Original Article

Investigation of the Effect of Adjuvant Endocrine Treatment on Depression, Sleep Quality and Sexual Function in Hormone Receptor-Positive Early-Stage Breast Cancer

Hormon Reseptör Pozitif Erken Evre Meme Kanserinde Adjuvan Hormonal Tedavinin Depresyon, Uyku Kalitesi ve Cinsel Fonksiyon Üzerine Etkinliğinin Araştırılması

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ABSTRACT

Aim: Questioning and recognizing depression, sleep and sexual dysfunctions in breast cancer patients improves the patients' quality of life. We aimed to evaluate the effects of adjuvant endocrine treatment and other variables on depression, sleep quality and sexual dysfunction in patients with early-stage breast cancer.

Materials and Methods: Our study was performed with the participation of 105 patients who were diagnosed with hormone receptor positive, early stage (stage I-III) breast cancer and at least 3 months followed by the medical oncology outpatient clinic. Sociodemographic form, Beck Depression Inventory (BDI), Pittsburgh Sleep Quality Index (PSQI) and Female Sexual Function Index (FSFI) were used as data collection tools.

Results: According to the results obtained in our study, 55.8% patients had depression, 60.6% patients had poor sleep quality, 77.1% had poor sexual function. A tendency to sexual dysfunction was observed in patients with PR positivity and it was found to be statistically significant (P=0.005). There was a strong ($p<0.001$) correlation between the PSQI and BDI values of the patients. There was no significant relationship between different endocrine therapy agents (tamoxifen/anastrozole/letrozole) in patients with depression, sleep and sexual dysfunction ($p> 0.05$).

Conclusion: In our study, we found a tendency to depression, sleep disturbance, and sexual dysfunction in most patients. It was found that sleep disorders and sexual dysfunction increased in patients with depression. It was also statistically significant that hormone receptor status could affect sexual function. Therefore, symptoms related to depression, sleep and sexual problems should be questioned in patients followed up with a diagnosis of breast cancer.

Key Words: Breast cancer, endocrine treatment, BDI, PSQI, FSFI

ÖZET

Giriş ve Amaç: Meme kanseri hastalarında depresyon, uyku ve cinsel işlev bozukluklarını sorgulamak ve tanımak hastaların yaşam kalitesini iyileştirmektedir. Erken evre meme kanserli hastalarda adjuvan endokrin tedavisi ve diğer değişkenlerin depresyon, uyku kalitesi ve cinsel işlev bozukluğu üzerine etkilerini değerlendirmeyi amaçladık.

Yöntem ve Gereçler: Çalışmamız, hormon reseptörü pozitif, erken evre (evre I-III) meme kanseri tanısı almış ve medikal onkoloji polikliniğinde en az 3 ay takip edilen 105 hastanın katılımıyla gerçekleştirildi. Veri toplama aracı olarak sosyodemografik form, Beck Depresyon Envanteri (BDI), Pittsburgh Uyku Kalitesi İndeksi (PSQI) ve Kadın Cinsel İşlev İndeksi (FSFI) kullanıldı.

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Bulgular: Çalışmamızda elde ettiğimiz sonuçlara göre hastaların %55.8'inde depresyon, %60,6'sında kötü uyku kalitesi, %77.1'inde cinsel işlev bozukluğu saptandı. PR pozitif olan hastalarda cinsel işlev bozukluğuna eğilim gözlendi ve istatistiksel olarak anlamlı bulundu (P=0,005). Hastaların PUKİ ve BDI değerleri arasında güçlü (p<0,001) bir korelasyon vardı. Depresyon, uyku ve cinsel işlev bozukluğu olan hastalarda farklı endokrin tedavi ajanları (tamoksifen/anastrozol/letrozol) arasında ise anlamlı bir ilişki yoktu (p> 0.05).
Tartışma ve Sonuç: Çalışmamızda çoğu hastada depresyon, uyku bozukluğu ve cinsel işlev bozukluğuna eğilim saptadık. Bazı sosyodemografik özelliklerin ve hormon reseptör durumunun cinsel işlevselliği etkileyebileceği ortaya çıktı. Bu nedenle meme kanseri tanısı ile takip edilen hastalarda bu belirtilerin sorgulanması ve değerlendirilmesi önemlidir.

Anahtar Kelimeler: meme kanseri, hormonoterapi, depresyon, uyku, cinsel fonksiyon

Introduction

Breast cancer is the most common type of cancer in women, and it is a disease that has heterogeneous features both biologically and clinically [1].

From the moment of the diagnosis of breast cancer, it creates a crisis that affects the patient's life in different aspects such as physical, psychological, spiritual, and social. In this crisis, some reactions are common in every patient, regardless of age, ethnicity, and stage of the disease [2].

Adjuvant endocrine treatment reduces recurrence and increases survival rates in receptor-positive tumors [3]. However, endocrine treatments (eg ovarian suppression, SERMs such as tamoxifen) reduce estrogen levels and can modulate the central nervous system by their estrogen antagonist actions, which can inhibit serotonergic mechanisms in the brain, causing mood and sleep disturbances [4, 5]

Also, side effects of tamoxifen are known as hot flashes, vaginal dryness, cataracts, thromboembolism, and increased risk of endometrial cancer [6]. These side effects may also reduce the patient's interest and desire for sexual life.

Sexual problems observed in women with breast cancer may be the result of anxiety and depression experienced when diagnosed with cancer, as well as side effects of surgery, chemotherapy, radiotherapy, and endocrine treatment [7].

Depression and anxiety are very common in breast cancer patients, which could reduce adherence to the treatment, and is associated with significant functional impairment and increased risk of mortality [8]. Despite all these harms and high frequency; depression, insomnia, and sexual problems that occur in patients can be ignored by both healthcare professionals and researchers. In this context, emphasizing the importance of the follow-up and treatment of depression, sleep and sexual dysfunctions in early-stage breast cancer patients receiving endocrine treatment can improve the quality of life of patients by struggling against the poor quality of life.

Therefore, in this study, we aimed to evaluate the effects of adjuvant endocrine treatment and other variables on depression, sleep quality, and sexual dysfunction in patients with early-stage breast cancer.

Materials and Methods

Our study is conducted between September 2018 and March 2020 with the participation of 105 patients who were diagnosed with hormone receptor-positive early-stage (stage I-III) breast cancer who were receiving endocrine treatment for at least 3 months and still receiving in the department of oncology of our hospital.

The inclusion criteria of the study are being 18 years of age and older, being diagnosed with stage I-III breast cancer according to the TNM Staging System, having received endocrine treatment for at least 3 months, volunteering to participate in the study. Patients were selected regardless of their previous chemotherapy or radiotherapy history, and patients with distant organ metastasis were not included in the study.

This study is a cross-sectional study conducted to detect depression, sleep quality, and sexual dysfunction in women with breast cancer who are receiving endocrine treatment. The questionnaires were administered in a single interview by interviewing the patients one-on-one and taking verbal consent from the patient, paying attention to the principle of voluntary participation. Cancer type and stage, chemotherapy, radiotherapy information is obtained from the patient file.

Potential study participants were approached at the oncology outpatient clinic. The heads and interns of clinics of oncology were informed about the study by one of the researchers. In this way, the interns became able to answer questions if the participants would ask. The investigators explained the purpose of the study to patients who met the inclusion criteria, and face to face questionnaire was administered after obtaining the consent of the patients. They were assured of their anonymity and of confidentially, and they were told that they could drop out at any time. The subjects were administered three questionnaires that look around 20 to 30 min to complete. The data collected from patients and questionnaire forms were preserved in the research folder in the paper. Sociodemographic form, Beck Depression Inventory, Pittsburgh Sleep Quality Index (PSQI), and Female Sexual Function Index (FSFI) were used as data collection methods. The study was approved by the institutional ethics committee. All procedures performed under the national research committee's ethical standarts and Helsinki declaration updated in 2013.

Methods of Assessment

Beck Depression Inventory (BDI)

The main version of the scale was prepared by Beck et al. [9]. In this study, the 1978 version of the Beck form adapted by Hisli was used [10].

There are 21 questions with four options for each in the Beck Depression Inventory form. The patient is asked to select and mark the sentence that best describes how the person felt in the last week, including the day of the questionnaire, and each item gets a score between 0 and 3. The highest score that can be obtained on the scale is 63. In this study revise Beck depression inventory was used. According to the Beck Depression Inventory (BDI-II) scoring system, 0–13 points indicate minimal depression, 14-19 points indicate mild depression, 20-28 points indicate moderate depression and 29-63 indicate severe depression [9].

Pittsburgh Sleep Quality Index (PSQI)

PSQI is a self-report measure that evaluates sleep quality and disorder over one month period. According to the Pittsburgh Sleep Quality Index (PSQI), a global PSQI score ≤5 indicates ''good sleep quality'', and >5 indicates ''poor sleep quality''. PSQI, which is an effective tool used to measure sleep quality in cancer patients, was developed by Buysse et al. in 1989. Reliability and validity studies in our country were performed by Ağargün et al. (1996) [11].

Female Sexual Function Index (FSFI)

Female Sexual Function Index is a Likert-type scale consisting of 19 items developed by Rosen et al. to evaluate female sexual functions. The scale was created by the researchers who developed the sexual functions of women in the last month, 6 subgroup scores, and FSFI score calculation scale, and it is made according to a scoring index [12]. The Turkish validity and reliability analysis of the scale were conducted by Öksüz and Malhan (2005). In the study performed by Taş et al. in 2006 in Turkey the functional status; If FSFI score is >30, it is stated as good, if between 23-29 it is stated as medium, if <23 it is stated as bad [13]. (Table 1)

Statistical methods

IBM SPSS (Statistical Programme for Social Scientists) version 20.0 (IBM Corp., Armonk, Newyork, USA) program was used for the statistical analysis of the study. The Kolmogorov Smirnov test was used to evaluate the compatibility of the data for normal distribution. Continuous data matching to normal distribution were given as

Table 1. Female Sexual Function Index scoring chart [14].

FSFI domain	Questions	Score range	Factor number	Minimum score	Maximum score	Total score
Desire	1,2	1-5	0.6	1.2	6.0	
Arousal	3,4,5,6	0-5	0.3	0	6.0	
Lubrication	7,8,9,10	0-5	0.3	0	6.0	
Orgasm	11,12,13	0-5	0.4	0	6.0	
Satisfaction	14,15,16	0/1-5	0.4	0.8	6.0	
Pain	17,18,19	0-5	0.4	0	6.0	
Total score (FSFI score)				2.0	36.0	

Mean ± Standard Deviation, continuous data not matching to a normal distribution as Median (highest - lowest value or interquartile range), and categorical data as frequency (percentage). Mann Whitney U test was used to compare the data of two groups that did not match with the normal distribution between independent groups. Independent samples t-test was used to compare the data of two groups with normal distribution. Chi-square or Fisher's Exact test was used to compare independent categorical variables. Spearmen correlation test was used between BDI, PSQI and FSFI. All statistical tests were done bilaterally and $p < 0.05$ was considered statistically significant.

Results

The demographic characteristics of the patients included in the study are examined; 105 women were included in the study, and the median age of the individuals was 53 (34-79). 80% of the patients were married, 19% were divorced, and the median number of children they had was found to be 2 (0-9). The single patients didn't declare that they have sexual partners. 67% of the cases are housewives, 21% are retired and 17% continue to work actively.

When the patients were evaluated in terms of their menopausal status at the time of the interview, the menopausal status of seven patients was unknown, 61.9% were in the postmenopausal stage, 17.1% were in the premenopausal stage, and 14.3% were in the perimenopausal stage.

The surgery and pathology information of the patients included in the study are shown in Table 2 below.

Surgery type are unknown for four patients because data was missing. Tumor stage for 8 patients and Her2 value of nine patients are also unknown because data was missing. Perineural invasion is also unknown in 22 patients and extracapsular extension is unknown in 26 patients because pathological data could not be reached.

When the endocrine treatment agents taken by the patients were examined, 62 (59.6%) patients used tamoxifen, 29 (27.9%) patients used letrozole, and 13 (12.5%) patients used anastrozole. The median duration of endocrine treatment of the patients included in the study was followed for 24 months (3-120). Detailed data on Adjuvant treatments and their durations are shown in Table 3.

When we look at the BDI score information of the patients, 46.5% had minimal depression, 26.7% had mild depression, 24.7% had moderate depression, and 1.9% had severe depression. BDI value was below the median value of 10 in 55.8% of the patients, and above the median value of 10 in 44.2% of the patients.

When the sleep quality rates were examined, 41 (39.4%) patients had good and 63 (60.6%)

Table 2. Surgery and pathology information of patients

Number of patients		105
Surgery type, n (%)	Breast-Conserving Surgery (BCS)	33 (31,4)
	Modified Radical Mastectomy (MRM)	68 (64,8)
	unknown	4 (3,8)
Stage T, n (%)	T0	2 (1,9)
	T1	38 (36,2)
	T2	48 (45,7)
	T3	7 (6,7)
	T4	2 (1,9)
	unknown	8 (7,6)
Stage N, n (%)	N0	46 (43,8)
	N1	22 (21,0)
	N2	11 (10,5)
	N3	16 (15,2)
	unknown	10 (9,5)
ER, n (%)	positive	98 (93,3)
	negative	7 (6,7)
PR, n (%)	positive	93 (88,6)
	negative	12 (11,4)
Her-2, n (%)	positive	51 (48,5)
	negative	45 (42,9)
	unknown	9 (8,6)
Grade, n (%)	1	13 (12,4)
	2	39 (37,1)
	3	16 (15,2)
	unknown	37 (35,2)
LVI, n (%)	Yes	39 (37,1)
	No	49 (46,7)
	unknown	17 (16,2)
PNI, n (%)	available	15 (14,3)
	umavailable	68 (64,7)
	unknown	22 (21,0)

Table 2. continue next page

ECE, n (%)	Yes	21 (20,0)
	No	58 (55,2)
	unknown	26 (24,8)
Stage, n (%)	1A	24 (25,5)
	1B	22 (23,4)
	2A	25 (26,6)
	2B	3 (3,2)
	3A	8 (8,5)
	3B	12 (12,8)

T: Tumor, N: Lymph Node, ER: Estrogen Receptor, PR: Progesterone Receptor, Her2: Human Epidermal Growth Factor Receptor 2, LVI: Lymphovascular invasion, PNI: Perineural Invasion, ECE: Extracapsular Extension

patients had poor sleep quality. As a result, a tendency towards sleep disorder was observed in the patients who participated in the study.

When the FSFI scores of the patients were examined, low scores were found in the majority of the patients, and a tendency to sexual dysfunction was observed. According to the FSFI scores, 81 (77.1%) patients scored bad, 16 (15.2%) patients were found to be fair, and 8 (7.6%) patients scored well in terms of sexual function.

BDI, PSQI, and FSFI score information of the patients are summarized in Table 4.

When demographic characteristics of the patients with low and high BDI, PSQI, and FSFI scores were compared, no statistically significant relationship was found with the age, the number of children, social security, the menopausal status of the patients ($p>0.05$). However, the relationship between marital status and FSFI score was found to be statistically significant, and in 70% of married patients, sexual function was found to be poor ($p=0.04$).

When the patients' ER and PR positivity percentage rates were examined, no significant relationship was observed between the BDI scores and positivity percentage ($p=1.0$ for ER, $p=0.26$ for PR). However, although it was not statistically significant, a decrease in the ER percentage and an increase in the BDI score, that is, a tendency to depression, was observed ($p=0.06$). There was no significant effect of ER positivity ($p= 0.15$) and ER percentage ($p=0.35$) on sexual function. A tendency to sexual dysfunction was observed in patients with PR positivity and it was found to be statistically significant ($p=0.005$). There was no significant correlation between PR percentages and FSFI score ($p=0.55$).

No significant relationship was found between adjuvant chemotherapy, radio-therapy, trastuzumab, Luteinizing hormone releasing hormone (LHRH) treatment status, duration of treatment and BDI, PSQI and FSFI score values. There was no significant relationship between different endocrine therapy agents (tamoxifen/ anastrozole/ letrozole) in patients with depression, sleep and sexual dysfunction ($p> 0.05$). However, although not statistically significant, patients using aromatase inhibitors had a higher tendency to sleep disorder. Poor sleep quality was found in 29 (69%) of 42 patients using aromatase inhibitors. However, although not statistically significant, 90% of the patients who took aromatase inhibitors tended to sexual dysfunction.

Comparison of BDI, PSQI, and FSFI scores with adjuvant treatments is summarized in Table 5.

There was a strong correlation between PSQI and BDI ($p<0.001$), and a moderate inverse

Table 3. Adjuvant treatments and their durations

Adjuvant CT, n (%)	Yes	76 (72,4)
	No	28 (26,7)
	unknown	1 (1,0)
Adjuvant CT regimen, n (%)	Anthracycline and taxane	58 (55,2)
	Anthracycline	12 (11,4)
	Taxane	2 (1,9)
	Other	33 (31,4)
Adjuvant CT duration, the median day		149 (25-462)
Adjuvant trastuzumab, n (%)	Yes	32 (30,5)
	No	69 (65,7)
	unknown	4 (3,8)
Adjuvant RT, n (%)	Yes	81 (78,6)
	No	22 (21,4)
Adjuvant RT duration, the median day		35 (4-56)
Adjuvant Endocrine Treatment type, n (%)	Tamoxifen	62 (59.6)
	Letrozole	29 (27.9)
	Anastrozole	13 (12.5)
Adjuvant Endocrine Treatment duration, median month		24 (3-120)
Adjuvant LHRH, n (%)	Yes	10 (9,5)
	No	95 (90,5)

CT: Chemotherapy, RT: Radiotherapthy, LHRH: Luteinizing hormone releasing hormone

correlation (P=0.001) between FSFI-BDI scores. In summary, it was found that sleep disorders and sexual dysfunction increased in patients with depression. The correlation analysis of BDI, PSQI, and FSFI scores is summarized in Table 6.

Discussion

First of all, if we examine the results obtained with the Beck Depression Inventory, our first questionnaire, 44.2% of the patients tended to depression with a BDI score of 10 and above. In a study, results confirmed that side effects of endocrine treatment were significantly associated with anxiety and depression [8]. The prevalence of depression and anxiety in that study were 33.4% (133) and 13.3% (53), respectively. In another study by Weitzner et al., based on BDI questionnaires in a population of patients with 5 years of disease-free period, they found 29% depression among breast cancer patients. [15]. The reason why this rate was found to be higher in our study may be that our patient group consisted of patients who still received endocrine treatment and did not reach the disease-free period. In another study based on HADS (Hospital Anxiety and Depression Scale) score, comorbid depression was found in approximately one-quarter of all breast cancer patients, and this rate was estimated to be between 20% and 30% in early breast cancer and more than 50% in advanced and palliative stages [16]. Although all of the patients in our

Table 4. Beck, PSQI, and FSFI score information of the patients

Beck Depression score, median (min-max)		10 (0-33) if you want average 11,5±7,8
Beck Depression score, n (%)	Low	58 (55,8)
	High	46 (44,2)
	Minimal depression	47 (%46,5)
	Mild depression	27 (%26,7)
	Moderate depression	25 (%24,7)
	Severe depression	2 (%1,9)
PSQI score, median (min-max)		7 (1-16) if you want average 7.2 ±3.3
PSQI score, n (%)	Good	41 (39,4)
	Poor	63 (60,6)
FSFI score, median (min-max)		2,6 (2-34) if you want average 11,7±11,3
FSFI score, n (%)	Good	8 (7,6)
	Fair	16 (15,2)
	Bad	81 (77,1)

BDI: Beck Depression Inventory, PSQI: Pittsburgh Sleep Quality Index,
FSFI: Female Sexual Function Index

Table 5. Comparison of BDI, PSQI, and FSFI Scores with Adjuvant Treatment.

	BDI	PSQI	FSFI
Adjuvant Chemotherapy (Yes/No)	P = 0,18	P = 1,00	P = 0,86
Adjuvant Chemotherapy regimen type	P = 0,11	P = 0,39	P = 0,54
Adjuvant Chemotherapy duration	P = 0,62	P = 0,93	P = 0,59
Adjuvant Trastuzumab (Yes/No)	P = 0,61	P = 0,60	P = 0,80
Adjuvant RT (Yes/No)	P = 0,92	P = 0,75	P = 0,84
Adjuvant Endocrine Treatment type	P = 0,74	P = 0,34	P = 0,09
Adjuvan Endocrine Treatment duration	P = 0,56	P = 0,78	P = 0,15
Adjuvant LHRH (Yes/No)	P = 0,33	P = 0,51	P = 0,39

RT: Radiotherapy, LHRH: Luteinizing hormone releasing hormone

Table 6. Correlation relationship

		FSFI score	BDI score
PSQI score	r	-0,04	0,57
	p	0,71	<0,001
FSFI score	r		-0,36
	p		<0,001
r: correlation coefficient			

BDI: Beck Depression Inventory, PSQI: Pittsburgh Sleep Quality Index,
FSFI: Female Sexual Function Index

study were in the early stage, the reason for the higher prevalence of depression compared to this study may be that the number of patients who received chemotherapy in our study was higher. On the other hand, the prevalence in our study was significantly lower than a study conducted in Iran which reported the prevalence of depression among cancer patients to be 95.9% [17] Different living environments and medical conditions may explain such a large difference.

In a recent meta-analysis of 16,298 women from 17 countries between 2000 and 2019, the prevalence of anxiety in breast cancer patients was found to be 41.9%. The meta-analysis showed a high level of anxiety among breast cancer patients [18]. The different prevalence rates of depression or anxiety in different studies may be due to the type of cancer, the stage of cancer treatment, the severity of the disease, the status of family support, patient's economic level and cultural context and education level among the patients studied.

In our study, the depression status of the patients before endocrine treatment is not known, since the cases were analyzed in cross-section. However, in a retrospective analysis study examining the development of depression in patients in whom tamoxifen treatment was initiated, it was shown that no statistically significant relationship was found between the initiation of tamoxifen treatment and the subsequent development of depressive symptoms [19].

In the literature, it has been reported that the prevalence of depressive symptoms increases in breast cancer patients receiving chemotherapy and radiotherapy [20, 21]. In our study, no significant difference was found between BDI, PSQI and FSFI score values levels in the group that received adjuvant chemotherapy and radiotherapy and the group that did not. It was thought that the reason for the lack of a significant relationship between chemotherapy and depression in our study may be since most of the patients completed the chemotherapy period and at least 3 months had passed.

Sleep disorders, one of the most important cancer-related problems affecting the quality of life, are observed with a rate of 30-50% in cancer patients [22]. In our study, patients with breast cancer under endocrine treatment were evaluated with the Pittsburgh Sleep Quality Index, and 60.6% of patients had poor sleep quality, and sleep disorders were observed in the vast majority of patients.

In a meta-analysis evaluating the relationship between sleep disorders and other symptoms in cancer patients, especially fatigue and depression, it was shown that the connection of insomnia with depression was moderate [23]. In the study of Palesh et al., it was found that sleep problems were positively correlated

with depression and fatigue [24]. In our study, parallel to previous studies, there was a high correlation between BDI and PSQI scores, and a significant correlation was found between sleep disturbance and depression disposition in patients.

When the sexual function index results of our study were examined, a tendency to sexual dysfunction was observed in the majority of the patients (77.1%). Similar to the result obtained in our study Joanne et al. observed that women treated with tamoxifen may experience symptoms of sexual dysfunction [25]. However, the effect of tamoxifen on sexual function is uncertain, and conflicting publications are showing that endocrine treatment causes sexual dysfunction. In the study of McCaughan et al., it was found that women who received endocrine treatment did not experience a significantly different sexual dysfunction than women who did not receive endocrine treatment [26]. Similarly, Ganz et al. examined the relationship between tamoxifen use and sexual function in breast cancer patients and found that there was no difference in sexual functioning among women treated without tamoxifen [27].

When the effect of demographic characteristics of the patients on sexual function was examined, no significant relationship was found, except being married which was found as a negative effect on sexual functionality (P=0.04). There are not enough studies on this subject but this result suggested that the disease may have affected their sexual life worse in married patients than in single or divorced patients since they experienced the entire disease process and difficulties with their sexual partners.

In our study, when the effects of ER and PR positivity on sexual function were compared, patients with PR positivity showed a tendency to sexual dysfunction, and it was found to be statistically significant. However, its clinical significance is not clear. In a different study based on FSFI questionnaires similar to our study, no relationship was found between ER status and sexual function in breast cancer patients. However, only postmenopausal patients were included in the study [28].

In the literature, it is known that sexual dysfunction and depression are associated with both cause and effect in breast cancer patients [29, 30]. In our study supporting the literature, a moderate correlation was observed between depression and sexual dysfunction. In our study, we evaluated the cross-sectional status of breast cancer patients who were hormone receptor-positive and were receiving endocrine treatment, and we found sexual dysfunction in most of the patients. However, we found no difference in the effects of different endocrine treatment agents (tamoxifen, anastrozole, and letrozole) on sexual function. The limited number of patients and different follow-up intervals were the main limitations of our study. The other limitation was that we did not know the anxiety and depression scores of the patients before taking endocrine treatment. An additional limitation was that we could not accurately evaluate the menopausal status of patients using LHRH analogs.

Although endocrine treatment is not a risk factor, we found a tendency to depression, sleep disturbance, and sexual dysfunction in most patients. The high incidence of depression in breast cancer itself makes it particularly difficult to isolate and measure the psychological impact of endocrine treatments on patients. In our study, it was revealed that some sociodemographic features and hormone receptor status may affect sexual functionality. Future research may shed light on the size of these independent risk factors and as a result, it may guide treatment decisions for breast cancer patients in the coming years.

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