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Attribution of menopause symptoms in human immunodeficiency virus-infected or at-risk drug-using women

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Abstract

Objective—To examine the relationship of human immunodeficiency virus (HIV) and attribution of menopausal symptoms.

Design—Peri- and postmenopausal women participating in a prospective study of HIV-infected and at-risk midlife women (the Ms. Study) were interviewed to determine whether they experienced hot flashes and/or vaginal dryness and to what they attributed these symptoms.

Results—Of 278 women, 70% were perimenopausal; 54% were HIV-infected; and 52% had used crack, cocaine, heroin, and/or methadone within the past 5 years. Hot flashes were reported by 189 women and vaginal dryness was reported by 101 women. Overall, 69.8% attributed hot flashes to menopause and 28.7% attributed vaginal dryness to menopause. In bivariate analyses, age 45 years and older was associated with attributing hot flashes and vaginal dryness to menopause, and postmenopausal status and at least 12 years of education were associated with attributing vaginal dryness to menopause, but HIV status was not associated with attribution to menopause. In multivariate analysis, significant interactions between age and menopause status were found for both attribution of hot flashes ($P = 0.019$) and vaginal dryness ($P = 0.029$). Among perimenopausal women, older age was independently associated with attribution to menopause for hot flashes (adjusted odds ratio = 1.2, 95% CI: 1.1–1.4, $P = 0.001$) and vaginal dryness (adjusted odds ratio = 1.3, 95% CI: 1.1–1.6, $P = 0.011$). None of the tested factors were independently associated with attribution to menopause among postmenopausal women.

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Conclusion—Tailored health education programs may be beneficial in increasing the knowledge about menopause among HIV-infected and drug-using women, particularly those who are perimenopausal.

Keywords

Menopause; HIV; Menopause symptoms; Attribution; Drug use

As the human immunodeficiency virus (HIV)/acquired immunodeficiency virus (AIDS) epidemic evolves, more women are becoming affected, and in 2005, an estimated 23% of the people living with AIDS in the United States were women,¹ compared with 10% in 1990.² As people with HIV are living longer and healthier lives, HIV infection is increasingly viewed as a chronic disease. As a result, many of these women will traverse menopause. Recent data suggest that an earlier onset of natural menopause may be associated with opioid use³ and HIV.^{3,4} However, information about menopause in this population is very limited.

Menopause is associated with many symptoms including vasomotor symptoms, vaginal dryness, sleep disturbances, and psychological and cognitive problems.⁵ However, hot flashes and vaginal dryness are the two symptoms most conclusively associated with a hypoestrogenic state.^{6,7} Studies in middle class and educated women found that hot flashes are more prevalent among African American women than white women.^{8–10} Studies also suggest that women infected with HIV experience a greater number of menopausal symptoms than HIV-uninfected women.^{11,12} Because menopause symptoms may come at an earlier age in HIV-infected and drug-using women,^{3,4} it is possible that the women may not be aware of the reason for the symptoms.

Thus, we performed a cross-sectional study to determine to what peri- and postmenopausal women with and at risk of HIV attribute menopausal symptoms.

METHODS

This analysis used baseline data from a prospective study titled Natural History of Menopause in HIV-Infected Drug Users (The Ms. Study) performed in the Bronx, NY. As previously described, women 35 years of age and older were recruited from methadone maintenance clinics, primary care clinics, and community flyers and by word-of-mouth between September 2001 and January 2003.³ Study enrollment was directed so that half of the participants were infected with HIV and half were uninfected, and so that 50% of the women within each of these groups were drug users. The study was approved by the institutional review boards at the Albert Einstein College of Medicine and Montefiore Medical Center. Each participant provided written informed consent and was reimbursed \$25 per visit for her time.

Standardized interviews were administered in English or Spanish by a trained staff member. Information on socio-demographic characteristics, menopause symptoms, medical and reproductive history, negative life events, perceptions of health status, physical activity, and drug use was collected. Drug use was defined as use of crack, cocaine, heroin, and/or

methadone in the past 5 years. Blood was drawn at the research visits to confirm HIV status and to measure CD4 cell count to assess the level of disease progression. Highly active antiretroviral therapy (HAART) use was defined by current guidelines.¹³

Women were queried about the occurrence of hot flashes, vaginal dryness, and dyspareunia over the past 3 months. For each reported symptom, women were asked the open-ended question “why do you think you had (symptom).” Attributions of symptoms were recorded and later grouped into the following six categories: (1) menopause, (2) drug use, (3) HIV, (4) other illness/medication, (5) other reason (other, stress/family problems, period/premenstrual, environmental), and (6) don’t know.

Menopause status was determined by self-report of menstrual bleeding patterns. Women who reported having no changes in their bleeding patterns over the past 12 months were classified as *premenopausal*. Women who reported having skipped at least one period in the past 12 months and had at least one period in the past 12 months were classified as *perimenopausal*. Women were classified as *postmenopausal* if they had not had a period in the past 12 months and had never had a hysterectomy and/or bilateral oophorectomy. Women who were premenopausal, were using hormone therapy (eg, birth control pills or hormone therapy), or had a history of hysterectomy and/or bilateral oophorectomy were excluded from this analysis.

The Center for Epidemiologic Studies Depression Scale was administered to assess depressive symptomatology,¹⁴ where a score of 23 or more suggests depression.^{15,16} Psychological stress was assessed by summing the number of negative life events experienced over the lifetime. Participants were administered the CAGE questionnaire, with a positive response to two or more items indicating alcoholism.¹⁷

Statistical analysis

This analysis focuses on peri- and postmenopausal women in the Ms. Study and their attribution of hot flashes and vaginal dryness. These symptoms were selected as they are physiologically linked to menopause-associated decreased estradiol production.^{6,7} We developed a hierarchy such that the symptom category of vaginal dryness includes and subsumes the symptom of dyspareunia. For women who reported both vaginal dryness and dyspareunia, the attribution of the combined vaginal dryness category was coded as the original attribution of vaginal dryness. In cases in which women reported dyspareunia and not vaginal dryness, the attribution code of dyspareunia was used.

Bivariate associations between participant characteristics and attribution were assessed using the χ^2 test. Logistic regression models were constructed to test the independent association of factors with the attribution of hot flashes to menopause and separately with the attribution of vaginal dryness to menopause. In addition, separate models were constructed among peri- and postmenopausal women, respectively, to look at the attribution of hot flashes and of vaginal dryness to menopause. The following variables were included in each of the models: age (continuous by year), menopause status (peri vs post), HIV infection (yes vs no), drug use in past 5 years (yes vs no), level of education (<12 y vs ≥ 12 y), and race/ethnicity

(Hispanic vs black or other race/ ethnicity vs black). An additional model was constructed for HIV-infected women to assess the relationship of CD4 cell count and HAART use, adjusting for the other risk factors. These data were analyzed using SPSS 13.0 for Windows.

RESULTS

Characteristics of participants

Of the 620 women enrolled in the Ms. Study, 194 perimenopausal and 84 postmenopausal women were included in this analysis. Fifty-four percent of the women were infected with HIV and 52% had used crack, cocaine, heroin, and/or methadone within the past 5 years. The overall mean ($\pm$ SD) age was 47.1 ± 5.25 years; the mean age of perimenopausal women was 45.5 ± 4.13 years, and the mean age of postmenopausal women was 50.9 ± 5.67 years.

Participant characteristics stratified by menopause status are listed in Table 1. Compared with perimenopausal HIV-infected women, postmenopausal HIV-infected women were more likely to have a CD4 cell count of less than 200 cells/mm³ ($P = 0.003$), despite a similar prevalence of HAART use (60.4% and 61.0%, respectively).

Attribution of menopause symptoms

Of the perimenopausal women, 139 (71.6%) reported having hot flashes as did 50 (59.5%) of the postmenopausal women. Vaginal dryness was reported by 75 (38.7%) perimenopausal women and 26 (31.0%) postmenopausal women. There was no difference in the prevalence of hot flashes or vaginal dryness by HIV status.

Hot flashes

Of the 189 women who reported experiencing hot flashes, 69.8% of women attributed these symptoms to menopause. Ninety-three (66.9%) perimenopausal women and 39 (78%) postmenopausal women attributed their hot flashes to menopause. Overall, 11.1% of women reported that they did not know why they had hot flashes, which broke down as 13.7% of perimenopausal and 4.0% of postmenopausal women. Although there was no difference in attribution to menopause among HIV-infected versus HIV-uninfected women (70.3% vs 69.3%, respectively), there seemed to be a difference among the women who said “don’t know” (16.8% of HIV-infected women vs 4.5% of HIV-uninfected women, $P = 0.007$). Hot flashes were attributed to HIV by 5% of HIV-infected women and to drug use by 9.6% of women who had used crack, cocaine, and/or heroin in the past 6 months.

Table 2 describes the frequency of attribution of hot flashes to menopause by a number of participant characteristics among the 189 women who reported experiencing hot flashes. A higher proportion of women aged 45 years and older attributed their hot flashes to menopause than women younger than 45 years ($P < 0.001$). A higher proportion of women with a Center for Epidemiologic Studies Depression Scale score of less than 23 attributed hot flashes to menopause than women who scored 23 or more on the Center for Epidemiologic Studies Depression Scale (75.7% vs 62.8%, respectively), which approached statistical significance ($P = 0.054$).

Vaginal dryness

Of the 101 women who reported vaginal dryness, 28.7% attributed the symptom to menopause and 37.6% reported that they did not know why they had vaginal dryness. Postmenopausal women were more likely to attribute their vaginal dryness to menopause than perimenopausal women (46% vs 23%, $P = 0.023$). Vaginal dryness was attributed to drug use by 3.1% of the participants who had used crack, cocaine, and/or heroin in the past 6 months and to HIV by 10.2% of HIV-infected women.

Table 3 describes the frequency of attribution of vaginal dryness to menopause by a number of participant characteristics among the 101 women who reported experiencing vaginal dryness. Factors significantly associated with attribution to menopause included postmenopausal status ($P = 0.023$), age 45 years or older ($P < 0.001$), and at least 12 years of education ($P = 0.008$).

Among the 78 women with both hot flashes and vaginal dryness, 67.9% attributed hot flashes to menopause. Women who attributed hot flashes to menopause also attributed vaginal dryness to menopause at a higher frequency compared with women who did not attribute hot flashes to menopause (37.7% vs 12.0%, respectively, $P = 0.02$). Moreover, the percentage of women attributing hot flashes to menopause was higher among women who attributed vaginal dryness to menopause than among women who did not attribute vaginal dryness to menopause (87% vs 60%, respectively, $P = 0.02$).

Multivariate analysis

We did separate logistic regression analyses of attribution of hot flashes to menopause as the outcome, using all participants who reported hot flashes, and then separate models among peri- and postmenopausal women. In the model among all participants, older age was a statistically significant predictor of attribution to menopause (adjusted odds ratio [OR_{adj}] = 1.1, 95% CI: 1.0–1.2, $P = 0.001$) adjusting for menopause status, HIV infection, drug use in past 5 years, level of education, and race/ethnicity. However, there was an interaction between age and menopause status ($P = 0.019$). Therefore, we constructed separate models for peri- and postmenopausal women. In these models, older age was independently associated with attribution of hot flashes to menopause among perimenopausal women ($OR_{adj} = 1.2$, 95% CI: 1.1–1.4, $P = 0.001$) (Table 4), but not among postmenopausal women ($OR_{adj} = 1.0$, 95% CI: 0.9–1.1, $P = 0.78$).

A model among all participants who reported vaginal dryness revealed that older age and having at least 12 years of education were independently associated with attribution of vaginal dryness to menopause ($OR_{adj} = 1.1$, 95% CI: 1.0–1.3, $P = 0.046$; $OR_{adj} = 3.2$, 95% CI: 1.2–8.8, $P = 0.022$, respectively). In addition, HIV-infected women were almost half as likely as HIV-uninfected women to attribute vaginal dryness to menopause ($OR_{adj} = 0.4$; 95% CI: 0.1–1.1, $P = 0.064$). This model also revealed an interaction between age and menopause status ($P = 0.029$), so we constructed separate models by menopause status. In the model among perimenopausal women, older age was independently associated with attribution of vaginal dryness to menopause ($OR_{adj} = 1.3$, 95% CI: 1.1–1.6, $P = 0.011$) as was at least 12 years of education ($OR_{adj} = 2.9$, 95% CI: 0.8–10.3, $P = 0.11$) (Table 5).

There were no significant factors associated with attribution of vaginal dryness to menopause among postmenopausal women.

In a model limited to HIV-infected women, neither HAART use nor CD4 cell count was independently associated with attribution of hot flashes or vaginal dryness to menopause.

DISCUSSION

In this sample of HIV-infected or at-risk drug-using women, we found that two thirds of women attributed their hot flashes to menopause and one third attributed vaginal dryness to menopause. Three factors emerged as being significantly associated with attribution to menopause: older age, postmenopausal status, and at least 12 years of education. Although we originally hypothesized that women infected with HIV would differ from women at risk of HIV, this was not observed here. The association with education is consistent with the possibility that health education programs to increase knowledge about menopause may be especially helpful for HIV-infected and drug-using women when tailored to those with less than high school education.

We found a statistically significant interaction of age with menopause status and a nonsignificant trend toward an interaction of education with menopause status for attribution of both hot flashes and vaginal dryness. Subsequent stratification by menopausal status revealed that age and education were predictors of attribution only for those who were perimenopausal. This is plausible because women who are younger may not consider even the possibility that they are menopausal despite skipping periods, whereas older women may be more likely to think of themselves as in a menopausal age and the appearance of symptoms would not then be unexpected. Thus, the older women would be more likely to attribute these classic symptoms to menopause.

Women with HIV and drug-using histories may not perceive themselves as menopausal, particularly if they are going through menopause at an earlier age than is generally accepted (ie, 50–51 y).¹⁸ Data from this prospective cohort (the Ms. Study) and the Women's Interagency HIV Study indicate that HIV is associated with an earlier age at natural onset of menopause (ie, 47–48 y).^{3,4} Given this earlier age at onset, symptoms may begin many years before the final menstrual period, which may explain why the women in our sample did not know why they were experiencing these symptoms.

It is quite striking that more than 70% of the women did not attribute vaginal dryness to menopause and that 37% of the women did not know why they had the symptom. Studies on access to menopause information are extremely scarce; one study published in 2000 reported that 100% (n = 12) of high school-educated African American women had no source of menopause information compared with 47% (n = 15) of high school-educated white women.¹⁹ With no available information, it is impractical to expect women to know to what their symptoms are related and to seek treatment. If vaginal dryness goes untreated, it can lead to vaginal infections, dyspareunia, lack of desire,²⁰ and decreased sexual satisfaction.²¹ Furthermore, some findings have suggested that vaginal dryness may make HIV-uninfected women more susceptible to HIV,^{22,23} although other studies have not found such an

association.^{24,25} Thus, it is important to inform women about vaginal dryness and its relationship with menopause, its potential for HIV transmission, and how it can be effectively treated with vaginal moisturizers and lubricants.

We found that a greater proportion of HIV-infected women reported that they did not know why they had hot flashes or vaginal dryness than HIV-uninfected women (16.8% vs 4.7%, $P = 0.007$; 44.1% vs 28.6%, $P = 0.11$, respectively). Women with HIV experience many comorbid conditions related to drug use, medication toxicities, and frequent lack of primary health care. This may increase the likelihood that they would consider that the symptoms were due to other health problems. Alternatively, HIV-infected women may consider hot flashes and vaginal dryness as inconsequential relative to HIV and ignore them despite not knowing what caused the symptoms.

Women who do not attribute menopause symptoms to menopause are less likely to initiate conversations about menopause with their health care providers. Our results also suggest that health care providers of HIV-infected women and drug users may not ask or educate them about menopause. Without recognition and attribution of menopause, the likelihood that women will benefit from available treatments is low. Short-term hormone treatment at the time of menopause seems to carry fewer risks than long-term treatment of postmenopausal women and has been endorsed by several evidence-based panels.^{26,27} Nonhormonal therapies (ie, selective serotonin reuptake inhibitors, selective norepinephrine reuptake inhibitors, clonidine, gabapentin), although overall less effective, have also demonstrated evidence of efficacy.²⁸

We found that only a minority of women who had used crack, cocaine, and/or heroin in the past 6 months attributed hot flashes and vaginal dryness to drug use (9.6% and 3.1%, respectively). The women in this cohort had extensive histories of heroin and cocaine use, both current and past use.²⁹ As a result, they may have been more likely to distinguish menopausal symptoms from the hot sweats and cold sweats that opioid addicts, for example, experience when in withdrawal, even if many of the women did not know to what to attribute the menopausal symptoms per se. Limitations This study has several

limitations

The cross-sectional design makes it difficult to know whether these findings are consistent over time and whether the associations are causal. Although menopause status is usually determined by self-report of menstrual bleeding patterns, this may have led to incorrect assessment of menopause state among active drug users.³⁰ However, a recent analysis of this cohort showed that the self-report of bleeding patterns correlated with reproductive hormone levels.³¹ It is possible that some of the hot flashes and vaginal dryness may have been caused by something other than menopause (eg, drug use, medication); however, given that women in this sample were either perior postmenopausal, it is most likely that these were a result of menopause. The fact that the study sample was narrowly defined as drug users and women with and at risk of HIV, all of whom shared similar socioeconomic status, limits generalizability. However, we believe that this is a strength of the study because these findings are essential for shedding light on the menopausal experiences of underserved,

vulnerable populations about which there is a paucity of information. Finally, the sample size was small, which may have limited the ability to detect some effects. We believe that this was appropriate because this was an exploratory study, and it has provided the preliminary data to warrant larger studies in women with very low socioeconomic status, including women at low risk of HIV infection.

CONCLUSIONS

Many women in this population did not attribute their hot flashes or vaginal dryness to menopause, and a meaningful subset did not know why they were experiencing these symptoms. Tailored health education programs may be beneficial for increasing the knowledge about menopause among HIV-infected and drug-using perimenopausal women. In addition, health care providers who treat HIV-infected or drug-using women need to be cognizant of the lack of knowledge about menopause and initiate conversations with their patients so that treatment of menopause symptoms and its sequelae can be addressed.

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TABLE 1

Characteristics of study participants by menopause status

Characteristic	Perimenopause (n = 194), n (%)	Postmenopause (n = 84), n (%)
History of HIV infection	101 (52.1)	49 (58.3)
Drug use in past 5 y	100 (51.5)	43 (51.2)
Age 45 y ^a	108 (55.7)	75 (89.3)
12 y of education	92 (47.4)	34 (40.5)
Race		
Black	94 (48.4)	34 (40.5)
Hispanic	64 (33.0)	35 (41.6)
White	24 (12.4)	12 (14.3)
Mixed/other	12 (6.2)	3 (3.6)
Marital status		
Single/never married	55 (28.4)	21 (25.0)
Married/living together	79 (40.7)	28 (33.3)
Separated/divorced/widowed	60 (30.9)	35 (41.7)
Employed part time or more	39 (20.1)	13 (15.5)
Receives public benefits	158 (81.4)	75 (89.3)
Pregnancies (n = 262)		
1–3	53 (28.5)	32 (42.1)
4–6	84 (45.1)	32 (42.1)
7–10	39 (21.0)	10 (13.2)
11	10 (5.4)	2 (2.6)
CD4 cell count ^a		
501	49 (48.5)	14 (28.6)
201–500	43 (42.6)	21 (42.8)
200	9 (8.9)	14 (28.6)
Uses HAART	61 (60.4)	30 (61.2)
Smoking		
Never	19 (9.8)	9 (10.7)
Former	46 (23.7)	21 (25.0)
Current	129 (66.5)	54 (64.3)
CAGE score 2	78 (40.2)	26 (31.0)
Negative life events		
0	11 (5.7)	8 (9.5)
1–2	51 (26.3)	31 (36.9)
3–5	98 (50.5)	38 (45.2)
6	34 (17.5)	7 (8.3)
CES-D score 23	76 (39.2)	36 (42.9)
Body mass index		
<25	60 (30.9)	26 (30.9)

Characteristic	Perimenopause (n = 194), n (%)	Postmenopause (n = 84), n (%)
25–29.99	48 (24.7)	22 (26.2)
30–34.99	38 (19.6)	14 (16.7)
35	48 (24.7)	22 (26.2)

HIV, human immunodeficiency virus; HAART, highly active antiretroviral therapy; CES-D, Center for Epidemiologic Studies Depression Scale.

^aP < 0.05

TABLE 2

Attribution of hot flashes to menopause among those who reported having hot flashes (n = 189)

Characteristic	Attributed to menopause, n (%)	P
Menopausal status		0.14
Perimenopausal	93 (66.9)	
Postmenopausal	39 (78.0)	
HIV status		0.88
Positive	61 (69.3)	
Negative	71 (70.3)	
Drug use in past 5 y		0.72
Yes	68 (68.7)	
No	64 (71.1)	
Age, y		<0.001
<45	31 (52.5)	
45	101 (77.7)	
Education, y		0.86
<12	76 (70.4)	
12	56 (69.1)	
Race		0.39
Black	63 (74.1)	
Hispanic	45 (62.5)	
White	17 (73.9)	
Mixed/other	7 (77.8)	
Marital status		0.26
Single/never married	30 (62.5)	
Married/living together	57 (76.0)	
Separated/divorced/widowed	45 (68.2)	
Employed part time or more		0.86
Yes	27 (71.1)	
No	105 (69.5)	
Receives public benefits		0.74
Yes	111 (69.4)	
No	21 (72.4)	
Pregnancies (n = 179)		0.94
1–3	38 (69.1)	
4–6	53 (67.9)	
7–10	25 (73.5)	
11	8 (66.7)	
CD4 cell count (n = 101)		0.23
501	29 (63.0)	
201–500	30 (73.2)	
200	12 (85.7)	

Characteristic	Attributed to menopause, n (%)	P
HAART use (n = 101)		0.36
Yes	47 (73.4)	
No	24 (64.9)	
Smoking		0.49
Never or former	44 (66.7)	
Current	88 (71.5)	
CAGE score		0.35
0–1	76 (67.3)	
2	56 (73.7)	
Negative life events		0.85
0	8 (66.7)	
1–2	32 (65.3)	
3–5	70 (72.2)	
6	22 (71.0)	
CES-D score		0.054
<23	78 (75.7)	
23	54 (62.8)	
Body mass index		0.74
<25	43 (72.9)	
25–29.99	33 (73.3)	
30–34.99	27 (67.5)	
35	29 (64.4)	

HIV, human immunodeficiency virus; HAART, highly active antiretroviral therapy; CES-D, Center for Epidemiologic Studies Depression Scale.

TABLE 3

Attribution of vaginal dryness symptoms to menopause among those who reported having vaginal dryness (n = 101)

Characteristic	Attributed to menopause, n (%)	P
Menopausal status		0.023
Perimenopausal	17 (22.7)	
Postmenopausal	12 (46.2)	
HIV status		0.079
Positive	13 (22.0)	
Negative	16 (38.1)	
Drug use in past 5 y		0.40
Yes	13 (25.0)	
No	16 (32.7)	
Age, y		<0.001
<45	2 (5.3)	
45	27 (42.9)	
Education, y		0.008
<12	11 (18.6)	
12	18 (42.9)	
Race		0.51
Black	17 (32.7)	
Hispanic	10 (29.4)	
White	1 (10.0)	
Mixed/other	1 (20.0)	
Marital status		0.96
Single/never married	8 (29.6)	
Married/living together	13 (29.5)	
Separated/divorced/widowed	8 (26.7)	
Employed part time or more		0.15
Yes	8 (42.1)	
No	21 (25.6)	
Receives public benefits		0.40
Yes	23 (27.1)	
No	6 (37.5)	
Pregnancies (n = 179)		0.96
1–3	8 (32.0)	
4–6	12 (26.7)	
7–10	6 (30.0)	
11	2 (33.3)	
CD4 cell count (n = 101)		0.58
501	7 (22.6)	
201–500	3 (15.8)	

Characteristic	Attributed to menopause, n (%)	P
200	3 (33.3)	
HAART use (n = 101)		0.60
Yes	6 (19.4)	
No	7 (25.0)	
Smoking		0.82
Never or former	12 (30.0)	
Current	17 (27.9)	
CAGE score		0.59
0–1	19 (30.6)	
2	10 (25.6)	
Negative life events		0.93
0	1 (16.7)	
1–2	6 (28.6)	
3–5	15 (29.4)	
6	7 (30.4)	
CES-D score		0.43
<23	17 (32.1)	
23	12 (25.0)	
Body mass index		0.96
<25	9 (27.3)	
25–29.99	7 (25.9)	
30–34.99	7 (31.8)	
35	6 (31.6)	

HIV, human immunodeficiency virus; HAART, highly active antiretroviral therapy; CES-D, Center for Epidemiologic Studies Depression Scale.

TABLE 4

Logistic regression model predicting the attribution of hot flashes to menopause among perimenopausal women (n = 139)

Covariates in the model	Adjusted OR	95% CI	P
Older age (per year)	1.2	1.1–1.4	0.001
HIV infection (vs no)	1.0	0.5–2.3	0.92
Drug use in past 5 y (vs no)	1.0	0.5–2.3	0.94
Hispanic (vs black)	0.8	0.4–1.9	0.64
Other race (vs black)	1.7	0.5–5.5	0.37
12 y education (vs <12 y)	1.6	0.8–3.6	0.21

OR, odds ratio; HIV, human immunodeficiency virus.

TABLE 5

Logistic regression model predicting the attribution of vaginal dryness to menopause among perimenopausal women (n = 75)

Covariates in the model	Adjusted OR	95% CI	P
Older age (per year)	1.3	1.1–1.6	0.011
HIV infection (vs no)	0.5	0.1–1.8	0.26
Drug use in past 5 y (vs no)	1.0	0.2–3.8	0.97
Hispanic (vs black)	0.7	0.2–3.1	0.66
Other race (vs black)	0.7	1.0–4.4	0.66
12 y education (vs <12 y)	2.9	0.8–10.3	0.11

OR, odds ratio; HIV, human immunodeficiency virus.