Adherence to Adjuvant Hormone Therapy with Tamoxifen and Anastrozole using ARMS-12 and MMAS-4

doi: https://doi.org/10.32635/2176-9745.RBC.2022v68n2.1960

Adesão à Terapia Hormonal Adjuvante com Tamoxifeno e Anastrozol utilizando ARMS-12 e MMAS-4

Adherencia a la Terapia Hormonal Adyuvante con Tamoxifeno y Anastrozol utilizando ARMS-12 y MMAS-4

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ABSTRACT

Introduction: Among breast cancers, approximately 75% of women are hormone receptors-positive, and these are more likely to respond to hormone therapy with anastrozole and tamoxifen. Although effective, they have significant rates of non-adherence. **Objective:** To evaluate adherence to adjuvant hormone therapy with tamoxifen and anastrozole in patients consulted at the Mastology and Chemotherapy Outpatient Clinic of *Hospital São Paulo* between 2019 and 2020. **Method:** Cross-sectional study carried out with 102 women between September 2019 and March 2020. Adherence to hormone therapy was evaluated using the Morisky Medication Adherence Scale (MMAS-4) and Adherence to Refills and Medications Scale of 12 items (ARMS-12). **Results:** The mean age was 61.5 years (59.3-63.6). Among the patients, 27.7% used tamoxifen and 72.3%, anastrozole. 84.4% of them reported discomfort in using the medication, the most frequent were hot flashes (42.2%) and joint pain (55.9%). 79.2% scored the ARMS>12 scale, about 90% of the women scored MMAS-4 up to 2 points, but there was no significant difference between the types of hormones used for adhesion scales (p=0.815 to p=0.489). **Conclusion:** Adherence to hormone therapy was relatively low, regardless of the hormone used, and these patients may be at risk of inadequate clinical response.

Key words: medication adherence; patient compliance; anastrozole/therapeutic use; tamoxifen/therapeutic use; breast neoplasms.

RESUMO

Introdução: Entre os cânceres de mama, aproximadamente 75% das mulheres são receptores hormonais positivos, sendo estas mais propensas a responderem à hormonioterapia com anastrozol e tamoxifeno. Apesar de eficazes, apresentam taxas significativas de não adesão. **Objetivo**: Avaliar a adesão à terapia hormonal adjuvante com tamoxifeno e anastrozol em pacientes atendidos nos Ambulatórios da Mastologia e de Quimioterapia do Hospital São Paulo entre os anos de 2019 e 2020. **Método:** Estudo transversal com 102 mulheres, realizado entre os meses de setembro de 2019 e março de 2020. A adesão à terapia hormonal adjuvante foi avaliada utilizando-se as escalas *Morisky Medication Adherence Scale* (MMAS-4) e *Adherence to Refills and Medications Scale of 12 items* (ARMS-12). **Resultados:** A média de idade foi de 61,5 anos (59,3-63,6). Entre as pacientes, 27,7% faziam uso de tamoxifeno e 72,3% de anastrozol. Relataram desconforto em relação ao uso do medicamento 84,4%, sendo as ondas de calor (42,2%) e as dores articulares (55,9%) os mais frequentes. A escala de ARMS>12 foi pontuada por 79,2%; cerca de 90% das mulheres pontuaram a MMAS-4 até dois pontos, porém não houve diferença significativa entre os tipos de hormônios utilizados para escalas de adesão (p=0,815 e p=0,489). **Conclusão:** A adesão à hormonioterapia observada foi relativamente baixa, independentemente da endocrinoterapia, podendo essas pacientes estarem em risco de inadequação quanto à resposta clínica.

Palavras-chave: adesão à medicação; cooperação do paciente; anastrozol/uso terapêutico; tamoxifeno/uso terapêutico; neoplasia da mama.

RESUMEN

Introducción: Entre los cánceres de mama, aproximadamente el 75% de las mujeres son receptores hormonales positivos, y estas son más propensas a responder a la terapia hormonal con anastrozol y tamoxifeno. Aunque son eficaces, tienen tasas significativas de no adherencia. **Objetivo:** Evaluar la adhesión a la terapia hormonal adyuvante con tamoxifeno y anastrozol en pacientes atendidas en las Clínicas Ambulatorias de Mastología y Quimioterapia del Hospital São Paulo entre 2019 y 2020. **Método:** Este es un estudio transversal realizado con 102 mujeres entre septiembre de 2019 y marzo de 2020. La terapia hormonal adjunta se evaluó utilizando las escalas *Morisky Medication Adherence Scale* (MMAS-4) e *Adherence to Refills and Medications Scale of 12 items* (ARMS-12). **Resultados:** La edad media fue de 61,5 años (59,3-63,6). Entre las pacientes, el 27,7% utilizaron tamoxifeno y el 72,3% anastrozol. El 84,4% de ellas reportaron molestias en relación con el uso del medicamento, siendo los más frecuentes los sofocos (42,2%) y el dolor articular (55,9%). 79,2% puntuaron la escala ARMS>12, alrededor del 90% de las mujeres obtuvieron MMAS-4 hasta dos puntos, pero no hubo diferencia significativa entre los tipos de hormonas utilizadas para escalas de adhesión (p=0,815 a p=0,489). **Conclusión:** La adherencia de la terapia hormonal observada fue relativamente baja, independientemente de la hormona utilizada, y estas mujeres pueden estar en riesgo de respuesta clínica inadecuada.

Palabras clave: cumplimiento de la medicación; cooperación del paciente; anastrozol/uso terapéutico; tamoxifeno/uso terapéutico; neoplasias de la mama.

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INTRODUCTION

Incidence and mortality by cancer is increasing worldwide not only due to ageing, and population growth, but because of changes of distribution and prevalence of risk factors of cancer, specially associated with socioeconomic development. Women's breast cancer is the most frequent for all Brazilian regions, except non-melanoma skin cancer. In the State of São Paulo, 18,280 new cases of breast cancer were estimated for 2020, and in the capital, 5,350 cases[1].

One of the main molecular targets in the pathogenesis of breast cancer is estrogen receptor alpha (ERα), which is expressed in approximately 70% of invasive breast cancers. The tumors that present both the expression of the estrogen and progesterone receptor in at least 1% of the tumor cells are classified as hormone receptor-positive (HR+), being these more probable in older women. In this case, they are more propense to respond to hormone agents[2,3].

Among the hormone agents utilized in the treatment of breast cancer are tamoxifen, a selective estrogen receptor modulator, effective in the treatment of pre and post-menopausal women and aromatase inhibitors (anastrozole, exemestane and letrozole) which decrease the circulating estrogen levels by inhibiting the peripheral conversion of androgens, effective in post-menopausal women. The actions of these agents are responsible for preventing the recurrence of the disease and prolong disease-free survivorship[2].

The appearance of oral anticancer therapy which allows the self-administration by the patients is an important benefit, however, raised concerns in relation to low adherence to the therapy and its harming effects on clinical results[4]. Adherence to medication is the process through which the patients take their medication as prescribed[5]. Patients can unintentionally non-adhere to medicines due to forgetfulness, carelessness, health literacy and socioeconomic factors[6].

There are evidences that 10%-50% of the patients diagnosed with breast cancer failed to take the correct dosage of the medicines at the prescribed frequency[7]. The identification of patients who are not taking their medications as prescribed by health practitioners allows to devise future interventions in order to promote improvements of the adherence to drug therapy and consequently contribute for desirable clinical outcomes[8]. Adherence is the key for a successful hormone therapy for breast cancer which actually increases survivorship rates, reduces recurrence, mortality, is administered for a long period of time and requires management of adverse events[9].

The measures of adherence to medication can be subjective and objective (direct and indirect). Subjective measures comprehend those which require evaluation either by the clinician or the patient's medication-taking behavior. Among them, self-report is one of the most common tools utilized to assess subjectively the adherence, but its disadvantage is sub-notification of non-adherence by the patient to avoid the disapproval of the physician. The objective measures include counting pills, electronic monitoring, secondary databases analysis and biochemical measures and are seen as an improvement compared to subjective measures. Subjective and objective measures have advantages and disadvantages, it is recommended to use them combined[10,11].

Among the scales utilized to evaluate the adherence to adjuvant hormone therapy in women with breast cancer, the most frequent is the Morisky Medication Adherence Scale – MMAS-4[12-15]. In 2019, Aguiar[16] validated, translated and completed a cross-cultural adaptation to Brazilian Portuguese of the instrument Adherence to Refills and Medications Scale of 12 items (ARMS-12) to evaluate the adherence of patients with onco-hematological diseases to the treatment with oral antineoplastics. The findings presented valid, reliable psychometric properties, can be utilized to evaluate the adherence of the patients with onco-hematologic diseases in treatment with oral antineoplastics, especially for the population with low level of literacy. In addition, the validation of the instrument had positive and significant correlation with the results obtained by MMAS-4[16].

In this context, this article has the objective to evaluate the adherence to adjuvant hormone therapy of 102 patients consulted at the Mastology Outpatient and at the Chemotherapy Outpatient of *Hospital São Paulo* based in the scale ARMS-12 for oral chemotherapy and describe possible associations to non-adherence from the patient's self-report.

METHOD

Cross-sectional study, non-probabilistic sample with 102 female patients diagnosed with hormone-receptor positive breast cancer submitted to treatment with tamoxifen or anastrozole, consulted at the Outpatient Mastology and Chemotherapy of "*Universidade Federal de São Paulo (Unifesp)*" between September 2019 and March 2020. The patients diagnosed with breast cancer were followed-up during clinic visits and received oral medication.

Women diagnosed with hormone-receptor positive breast cancer in hormone therapy with tamoxifen or anastrozole were enrolled. Those with cognitive deficit unable to understand the information and who refused to sign the Informed Consent Form (ICF) were excluded.

Data were collected through structured interview and applied the instruments already validated by the "*Estudo sobre Saúde, Bem-Estar e Envelhecimento* (SABE)[17]", to analyze the demographic, socioeconomic and health characteristics. MMAS-4[12] and ARMS-12[13] were utilized to evaluate the adherence to hormone therapy with tamoxifen and anastrozole.

The scale MMAS-4 is the fastest questionnaire to administer and register with closed-questions yes or no and can identify the obstacles for non-adherence. To every response yes, 0 is attributed and to no, score 1. The evaluation of the score is defined in levels of adherence: high adherence (score 4, if the patient responds no to all questions), average adherence (score 3 or 2, if the patient responded yes to one or two questions, respectively) and low adherence (score 1 or 0, if the patient responded yes to 3 or 4 questions, respectively)[18].

The 12-questions ARMS scale evaluates refill and medication taking, it is divided in two subscales: the 8-items scale addresses the use of the medications and evaluates the patient's ability to correctly self-administer the regimen and the 4-items scale, the patient's ability in refilling the medications within the schedule. Each item consists in a 4-points Likert scale (1= none of the time; 2= some of the time; 3= most of the time; 4= all the time). The scores range from 12 (best adherence) to 48 (worst adherence)[19,20].

The independent variables to characterize the sample investigated and evaluation of the adherence were:

- Sociodemographic – age (mean in years); marital status (married/living together, widow/widower/single, separated/divorced); number of live births (mean); education (elementary, high-school or university).
- Socioeconomic – current job (employed, unemployed); reasons for unemployment [dismissed, disease (breast cancer), retired, public employee without function]; self-employed (yes, no); category of income [retired for length of service, retired due to disability, pensioner, Non-Contributory Pension, applications, salary, other].
- Breast cancer treatment – hormone therapy (tamoxifen, anastrozole); mean of the number of medications without hormone therapy; mean of the number of medication with hormone therapy; treatments (surgery, radiotherapy, surgery/radiotherapy, surgery/chemotherapy, surgery/chemotherapy/medications, surgery/chemotherapy/radiotherapy, surgery/chemotherapy/radiotherapy/medications) antidepressants (does not use, fluoxetine, carbamazepine, amitriptyline, bupropion, gabapentin, sertraline, venlafaxine); discomfort with the treatment (yes, no); mean of adverse reactions; types of adverse reactions (hot flashes, night sweats, emotional problems, sleep disorders, weight gain, loss of libido, joints pains, other events); hour of administration (morning, afternoon, evening, no schedule).
- Accessibility – distant from home (yes, no); obtained the medications (yes, all, some, few, no), motives (unavailable at National Health System (SUS), had to pay); who paid the medications (the patient, the patient/other, another person).
- Health general characteristics – health self-perception (very good, good, regular, poor, severe); single cancer (yes, no); alcohol use (no, yes), tobacco use (nonsmokers, ex-smoker, smoker).

The Institutional Review Board of "*Hospital Universitário do Hospital São Paulo (HSP), Unifesp*" approved the study, report 3.426.366, CAAE: 12433819.0.0000.5505.

Initially, the analysis of the data was descriptive with the calculation of the percentages (means and standard deviation) and respective confidence intervals of 95% (CI95%) for the qualitative variables (or quantitative). The adherence to hormone therapy utilized the scale MMAS-4 with the calculation of percentage (CI95%).

Linear regression models were utilized to evaluate which variables would be independently associated with hormone therapy, whose response variable was the total score of the scale ARMS-12. Primarily, simple models of linear regression were adjusted (bivariate analysis) of the dependent variable with each explanatory variable (covariates). From this bivariate analysis, all the variables which presented $p<0.20$ were included in the multiple regression model. The explanatory variables which were not significant in this multiple model ($p>0.05$) were removed one by one until the final adjusted model was achieved and those statistically correlated with the total score of the scale ARMS-12 remained. From the adjusted model, possible interactions of second order among the explanatory variables which remained in the final adjustment were tested. The variables age and Morisky remained in all the stages of modeling, including the final adjustment despite the level of statistical significance.

The hypothesis of normality of the data was evaluated through the analysis of residues where the histogram of residues and the normal probability plot were constructed. The entire analysis was executed in Stata16® and were deemed as significant the results with $p<0.05$.

RESULTS

The present study enrolled 102 women diagnosed with hormone receptor positive breast cancer using tamoxifen or anastrozole. Of these, six were excluded from the analyzes because they refused to sign the Informed Consent Form

(ICF) and did not respond to the questionnaire, and eventually 96 women were investigated.

Table 1 describes the characteristics of the women investigated. The sociodemographic characteristics revealed that the mean age of the patients was 61.5 (59.3-63.7) years, with more prevalence of widows/single and nearly 1.6 sons live births. There was more prevalence of women with complete elementary school. Most of them did not work because of breast cancer predominantly, but 75% were self-employed and the great prevalence was retired for length of service.

Hormone therapy was being used at the moment of the interview, 72.3% were taking anastrozole and 27.7%, tamoxifen. In average, these women were in use of 3.1 medications, including hormone blocker. More prevalence of women submitted to surgery, chemotherapy and radiotherapy for cancer treatment was found.

Sertraline was used by 4.9% and venlafaxine by 4.9% of these women. Approximately 85% of them reported they felt some discomfort with the treatment. A mean of 2.2 adverse events was reported with great prevalence of joint pains, followed by hot flashes, sleep disorders and night sweats. There was more prevalence of women who preferred to take the hormone in the morning.

More prevalence of women who managed to obtain their medication at SUS was found, including tamoxifen and anastrozole, but among these women, 26.5% claimed the medications were unavailable at SUS at the moment they went to pick them up. Most of the women perceived their health status as regular. Of the 96 patients, 84.4% did not relapse or did not have another type of cancer. As for tobacco and alcohol use, the great prevalence was of women who had ever smoked and did not intake any kind of alcohol (Table 1).

Table 1. General description of the participants. Adherence to adjuvant hormone therapy with tamoxifen and anastrozole in patients of Hospital São Paulo, 2019-2020 (n=96)

Sociodemographic	% (95% CI)	n
Mean of age, years (standard deviation)	61.5 (59.3-63.7)	96
Marital status		
Married/Living together	42.7 (33.1-52.9)	41
Widow/Single	49.0 (39.0-59.0)	47
Separated/Divorced	8.3 (4.2-15.9)	8
Average number of live births	1.6 (1.5-1.7)	96
Education		
Elementary	69.6 (59.9-77.8)	71
High school or university	30.4 (22.2-40.1)	31
Current job		
Employed	39.6 (30.2-49.8)	38
Unemployed	60.4 (50.2-69.8)	58
Reason of unemployment		
Dismissed	11.8 (6.8-19.7)	58
Disease (breast cancer)	28.4 (20.4-38.0)	12
Retired	2.0 (0.5-7.6)	29
Public employee without function	1.0 (0.1-6.8)	3
Self-employed	75.0 (65.3-82.7)	72
Category of income		
Retired for length of service	28.4 (20.4-38.0)	30
Retired due to disability	11.8 (6.8-19.7)	29
Pensioner	4.9 (2.0-11.3)	12
Non-contributory pension	1.0 (0.1-6.8)	5
Financial applications	1.0 (0.1-6.8)	1
Salary	20.6 (13.8-29.6)	21
Other	2.9 (1.0-8.8)	4

to be continued

Table 1. continuation

Treatment	% (95% CI)	
Hormone therapy		
Tamoxifen	27.7 (19.8-37.3)	28
Anastrozole	72.3 (62.6-80.2)	73
Mean of the total quantity of medications without hormone therapy	2.1 (1.7-2.5)	96
Mean of the total quantity of medications with hormone therapy	3.1 (2.7-3.5)	96
Treatments	% (95% IC)	
Surgery	8.8 (4.6-16.2)	6
Radiotherapy	5.9 (2.6-12.6)	9
Surgery/Radiotherapy	27.4 (19.6-37.0)	28
Surgery/Chemotherapy	3.9 (1.5-10.1)	4
Surgery/Chemotherapy/Medications	3.9 (1.5-10.1)	4
Surgery/Chemotherapy/Radiotherapy	29.4 (21.3-39.1)	30
Surgery/Chemotherapy/Radiotherapy/Medications	14.7 (9.0-23.1)	15
Antidepressants		
No	83.3 (74.7-89.4)	85
Fluoxetine	2.9 (0.9-8.8)	3
Carbamazepine	1.0 (0.1-6.8)	1
Amitriptyline	1.0 (0.1-6.8)	1
Bupropion	1.0 (0.1-6.8)	1
Gabapentin	1.0 (0.1-6.8)	1
Sertraline	4.9 (2.0-11.3)	5
Venlafaxine	4.9 (2.0-11.3)	5
Discomfort	84.4 (75.5-90.4)	96
Total adverse reactions (mean)	2.2 (1.8-2.6)	96
Adverse reactions		
Hot flashes	42.2 (32.9-52.0)	43
Night sweats	29.4 (21.3-39.1)	30
Emotional problems	23.5 (16.2-32.8)	24
Sleep disorders	31.4 (23.0-41.1)	32
Weight gain	29.4 (21.3-39.1)	30
Loss of libido	13.7 (8.2-22.0)	14
Joints pain	55.9 (46.0-65.3)	57
Other events	39.2 (30.1-49.1)	40
Time of administration		
Morning	43.2 (33.5-53.4)	41
Afternoon	7.3 (3.5-14.8)	7
Evening	29.5 (21.1-39.5)	28
Without schedule	20.0 (13.1-29.4)	19
Accessibility	**% (95% CI)**	
Access to treatment is difficult because of the distance from home?		
No	7.3 (3.5-14.6)	7
Yes	92.7 (85.4-96.5)	89

to be continued

Table 1. continuation

Accessibility	% (95% CI)	
Treatment medications were obtained?		
Yes. All	70.8 (6.9-79.1)	68
Some, yes, other, no	26.5 (18.7-36.0)	13
Did not obtain	15.6 (9.6-24.4)	15
Motives		
Unavailable at SUS	26.5(18.7-36.0)	74
Had to pay	33.3(24.5-43.4)	28
Who paid		
The patient	23.5 (16.2-32.8)	71
The patient/other	2.9 (0.9-8.8)	27
Other person	3.9 (1.5-10.1)	4
Characteristics of Health	**% (95% IC)**	
Self-perception of health		
Very good	11.5 (6.4-19.6)	11
Good	39.6 (30.2-49.8)	38
Regular	41.7 (32.1-51.9)	40
Poor	6.2 (2.8-13.3)	6
Severe	1.0 (0.1-7.2)	1
Single cancer	84.4 (75.5-90.4)	81
Alcohol use		
No	77.1 (67.5-84.5)	74
Yes	22.9 (15.5-32.5)	22
Tobacco use		
Non-smoker	62.5 (52.3-71.7)	60
Ex-smoker	33.3 (24.5-43.4)	32
Smoker	4.2 (1.5-10.7)	4

Captions: SUS = National Health System; CI = Confidence Interval.

Table 2 shows the results of the bi-variated analysis and based in these results, the variables with p<0.20 were selected for the adjustment of the multiple model. After the adjustment, it was noticed that the variables which were independently associated with the scale ARMS were current hormone (p=0.034), loss of libido (p=0.006), scale Morisky (p<0.001) and interaction between current hormone and libido (p=0.036).

Based in the adjustment, it was detected that by the scale MMAS-4, women using tamoxifen with loss of libido, had mean decrease of 2.95 in the scale ARMS, when compared to those using tamoxifen who did not have loss of libido (CI95%: -5.04; -0.86; p=0.006). Women in anastrozole with loss of libido had a mean decline of 1.42 in the scale ARMS when compared to those in anastrozole who did not have loss of libido (CI95%: -2.90; 0.05; p=0.058).

When comparing the use of anastrozole to tamoxifen among women without loss of libido, there was a mean decrease of 1.09 in the scale ARMS (CI95%: -2.10; -0.09; p=0.034). The use of anastrozole with tamoxifen among women with loss of libido did not show significant difference in the scale ARMS (p=0.184).

DISCUSSION

The main findings of the study showed that the mean age of the women investigated was 61.5 years, with more prevalence of widows or singles who did not work and received retirement benefits. Anastrozole was the oral hormone therapy most used (72.3%) and the majority of them claimed they have set a schedule to take the oral medication, but 20.0% preferred another schedule. It was found more prevalence of women submitted previously

Table 2. Coefficients of univariate analysis of linear regression, according to mean ARMS. Adherence to adjuvant hormone therapy with tamoxifen and anastrozole in patients of Hospital São Paulo, 2019-2020 (n=96)

	ARMS			
	Coefficient	**95% CI**		**p-value**
Anastrozole *vs* tamoxifen	-1.02	-2.18	0.15	0.086
Discomfort	-0.48	-1.90	0.94	0.504
Night sweats	0.68	-0.42	1.79	0.222
Loss of libido	-1.16	-1.62	0.28	0.113
Sleep disorders	-0.31	-1.14	0.78	0.574
Emotional problems	-0.73	-1.92	0.45	0.222
Weight gain	0.93	-0.17	2.03	0.097
Joint pain	0.30	-0.74	1.36	0.562
Other events	-0.43	-1.48	0.61	0.415
Hot flashes	1.01	-0.01	2.03	0.051
Age, years	0.037	-0.08	0.01	0.125
Time	1.15	-0.13	2.44	0.078
Self-perception of health	-0.11	-1.14	0.93	0.838
Education	-0.89	-1.19	0.20	0.109
Family organization	-1.19	-2.53	0.13	0.078
Number of live births	-1.03	-2.07	0.01	0.051
Current job	1.03	-0.01	2.07	0.051
Self-employed	0.23	-0.96	1.43	0.696
Alcohol	0.62	-0.60	1.85	0.315
Tobacco	-0.72	-1.78	0.33	0.177
Morisky				
Average adherence	1.44	0.63	2.26	0.001
Low adherence	8.13	6.09	10.17	<0.001

Captions: ARMS = Adherence to Refills and Medications Scale; CI = Confidence Interval.

to surgery and to chemotherapy and radiotherapy afterwards and 84.4% complained of treatment associated discomfort.

The women in anastrozole were more adherent when compared with tamoxifen according to the scale ARMS-12. Several studies concluded that users of tamoxifen were more nonadherent than those who took aromatase inhibitors, likely due to differences of side effects of these agents[14,21].

Women with age up to 60 years presented decline of adherence when compared to women older than 60 years, in concurrence with the study of Paranjpe et al.[22], who reported that the adherence can increase with ageing (51-69 years). Widows or singles were less adherent to the treatment with tamoxifen according to the scale ARMS-12 when compared to married or living together because social support contributes to more adherence to hormone therapy since the spouse plays a key role while offering support at the diagnosis and treatment, corroborating the findings of many studies[22-25]. The location of their residence was reported as a problem to pick up the medication; the patients who live in Great São Paulo were less adherent to tamoxifen. In the study of Blanchette et al.[26], it was found variation of the adherence rates (53% to 77%) depending on the geographical location where the patient lives in Canada similar to the present study.

The adherence declined for the women who reported not taking the medication at the same hours, possibly an obstacle due to carelessness with the time of the medication[9,15]. When the patients take the medication at the same hours of the day, the medication is linked to a settled appointment[23], corroborating the findings of the present study where women were best adherent when hormone-taking follows a settled routine. Lower adherence was found among women reporting adverse events as hot flashes, night sweats, weight gain and joints pain. Quite often, it occurs because these events negatively interfere with the quality-of-life of these women[27]. Many

studies reached the same findings, most of nonadherent women using hormone therapy reported at least one of these adverse events[21,22,25,28,29-33]. The loss of libido was noticed as not directly related to nonadherence according to ARMS. Decrease of adherence was also detected in women submitted to great number of previous treatment prior to hormone therapy with tamoxifen.

High proportion of women using anastrozole at the interview when compared to tamoxifen is possibly a limitation of the study, in addition to the sample size. Self-report was the method utilized to measure the adherence which may have overestimated the rates because of memory bias or the interviewees' responses within socially accepted patterns.

CONCLUSION

The adherence to endocrine oral therapy is an important factor to improve the results of breast cancer treatment. The intensity of the adverse events associated with tamoxifen was one of the factors associated with non-adherence when compared to anastrozole, corroborating other studies. The scale ARMS-12 appears to be a consistent tool to evaluate the adherence to hormone therapy. The results of this study can help health professionals to understand the reasons why patients with breast cancer in hormone therapy not always adhere to the treatment, which can facilitate the choice of the possible interventions.

CONTRIBUTIONS

All the authors contributed to the study design/conception, acquisition, analysis and interpretation of the data, wording and critical review. They approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

FUNDING SOURCES

None.

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Recebido em 5/5/2021
Aprovado em 13/8/2021

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