analysis reveals an association between chemotherapy treatment and the presence of dyspareunia, insufficient lubrication, and sexual performance anxiety. The study also showed that the sexual problems presented by the CC survivors, such as a lack of interest in sex, dyspareunia, and especially, anxiety related to sexual performance, are highly associated with QOL. These results thus reinforce the findings of Lindau and colleagues [30] on the importance of sexual function for a woman's QOL.

Greimel and colleagues [31] investigated the late adverse effects of treatment on the QOL and sexual function in cervical cancer survivors. The study sample consisted of 121 women, divided into a surgery group (SG - n=63), a surgery and chemotherapy group (SCG - n=38), and a surgery and radiotherapy group (SRG - n=20). It was found that the SRG presented a QOL significantly worse in several domains, besides more problems of urinary frequency and incontinence, and a feeling of vaginal tightness. Regarding sexual function, the SRG group also presents a lower level of sexual activity, although there was no statistically significant difference in relation to sexual pleasure and discomfort among the three treatment groups. The study then concluded that the women treated with adjuvant radiotherapy are more prone to a worse QOL in the long term, and present lower levels of sexual activity.

A Portuguese study [32] evaluated the sexual function of 98 women who had undergone pelvic radiation therapy for treatment of CC (n=48), endometrial cancer (n=34), rectal (n=13), and anal (n=3) cancer, between three months and five years prior. The results were compared to a control group consisting of 101 women with no history of cancer. Sexual function is significantly worse in the cancer survivors, the most affected area being "desire." Sexual abstinence in the previous four weeks was also higher in this group, and the most common reasons were morbidity resulting from the cancer diagnosis and treatment (66.1%), and illness or physical limitation of the sexual partner (11.9%). The women who underwent radiotherapy show worse scores for sexual function overall, and in the domains "desire", "arousal", "lubrication", "orgasm", and "pain", when compared to the women who received combined treatment modalities. In addition, the study found that satisfaction with the relationship with friends and family, and with overall social support, is lower in the study group, and there was no difference between groups regarding satisfaction with the relationship with the partner [32]. Therefore, although the sample also comprised other types of cancer, these results support the studies by Bernard and colleagues [16]; Donovan and colleagues [15]; Greimel and colleagues [31]; and Frumovitz and colleagues [28], with regard to the negative impact of pelvic radiotherapy on sexual function in CC survivors.

Prospective investigation of sexual function

Aiming to assess the impact of surgery on sexual function, a Danish longitudinal study [29] was conducted with 173 women diagnosed with cervical cancer in the early stages who had undergone radical hysterectomy combined with pelvic lymphadenectomy. Sexual function was assessed at five weeks, and at three, six, 12,

and 24 months after surgery, with the results being compared to a population-based control group matched for age. It was found that, up to three months after treatment, the patients presented low or nonexistent sexual interest, dyspareunia, difficulty achieving orgasm, distress caused by reduced vaginal size, and dissatisfaction with appearance, with the proportion of women not sexually active being significantly higher compared to the control group. While in the long term, there is a persistent negative impact on the patient's sexual interest, and reduced vaginal lubrication during the first two years following the surgery. The patients reported less sexual interest and a higher level of sexual dissatisfaction in the first 12 months after treatment, compared to the time period prior to the diagnosis of cancer. In addition, approximately one third of the patients reported reduced sexual interest, lubrication, and vaginal size, likewise in comparison to the pre-diagnosis time period. However, most patients with active sexual life before cancer diagnosis remained after 12 months after surgery (91%), despite a significant reduction in the frequency of sexual activity after treatment. The study concluded that radical hysterectomy for the treatment of cervical cancer has a negative impact on sexual function, both short and long term, and that severe short-term sexual problems are attributable, in part, to the surgical trauma and to psychological and physical factors related to the still recent diagnosis of cancer [29]. A better understanding of the findings of this study could be reached by comparing these results with those observed in women who underwent hysterectomy for any benign condition.

In turn, Lalos, Kjellberg and Lalos [33] investigated, prospectively, the occurrence of urinary, climacteric, and sexual symptoms in 39 women with cervical cancer, before and one year after treatment. The results showed that there is a significant increase in the use of hormone therapy after treatment. Regarding sexual function, most of the women reported reduced sexual desire, which the interviewees attributed to the treatment. Although most of the women presented dyspareunia and reduced sexual desire, statistically higher one year after treatment, 82% had an active sex life, corroborating the study by Jensen and colleagues [29]. Thus It is seen that, despite having sexual dysfunctions, most of the women remain sexually active, which may be related to the pressure to satisfy the desires of the partner, since in societies where patriarchal ideology is highly present, the woman is expected to fulfill a socio-sexual role as wife, lover, and child bearer [34].

Carter and colleagues [35] prospectively evaluated the emotional, sexual, and QOL concerns of women who had cervical cancer in an early stage (IA - IB2) and who underwent Radical Trachelectomy (RT) or Radical Hysterectomy (RH), without adjuvant treatment. The assessments were conducted pre-operatively and 3, 6, 12, 18, and 24 months after surgery. Fifty-two women were included in the sample, of which 33 underwent RT and 19 underwent RH. The mood, distress, sexual function, and QOL scores did not differ significantly with respect to the type of surgery. Regarding sexual function, the results were unexpected, since the authors' initial hypothesis was that sexual performance would not be significantly impaired, as there was no adjuvant treatment, and ovarian function would remain intact in patients not undergoing oophorectomy. Furthermore, although both procedures are invasive, RT is more conservative, allowing preservation of the uterus, thus it was presumed that this group would present better sexual function. However, the mean scores, regardless of the type of surgical procedure, were below the cutoff of 26, indicating sexual dysfunction. It was subsequently found that most of the sample had sexual dysfunction throughout these two years, regardless of the type of surgery. Given these results, it is clear that even the patients undergoing more conservative treatments than hysterectomy, such as radical trachelectomy; deserve special attention with regard to sexuality.

Impact of social support on sexual function

Golbasi and Erenel [1] conducted a cross-sectional study designed with the objective of studying sexual QOL and associated factors in 80 married women. The major tumor types were: ovarian - 61.3%; endometrial - 22.5%; and cervical - 13.8%. Most of the women were diagnosed in the previous year (56.3%) and were still undergoing treatment for cancer (60%). Significant association was found between social support (dimensions and total score) and quality of sex life. The authors thus concluded that gynecological cancer adversely affects the quality of sex life, regardless of the type of cancer, type of treatment, and the time since diagnosis. Furthermore, it was found that social support, especially from the spouse, positively affects sexual QOL, reinforcing the importance of this support and of counseling by health professionals, for the women and their partners, about the disease and sexuality. These findings are in agreement with Fernandes and Kimura [36] who found that the presence of a companion contributes to greater comfort and emotional support to patients diagnosed with cervical cancer. Biffi and Mamede [37] also emphasize the sexual partner as one of the most important sources of social support in health care of women with cancer. In this regard, Fleury, Pantarolo and Abdo [38] state that through the consideration of sexual issues, the couple can develop acceptance and adaptation to changes caused by cancer and the sequelae of its treatment.

Medical approach to sexual function of survivors

In an American study [30], 160 long-term survivors of CC and vaginal cancer were evaluated, with a mean time since treatment of 25.8 years, and compared to a population-based control group (n=320). It was found that the survivors' satisfaction with sex life was significantly associated with self-perceived health and overall QOL. A significantly higher proportion of survivors reported that physical health always / almost always interferes in sexual activities, compared to the control group. Sexual problems are significantly more prevalent in the group of cancer survivors, the prevalence of dyspareunia and vaginal dryness are, respectively, about seven and three times higher among the survivors. These women are also more likely to have complex sexual morbidity and to report that they avoid engaging in sexual activity due to the sexual problems they are experiencing. Despite these results, 62% of the survivors reported that their physician had never discussed, during consultation, the effects of cancer and its treatment, on sexuality. It was also found that discussion with the doctor about the sexual effects of treatment is associated with lower sexual morbidity among the survivors, highlighting the importance of such communication with the patient. A comparison with a population-based control group reveals that the high prevalence and complexity of the sexual problems experienced by long-term survivors of vaginal and cervical cancer probably cannot be attributed solely to aging. The study does not describe the proportion of the two types of cancer in the study sample, and

whether there were differences in this respect. However, the findings highlight the importance of sexual satisfaction, which is associated with the patient's quality of life and of the medical approach to their sexuality in post-treatment follow-up care, regardless of the type of gynecological cancer.

Another study, among those selected, evaluated the prevalence of pelvic floor disorders and the sexual function of 260 survivors of gynecological cancer (the most common being: endometrial - 45%, ovarian - 29%, and cervical - 22%), and compared the results to a control group consisting of women with no prior or family history of cancer (n=108). The results showed that the women in the cancer group had significantly greater fecal incontinence and had a lower level of sexual activity compared to the control group. Moreover, they reported decreased sexual desire, decreased ability to achieve orgasm, and orgasms of lower intensity, lower sexual arousal and satisfaction, and the presence of negative emotional reactions related to sexual activity. However, no difference between the groups was found in relation to dyspareunia, thus reinforcing the multi factorial nature of sexual function. According to the authors, the sexual dysfunction findings may be associated with changes in body image and with hormonal function after treatment. Despite the high prevalence of pelvic floor disorders, fewer than half of the patients were asked by their oncologists about incontinence or sexual dysfunction during or after treatment [39].

This is in agreement with other studies, which also found that, although it is of utmost importance for QOL to discuss the patient's sexuality, there is neglect in this area by most health professionals in routine follow-up care after treatment [16,19,21,24,30,39]. In the study by Bernard and colleagues [16], 19.7% of the patients reported not receiving medical advice on the practice of sexual activity, which may, according to the authors, be a reflection of a fragmented view on the part of some medical staff involved in the treatment of cancer patients, focusing more on health-compromising aspects, such as the presence of residual tumor or recurrence, and treating as a lower priority the quality of life of the patient, of which sexuality is an important aspect.

Physiotherapeutic approach on sexual function

Yang and colleagues [40] carried out a prospective, randomized, controlled study to investigate the effects of a pelvic floor rehabilitation program on the function of Pelvic Floor Muscles (PFM), sexual function, and HRQOL in survivors of gynecological cancer (92.85% cervical cancer and 7.15% endometrial cancer). Thirty-four patients who underwent radical hysterectomy and pelvic lymphadenectomy, on average a year and three months before, were randomly distributed into two groups: an intervention group, which underwent a pelvic floor rehabilitation program - PFRP (n=17), and a control group (n=17) who received the usual care. The PFRP was conducted by an experienced physiotherapist and consisted of one exercise session (45 minutes) and one guidance session (30 minutes) per week, for four weeks. The control group received only the booklet of guidelines for doing exercises at home. Twenty-four patients (12 in each group) completed the exercise program. There were no significant differences in the measurements of PFM function and HRQOL between the intervention and control groups in the initial evaluation (T0). After PFRP (evaluation T1), the intervention group shows significant improvements in the scores for sexual function, in the number of sexually active women, in the strength of the PFM, and in HRQOL, overall and in several domains (physical and sexual function), compared to the control group. This demonstrated the positive impact of physiotherapy intervention on women who have undergone radical hysterectomy for the treatment of gynecological cancer. These findings are in agreement with Vidal [11], and Fitz and colleagues [25], according to whom, the treatment of sexual dysfunction in survivors of cervical cancer should be handled by a multidisciplinary team, it being important to include the physiotherapist.

Conclusion

Treatment for CC and, in general, for gynecological cancers, can have a negative impact on the sexual function of women who survive, especially radiotherapy treatment. Among the major sexual dysfunctions following treatment, the most prominent are vaginal stenosis/shortening and decreased lubrication, which in turn lead to dyspareunia and thus may interfere with the marital relationship, resulting in a negative impact, as well, on quality of life for these women.

Regarding the approach to these complications, some studies claim that the combination of topical estrogen with vaginal dilators, moisturizers, and lubricants is very beneficial in the management of the main sexual dysfunctions presented by CC survivors, such as vaginal dryness and stenosis, which in turn cause dyspareunia [17,20,41]. Besides vaginal dilators, stenosis can also be prevented through regular sexual intercourse, which acts in stretching the vagina and undoing adhesions [41]. The physical therapy approach should always be encouraged when it is seen that the recommended post-treatment dilation exercise is not showing effective results, and when vaginal stenosis is detected in the pelvic examination, especially in the first year of follow-up when reversal is still possible [11].

It is shown, therefore, that the sexual function of patients affected by cervical cancer calls for concern and attention, since it has an impact on the QOL of these women and their partners, which may negatively affect the couple's relationship, often resulting in sexual dissatisfaction, marital difficulties, and even abandonment of the women by their husbands, thus adding an increased overall burden of cancer on these women and their families [5,16]. In this regard, it is noteworthy that patients, in general, do not express their concerns about sexuality, leaving it to the professional to take the initiative to ask [23,24]. Thus it is up to the health professional to provide, during consultations, a favorable environment and encourage patients to express their actual sex life situations [11].

However, the assessment and management of sexual dysfunctions still remain neglected in routine follow ups. Thus, emphasis should placed on the need for a broader discussion about sexuality, so as to involve the general population, making it possible to break taboos and better clarify rights relating to the enjoyment of female sexuality. Furthermore, we stress the extreme importance of the assessment of sexual function, the guidance regarding the resumption of sexual activity after treatment, and the multi and interdisciplinary approach in the treatment of sexual dysfunction after treatment for cervical cancer.

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