Adherence to Adjuvant Aromatase Inhibitor Therapy Among Postmenopausal Hispanic/Latino Women With Breast Cancer

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Abstract. *Aim: The purpose of this study was to determine the level of adherence to adjuvant aromatase inhibitor (AI) therapy and factors associated with non-adherence among Hispanic/Latino women with hormonal receptor-positive breast cancer (BC) treated at an academic center at the American–Mexican border city of El Paso, TX. Patients and Methods: Institutional Review Board approval was obtained in this cross-sectional study using the validated Morisky Medication Adherence Scale to assess patient adherence to AI therapy. Patients diagnosed with stage I-III hormonal receptor-positive, human epidermal growth factor receptor 2-negative BC who were on adjuvant AIs therapy were recruited from the Texas Tech University Health Sciences Center El Paso breast clinic. Results: Between September 2017 and August 2018, 122 consecutive patients were enrolled; 119 were analyzed, three were lost to follow up. The mean age was 61.6±9.4 years, and 109 (91.6%) self-identified as Hispanic/Latino. A total of 58% reported an annual income of \$15,000 or less. Overall, 40.3% had completed eighth grade or less education, 31.9% high school, and 12% had obtained a technical degree. The majority of patients (56%) had either a medium (45%) or a*

low level of adherence (11%). High adherence was noted in 44% of participants. Seven (5.6%) patients scored 2 or below on a 4-point scale for intentional adherence, and 18 (13.5%) scored 2 or below on a 4-point scale for unintentional adherence. Conclusion: These data suggest that the majority of Hispanic/Latino women with breast cancer have medium or low levels of adherence to therapy with AIs. Factors associated with medium and low adherence were unintentional (forgetfulness), but also included intentional factors, such as avoidance of adverse effects and delays with obtaining refills (cost-related nonadherence).

Breast cancer (BC) is the second leading cause of cancer death after lung cancer in the United States (1). In 2018, the American Cancer Association estimated that there were 252,700 new cases of BC in the United States and 41,000 deaths from the disease (1). It is the major type of cancer among Hispanic/Latino women in the United States, with approximately 20,000 new cases and 3,000 deaths per year (2). From 2003 to 2018, the incidence rate of BC remained stable in both Hispanic and non-Hispanic White women (2). The use of screening mammography and advances in treatment modalities including the use of adjuvant endocrine therapy have contributed to the reduction of mortality from BC in the United States by approximately 24% since 1990 (3). Multiple studies have shown substantial benefits from adjuvant endocrine therapy in improving progression-free and overall survival (4-7). For almost two decades, adjuvant endocrine therapy with an aromatase inhibitor (AI) has remained a gold-standard for patients with hormonal receptor-positive BC. In 2003, the first results of ATAC (arimidex, tamoxifen, alone or in combination) phase

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III clinical trial demonstrated a statistically significant advantage in disease-free survival among postmenopausal women initially taking anastrozole compared with tamoxifen as adjuvant therapy for hormonal receptor-positive local or locally advanced disease (6). Subsequent large clinical trials have confirmed the role of AI therapy in the management of postmenopausal women with BC and demonstrated a significant reduction of 30% in BC recurrence (5, 8-11). Despite the efficacy of AIs, it has been reported that the self-discontinuation rate is approaching 10% per year nationwide and that only 40-60% of women with BC complete 5 years of adjuvant endocrine therapy (12). There are multiple factors associated with self-discontinuation and non-adherence: cultural, limited insurance, lack of follow-up information, severity of adverse effects, older age or very young age, forgetfulness, trust in the physician and understanding of treatment recommendation. Early discontinuation can translate into a higher likelihood of relapse and shorter survival. A recent study of patients who were non-adherent (defined as omitting endocrine therapy for 180 days) showed an adjusted odds ratio for cancer recurrence of 2.88 compared to patients who did not adhere to therapy (13). Some studies have suggested a higher recurrence rate of BC among Hispanic/Latino women which might be at least partially related to early discontinuation or poor adherence rate to AI therapy (14-17). There is a paucity of studies assessing the adherence or discontinuation rate among Hispanic/Latino women and no prospective trial, to our knowledge, has addressed adherence to AI therapy among the Hispanic/Latino population.

The aim of this study was to assess the adherence rate to adjuvant endocrine therapy in patients seen at the Breast Care Center/Texas Tech University Health Sciences Center El Paso with estrogen receptor (ER)/progesterone receptor (PR)-positive BC living in the border City of El-Paso, Texas and to identify potential modifiable factors associated with AI non-adherence.

Patients and Methods

Patient population. This prospective (cross-sectional) study was approved by the Institutional Review Board of the Texas Tech University Health Sciences Center (TTUHSC), El Paso. The study population consisted predominantly from Hispanic/Latino (91.6%) women living in the border city of El Paso, Texas and treated at TTUHSC, an academic medical center. To be eligible, women had to be diagnosed with stage I-III (with no evidence of metastatic disease, M0) histologically confirmed hormonal receptor-positive (ER/PR) invasive BC and be receiving adjuvant AI therapy (anastrozole, letrozole, or exemestane) for at least 1 month. Participants were to have completed all recommended local therapies (surgery, radiation if appropriate) and have recovered from all side-effects of chemotherapy, surgery, and radiation therapy. We excluded all male patients, patients with metastatic BC and premenopausal women who had not undergone menopause either

surgically by oophorectomy or by hormonal ovarian ablation.

Patients were required to be able to complete a self-reported demographic questionnaire and the validated Morisky Medication Adherence Scale questionnaire (MMAS-8), in either English or Spanish [detailed MMAS-8 questionnaires can be found elsewhere (18, 19)]. Self-reported medication adherence was measured by the MMAS-8 (18, 19). The MMAS-8 scale consists of eight items, of which summation yields a maximum of 8 points. Level of adherence to AI therapy was categorized as high, medium, and low (18, 19).

The purpose of this study was to estimate the level of adherence to adjuvant AI therapy and the main factors associated with non-adherence among Hispanic/Latino women living in the border City of El-Paso, Texas, USA.

Pathological assessment. Pathological diagnosis, ER/PR status, and human epidermal growth factor receptor 2 (HER2)/neu status were determined by core biopsy during the initial evaluation before surgery. Standard immunohistochemical staining was used to determine hormonal receptor status. All tumors with more than 1% stained cells were considered to have a positive hormonal receptor status.

Statistical analysis. It has been shown in previous studies that the non-adherence rate to AIs range. From 20% to 75% (15, 20-27). Assuming a non-adherence rate of 30% in our population, a sample size of 89 was sufficient to produce a two-sided 95% confidence interval (CI) with a width of 20% using a Z-test. Furthermore, this sample size was more than sufficient to evaluate at least five predictors for non-adherence using multiple logistic regression analysis with more than 80% power. The sample size estimation was carried out using PASS 14 (NCSS, LLC., Kaysville, UT, USA). The medium and low adherence rate to AI therapy (<8 on MMAS-8) was estimated along with 95% CI using a Z-test. Clinical and demographic cofactors were described using appropriate summary measures such as the mean or median, and standard deviation for quantitative data, while the frequency and proportion were used for categorical data. Furthermore, non-normal data was described using median and interquartile range. A logarithmic transformation was made to induce normality for non-Gaussian data. The frequency and cumulative frequency distribution of adherence rate was summarized. Chi-squared test and one-way ANOVA were used to compare the characteristics between non-adherent and adherent groups. The unadjusted and adjusted predictors of adherence levels were assessed using linear regression models and log Poisson regression models and reported as regression coefficients and odds ratio, 95% CI and *p*-value. *p*-Values of less than 5% were considered statistically significant. All the statistical analyses were conducted using STATA 14 (StataCorp LLC, College Station, TX USA) SAS 9.4 (SAS, Cary, NC, USA) and SPSS Statistics 25 (IBM, Armonk, NY, USA).

Results

Between 2017 and 2018, a total of 122 patients were enrolled. Of these, 119 consecutive postmenopausal women with hormonal receptor-positive BC were included in this analysis. Table I shows the summary clinical profile of patients. Of these, 85 (71.4%) patients were born in Mexico, 31 (26.1%) were from the USA, and the remaining three

Table I. Clinical characteristics of the entire cohort, and by adherence levels (n=119).

Factor		Overall (n=119)	MMAS-8 Adherence level			p-Value
			High (n=52)	Medium (n=54)	Low (n=13)	
Age, years	Mean±SD	61.6 (9.4)	62.7 (9.5)	61.8 (9.4)	56.8 (8.5)	0.14
Age group, n (%)	<60 Years	50 (42.0%)	18 (36)	23 (46)	9 (18)	0.076
	≥60 Years	68 (57.1%)	34 (50)	30 (44.12)	4 (5.88)	
	Unknown	1 (0.8%)				
Years since diagnosis	Mean±SD	6.5 (3.8)	6.2 (3.9)	6.5 (3.6)	7.4 (3.7)	0.61
MMAS-8 score	Mean±SD	7.0 (1.2)	8.0 (0.0)	6.6 (0.5)	4.8 (1.2)	<0.001
Duration of AI Tx	<5 Years	43 (36.1%)	23 (53.49)	15 (34.88)	5 (11.63)	0.28
	≥5 Years	74 (62.2%)	29 (39.19)	37 (50)	8 (10.81)	
	Unknown	2 (1.7%)	0 (0)	2 (100)	0 (0)	
Breast cancer stage, n (%)	1	42 (35.3%)	19 (45.24)	18 (42.86)	5 (11.9)	0.96
	2	48 (40.3%)	20 (41.67)	23 (47.92)	5 (10.42)	
	3	27 (22.7%)	13 (48.15)	12 (44.44)	2 (7.41)	
	Unknown	2 (1.7%)				
Education level, n (%)	>8th Grade	48 (40.3%)	20 (41.67)	21 (43.75)	7 (14.58)	0.54
	HS/GED	38 (31.9%)	20 (52.63)	15 (39.47)	3 (7.89)	
	Higher education	33 (27.7%)	12 (36.36)	18 (54.55)	3 (9.09)	
Marital status, n (%)	Married	52 (43.7%)	26 (50)	21 (40.38)	5 (9.62)	0.47
	Other	67 (56.3%)	26 (38.81)	33 (49.25)	8 (11.94)	
Income, n (%)	≥\$15,000	49 (41.2%)	21 (42.86)	24 (48.98)	4 (8.16)	0.62
	<\$15,000	69 (58.0%)	31 (44.93)	29 (42.03)	9 (13.04)	
	Unknown	1 (0.8%)				
Parity, n (%)	Multiparous	98 (82.4%)	40 (40.82)	46 (46.94)	12 (12.24)	0.003
	Nulliparous	11 (9.2%)	10 (90.91)	0 (0)	1 (9.09)	
	Single	10 (8.4%)	2 (20)	8 (80)	0 (0)	
Surgery, n (%)	No	7 (5.9%)	4 (57.14)	2 (28.57)	1 (14.29)	0.65
	Yes	112 (94.1%)	48 (42.86)	52 (46.43)	12 (10.71)	
Radiation, n (%)	No	25 (21.0%)	9 (36)	12 (48)	4 (16)	0.54
	Yes	94 (79.0%)	43 (45.74)	42 (44.68)	9 (9.57)	
Smoking status, n (%)	Former	26 (21.8%)	9 (34.62)	13 (50)	4 (15.38)	0.73
	No	86 (72.3%)	41 (47.67)	37 (43.02)	8 (9.3)	
	Yes	6 (5.0%)	2 (33.33)	3 (50)	1 (16.67)	
	Unknown	1 (0.8%)	0 (0%)	1 (2%)	0 (0%)	

AI Tx: Aromatase inhibitor therapy; HS/GED: high school diploma/General Educational Development certificate; MMAS-8: Morisky Medication Adherence Scale-8; SD: standard deviation. Use of the ©MMAS is protected by US copyright laws. Permission for use is required. A license agreement is available from: Donald E. Morisky, 14725 NE 20th St Bellevue, WA 98007, USA; dmoriskiy@gmail.com or trubow1@gmail.com.

(2.5%) were classified as being from other nations (Philippines, Germany, and Nicaragua). The mean age of the patients was 61.6 ± 9.4 years. A total of 109 (91.6%) identified themselves as Hispanic/Latino, and 10 (8.4%) as other [Caucasian, African American (AA), Asian and unknown]. Overall, 58% (n=69) of patients were of low socioeconomic status, 40% (n=48) had attended elementary or middle school (≤8th grade), 32% (n=32) had obtained a high school diploma or General Educational Development certificate), and 28% (n=33) had pursued a higher education.

The average MMAS-8 score was estimated as 7±1.2 (range=1-8). Overall, low/medium adherence rate of AI was estimated as 56% (95% CI=47-65%). Patients were divided into three groups according to adherence level: High, medium, and low, in an attempt to determine factors associated with inferior (medium and low) adherence. The medium and high adherence

categories had higher numbers of participants, whereas the number in the low adherence group was smaller. We identified that a medium level and high level of adherence to AI was quite common among our patients, with 11% reporting a low level of adherence, 45% (n=54) reporting a medium adherence, and 44% reporting a high level of adherence. The intentional and unintentional subcategories of the adherence MMAS-8 model were also evaluated. The rate of intentional low/medium adherence was 26% (n=31), while the unintentional rate was 51% (n=61). In total, 25 patients had low adherence for both unintentional and intentional reasons. The answers identifying reasons for not taking their cancer therapy included: side-effects, forgetfulness, too expensive, and other reasons; forgetfulness was the highest (63%, n=75), delays in refills (5%, n=6), AEs (5%, n=6) and lack of insurance (3%, n=4). Some of the reasons listed for intentional low adherence were

Table II. Unadjusted association between cofactors and high adherence level compared to low/medium adherence level.

Factor		Adherence level		OR (95% CI)	p-Value
		High (n=52)	Low/medium (n=67)		
Years since diagnosis	Mean±SD	6.2 (3.9)	6.6 (3.6)	0.97 (0.88-1.07)	0.53
Age group, n (%)	<60 Years	18 (35%)	32 (48%)	Reference	0.13
	≥60 Years	34 (65%)	34 (51%)	1.78 (0.84-3.76)	
	Unknown	0 (0%)	1 (1%)		
Duration of AI Tx	<5 Years	23 (44%)	20 (30%)	Reference	0.14
	≥5 Years	29 (56%)	45 (67%)	0.56 (0.26-1.2)	
	Unknown	0 (0%)	2 (3%)		
Breast cancer stage, n (%)	1	19 (37%)	23 (34%)	Reference	0.73
	2	20 (38%)	28 (42%)	0.86 (0.37-1.99)	
	3	13 (25%)	14 (21%)	1.12 (0.43-2.96)	
	Unknown	0 (0%)	2 (3%)		
Education level, n (%)	>8th Grade	20 (38%)	28 (42%)	Reference	0.31
	HS/GED	20 (38%)	18 (27%)	1.56 (0.66-3.67)	
	Higher education	12 (23%)	21 (31%)	0.8 (0.32-1.99)	
Marital status, n (%)	Married	26 (50%)	26 (39%)	Reference	0.22
	Other	26 (50%)	41 (61%)	0.63 (0.3-1.32)	
Income, n (%)	≥\$15,000	21 (40%)	28 (42%)	Reference	0.82
	<\$15,000	31 (60%)	38 (57%)	1.09 (0.52-2.28)	
	Unknown	0 (0%)	1 (1%)		
Parity, n (%)	Multiparous	40 (77%)	58 (87%)	Reference	0.012
	Nulliparous	10 (19%)	1 (1%)	14.5 (1.79-117.79)	
	Single	2 (4%)	8 (12%)	0.36 (0.07-1.8)	
Surgery, n (%)	No	4 (8%)	3 (4%)	Reference	0.47
	Yes	48 (92%)	64 (96%)	0.56 (0.12-2.63)	
Radiation, n (%)	No	9 (17%)	16 (24%)	Reference	0.38
	Yes	43 (83%)	51 (76%)	1.5 (0.6-3.73)	
Smoking status, n (%)	Former	9 (17%)	17 (25%)	Reference	0.24
	No	41 (79%)	45 (67%)	1.72 (0.69-4.28)	
	Yes	2 (4%)	4 (6%)	0.94 (0.14-6.19)	
	Unknown	0 (0%)	1 (1%)		

AI Tx: Aromatase inhibitor therapy; CI: Confidence interval; HS/GED: high school diploma/General Educational Development certificate; OR: odds ratio; SD: standard deviation. Use of the ©MMAS is protected by US copyright laws. Permission for use is required. A license agreement is available from: Donald E. Morisky, 14725 NE 20th St Bellevue, WA 98007, USA; dmoriskiy@gmail.com or trubow1@gmail.com.

withholding all medications due to other health procedures, lack of insurance and tiredness. Reasons for unintentional low adherence were forgetfulness, and lack of insurance.

Table I also shows clinical characteristics of patients according to adherence level. Among all considered cofactors, the distribution of age of patients, duration of AI treatment, and parity status were found to be different across different adherence levels. Younger age, greater than 5 years of duration of AI, and multiparity seem to be associated with a low or medium adherence level.

A summary of overall adherence with respect to variables measured and age is provided in Table II using a one-way ANOVA to evaluate adherence based on two age groups (<60 and ≥60 years); there was a statistically significant mean age difference of 0.5 ($p=0.04$) between these groups. Table II shows the unadjusted association of cofactors with a high adherence level compared to combined low or medium adherence. This analysis further suggested that older

age, less duration of AI treatment, and nulliparity tended to be associated with a high adherence level. The actual mean age of the low adherence group was lower than that of the other two groups (medium and high adherence). The difference was not statistically significant; however, it is worth noting that the mean age for the low adherence group was 57 years, while that for the high adherence group was 62 years. Results from a multinomial logistic regression analysis indicate that the age group below 60 years of age was 4.25 times more likely to exhibit low adherence to AI therapy compared to the older group (≥60 years) ($p=0.03$). Furthermore, the <60 years age group was also 1.4 times more likely to have medium adherence compared to the older group ($p=0.357$).

In the adjusted analyses, only older age and a nulliparous status were more likely to be associated with a high (Table III) as well as medium (Table IV) adherence level after adjusting for education status.

Table III. *Adjusted associations of factors with high adherence level.*

Factor	OR	95% CI	p-Value
Age			
<60 Years	Reference	-	-
≥60 Years	2.03	0.88-4.65	0.095
Parity			
Multiparous	Reference	-	-
Nulliparous	23.88	2.61-218.09	0.005
Single	0.39	0.07-2.07	0.272
Education level			
>8 th Grade	Reference	-	-
HS/GED	2.02	0.80-5.10	0.137
Higher education	0.58	0.20-1.68	0.319

CI: Confidence interval; HS/GED—high school diploma/General Educational Development certificate; OR: odds ratio.

Other demographic factors such as marital status, education and income level were also evaluated in Table III. No significant associations were observed, all ORs were <1 (results not shown).

BC stage was not associated with medium and high adherence which was very similar among the three BC stages, whereas for low adherence, the relatively smaller group size across all cancer stages preclude any conclusion.

Discussion

This cross-sectional study suggests a high non-adherence rate to adjuvant AI and indicates that the majority of women surveyed (56%) reported medium or low adherence to this vital treatment. Non-adherence to adjuvant endocrine therapy is a complex and multifactorial problem that can substantially alter the outcome of medical treatment and has been associated with an increase in BC relapse, additional physician visits, higher hospitalization rates, and shorter survival (21, 28-30). Identifying modifiable causes of non-adherence is an important priority and needs to be promptly addressed (11, 31). Our findings indicate that the majority of the participants surveyed had medium or low compliance with adjuvant endocrine therapy, which is a particularly concern in the current era of trends towards minimally effective treatments, and more reliance on adjuvant endocrine therapy as opposed to previously overtreating patients with adjuvant chemotherapy. This was the result of the introduction of genomic analyses into standard care for early-stage ER/PR-positive and HER2-neu-negative BC, reducing the use of chemotherapy significantly (32). Therefore, adherence to adjuvant endocrine therapy is now ever more important for patients with BC who may rely on this treatment as the sole systemic treatment modality due to the recent evolution of modern care.

In this study we identified three main reasons for non-adherence: Forgetfulness, adverse events, and delays with getting refills (cost-related non-adherence). While forgetfulness is a quite common form of unintentional non-adherence, based on retrospective and prospective memory failure (33), we feel that this is a potentially modifiable factor, especially in view of high degree of forgetfulness in elderly patients (>50% of our patient population). Interventions to address this problem may include implementing simple measures such as cueing, chaining (associating new and established behaviors), use of social support and ancillary clinical services (family members, nurses, pharmacists), and electronic monitoring devices. For patients with a cellular device, the option to add a reminder in their calendar could be recommended by their care specialists. Physicians can help by simplifying seniors' complex medical regimens (using once-daily dosing) and discontinuing unnecessary medications. Assessment of the usefulness of a text message reminder to patients to continue their endocrine therapy is currently being studied in a randomized controlled trial (SWOG 1105/NCT01515800). Some studies have suggested more frequent follow-up visits and follow-up with specialists rather than general practitioners might have a positive impact on adherence (27). An interesting observation in our study was that patient parity was positively associated with adherence. Multiparous women were more likely to be highly adherent compared to nulliparous ones. At this point, we do not have explanations for this finding.

Reasons for non-adherence have been previously studied (17, 34-37). Multiple studies have evaluated factors correlated with non-adherence to endocrine adjuvant therapy (28, 34). Most commonly reported factors associated with non-adherence were sociodemographic factors (patient age, race and ethnicity), treatment-related factors (type of breast surgery, side-effects of chemotherapy), cost-related factors - low income, defined by Medicaid as adults with incomes up to 138% the Federal Poverty Level of \$29,435 per year for a family of three and \$17,236 per year for an individual in 2019, as well as beliefs about the benefits and risks of endocrine therapy (20, 28, 34, 37, 38).

There are limited data in modern literature addressing adherence to adjuvant endocrine therapy among women of racial/ethnic minority groups. In one retrospective, cross-sectional study, Gerber *et al.* analyzed 450 Medicare cases of patients on adjuvant endocrine therapy. They identified a statistically significant difference in adherence to endocrine therapy between African Americans (AA) and Non-Hispanic White women. More AAs reported not following their physician's instruction on how to take medications and reported early self-discontinuation (16). Another study demonstrated poor level of adherence in both AA and Hispanic/Latino women. AA and Hispanic/Latino women

Table IV. Adjusted associations of factors with high and medium adherence levels.

Factor	High vs. Low			Medium vs. Low		
	OR	95% CI	p-Value	OR	95% CI	p-Value
Age	<60 Years	Reference	-	-	-	-
	≥60 Years	5.18	1.34-19.95	0.017	3.27	0.87-12.20
Parity	Multiparous	Reference	-	-	-	-
	Nulliparous/single	4.61	0.49-43.20	0.18	2.19	0.23-20.64
Education level	>8th Grade	Reference	-	-	-	-
	HS/GED	2.67	0.57-12.60	0.213	1.75	0.37-8.19
	Higher education	1.20	0.24-6.08	0.827	1.92	0.41-9.08

CI: Confidence interval; HS/GED–high school diploma/General Educational Development certificate; OR: odds ratio.

were more likely than non-Hispanic Whites to report cost-related non-adherence (35.1%, 36.5% and 26.7%, respectively, $p<0.001$) (17). However, these studies were somewhat inconsistent, and the methodology used to gather data was not standardized, which can lead to incomplete conclusions. Our data showed slightly lower non-adherence rates compared to national and international published nonadherence data (22, 23, 25, 26, 34, 36, 39). The strengths of our analysis include the licensing and utilization of the validated 8-item MMAS-8 adherence questionnaire as described previously (18, 19, 40, 41). In addition, the average duration of adjuvant endocrine therapy was 4.3 years, which allowed for assessment of long-term adherence to therapy. Previous studies using self-reported adherence to tamoxifen or AI therapy have found that approximately 15% to 35% of women discontinue their therapy prematurely at varying lengths of follow-up (26, 34, 39). A large retrospective study in Ireland using insurance claims-based methodology reported that 22% of women had discontinued tamoxifen by the end of the first year of adjuvant therapy, and by 3.5 years, 35% had discontinued therapy (28). Hershman *et al.* retrospectively analyzed adherence of 8,769 patients with early stage BC to adjuvant endocrine therapy (tamoxifen and AI). At 4.5 years of treatment, 32% of patient had self-discontinued adjuvant endocrine therapy. Additionally, women younger than 40 years of age had the highest rate of discontinuation (hazard ratio=1.51:95% CI=1.23-1.85) (15).

Our study had several limitations. The cross-sectional design did not allow for the assessment of changes in adherence over time. However, it provided what we believe to be a good representation of adherence rates in a large cohort of Hispanic/Latino patients (91.6%), as well as information regarding some potential factors which affect adherence in this minority population which could be useful to improve adherence rates in this population. The study population was possibly limited by selection bias as patients

with the poorest adherence to therapy may not attend their clinical follow-up, and therefore may not have been captured by this study. Moreover, patient self-reported adherence rates might overestimate real-world adherence when compared to actual prescription fill rates, as shown in some studies (16, 17, 23).

In conclusion, these data suggest a low level of adherence to adjuvant endocrine therapy in the Hispanic-Latino women with BC. Factors associated with non-adherence included forgetfulness, adverse effects, and delay with obtaining refills due to cost. Appropriate education and frequent assessment of adherence and management of side-effects, combined with close monitoring with BC specialists, might help improve endocrine therapy adherence in all women with early-stage BC, including Hispanic/Latino women and other minorities.

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Conflicts of Interest

Alexander Philipovski declares that he has no conflict of interest. Aleli Campbell declares that she has no conflict of interest. Dwivedi Kumar Alok declares that he has no conflict of interest. Brenda Castillo declares that she has no conflict of interest. Heydarian Rosalinda. declares that she has no conflict of interest. Richard McCallum declares that he has no conflict of interest in medical oncology. Renato Aguilera declares that he has no conflict of interest in medical oncology. Sumit Guar declares that he has no conflict of interest. Nahleh Zeina declares that she has no conflict of interest.

Authors' Contributions

AP conceived the study and prepared the draft of the article. AC participated in drafting the article and study conception. RH participated in drafting the article and approved the article. AKD performed statistical analysis and participated in drafting the article.

RM participated in drafting the article and approved the article. RA participated in drafting and final revision of the article and approved the article. SG participated in the design of the study and approved the article. NZ conceived the study and approved the article.

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