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Dyspareunia is Associated with Decreased Frequency of Intercourse in the Menopausal Transition

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Abstract

Objective—Frequency of sexual intercourse declines as women enter mid-life. While partner availability and function likely play a role, menopausal symptoms, such as vaginal dryness, are also present. We examine the associations among vaginal dryness, dyspareunia, and frequency of sexual intercourse.

Methods—In the second year of a longitudinal study, women completed questionnaires that included menopausal status and symptoms, participation in sexual activities, dyspareunia, marital status, and race. We used univariable and multivariable ordered logistic regression models to examine the associations among the frequency of sexual intercourse, vaginal dryness, use of lubrication during sex, and dyspareunia.

Results—In multivariable analyses of the 363 sexually active women with complete data, women reporting more frequent dyspareunia, but not vaginal dryness, also reported less frequent intercourse. Advancing menopausal status was associated with lower frequency of intercourse, while age was not. Dyspareunia and vaginal dryness were only moderately correlated ($r=.4$)

Conclusions—Women continue to participate in sexual intercourse through mid-life. Women who report dyspareunia, but not vaginal dryness report less frequent intercourse. Relief of dyspareunia should be addressed to maintain sexual functioning during mid-life.

Keywords

Menopause; sexual function; dyspareunia; sexual intercourse

Introduction

Sexual dysfunction is highly prevalent among American women, especially in middle age. Between 43 and 63 percent of U.S. women report problems with sexual functioning.^{1–3} Understanding the causes of sexual dysfunction during menopause is important, given the advancing age of the American population and the negative effect of sexual dysfunction on

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health-related quality of life.^{3, 4} Furthermore, determining the causes of sexual dysfunction during menopause and their relative contribution can help define treatments for it, which is particularly important if they are treatable with methods other than hormone replacement therapy.

Multiple studies have shown that women report more sexual problems with increasing age.^{1, 5–11} However, less clear are the causes of this decrease in function. Researchers have attempted to disentangle the contribution of factors such as increasing age, menopausal status, fluctuations in hormone levels, psychosocial factors, and more. Evidence thus far has been mixed and has reinforced what we already suspected: the causes of the decline in female sexual function throughout middle age are many, varied, complex, and interrelated. The transition from premenopausal to peri- and postmenopausal has been associated with decreasing sexual function independent of age in the vast majority of studies.^{1, 3, 7–10, 12–15} Yet menopausal status alone does not tell the whole story, and age is consistently a stronger predictor. Several researchers have emphasized the important contribution of relationship status (such as attitudes toward partner, lack of partner, or partner sexual dysfunction)^{1, 14, 16–19} and psychosocial factors (i.e. mental health, education level, socioeconomic status),^{1, 3, 10, 16, 20} which trumped the effect of menopausal status on sexual function in one study.¹²

The decrease in circulating estradiol, characteristic of menopause, is associated with vaginal dryness and atrophy.^{8, 21} Between 17 and 55 percent of middle-aged women complain of vaginal dryness^{11, 22–29} and reports of vaginal dryness increase five-fold as women advance through menopause.³⁰ Unlike vasomotor symptoms, which eventually resolve, vaginal dryness and dyspareunia become more prominent with both advancing age and menopausal status and rarely improves.^{1, 7, 9, 18, 20, 23, 24, 29, 31, 32}

While mid-life women and their partners may engage in a variety of sexually intimate activities, in this paper we explore the associations among vaginal dryness, dyspareunia, and frequency of sexual intercourse. We hypothesize that: 1) more vaginal dryness would be associated with decreased frequency of sexual intercourse, 2) dyspareunia would be associated with decreased frequency of sexual intercourse, 3) lubricant use would mitigate the impact of vaginal dryness and dyspareunia on frequency of sexual intercourse, and 4) vaginal dryness would be associated with dyspareunia and use of lubricant during intercourse.

Methods

This investigation was part of a larger study examining the impact of menopause on health-related quality of life, described previously.³³ Briefly, 732 women ages 40–65 were enrolled between January and November, 2005 from a single general internal medicine practice. All women who were in this age range, spoke English, and consented to participate were enrolled in the study. The study population includes women who are surgically menopausal and women using or who have used hormone therapy.

As part of this study, women complete annual questionnaires. These include information regarding demographic characteristics (such as race, marital status, and educational attainment), menopausal status, menopausal symptoms (i.e., vaginal dryness and hot flashes), medical comorbidities, and hormone therapy use. During the second year of study (2006) women also answered questions related to sexual functioning including lubricant use, frequency of intercourse, and pain with intercourse. Participants completed all questionnaires either in person using Internet-enabled computers, remotely via the Internet, or with a trained interviewer over the telephone.

Menopausal status was assigned on the basis of self-reported bleeding patterns using a previously described modification of the Stages of Reproductive Aging Workshop classification.^{33–35} Women were considered premenopausal if they experienced regular menstrual periods; early peri-menopausal if they had irregular bleeding patterns but last menstrual period (LMP) occurred within the last 3 months; late peri-menopausal if their LMP was between 3 and 12 months ago; early postmenopausal if their LMP was between 12 months and 5 years ago; and late postmenopausal if LMP was more than 5 years ago. Women who reported a hysterectomy or were taking oral contraceptive pills could not be classified by bleeding pattern and were placed into separate groups not based on bleeding patterns or menopausal status. We did not collect information about oophorectomy status. Women, except those taking oral contraceptive pills, reported the presence of vaginal dryness on a 5-point scale ranging from “never” to “all of the time”.

Women were asked if they had engaged in any sexual activity (including kissing hugging, oral sex and sexual intercourse) with a partner in the prior 6-months. Women who answered “yes” were considered sexually active. Sexually active women reported the frequency of intercourse, our primary outcome variable, on a 5-point scale ranging from “not at all” to “daily”. Women who reported any sexual intercourse were also asked to report dyspareunia and lubricant use on a 5-point scale ranging from “never” to “always”. Women who reported engaging in any partnered sexual activities were not asked about partner sexual limitations.

Participant characteristics were summarized using frequencies and means. We used univariable and multivariable ordered logistic regression models were to examine the associations among vaginal dryness, use of lubrication, dyspareunia, and frequency of sexual intercourse. Other covariables, listed above and in Table 1, with univariable significance of $p < 0.25$ were considered for entry into the multivariable models. All multivariable models were adjusted for age, marital status, race, and menopausal status. We calculated the correlation between vaginal dryness and dyspareunia, vaginal dryness and lubricant use, and dyspareunia and lubricant use using the Pearson’s correlation coefficient. These analyses were limited to women who reported engaging in sexual intercourse with a partner in the last 6-months.

Results

Of the 677 women who completed questionnaires in the second year of the study, 459 (68%) reported having engaged in any sexual activity (ranging from hugging and kissing to intercourse) with a partner (either a man or a woman) in the last 6 months. Of these sexually active women, 391 of the 459 (85%) reported having any sexual intercourse. Three hundred sixty-three of these 391 (93%) women completed all of the questions on dyspareunia, lubricant use, and vaginal dryness and serve as the analysis group; 27 women were not asked about vaginal dryness based on questionnaire design and 1 woman did not answer the question about dyspareunia. When compared to the entire study population ($n=677$), sexually active women were significantly more likely to report vaginal dryness ($p = 0.005$).

Among these 363 women, the average age was 52.3 years (Table 1). The majority of the sample was white and of non-Hispanic ethnic origin. The majority of women in the sample had completed some higher education, with 37% holding a graduate degree or higher. Women were distributed across the spectrum of menopausal statuses and most were not current users of hormone therapy.

Compared to pre-menopausal women, early and late postmenopausal women reported less frequent intercourse (Odds Ratio (OR) (95% Confidence Interval (CI)): .4 (.2–.8) and .5 (.3–.9), $p=.01$ and .02, respectively). We found no difference in the frequency of intercourse

based on self-reported vaginal dryness. Compared with women who reported no pain with intercourse, those who reported pain with intercourse almost always or always also reported less frequent intercourse (OR (CI): .1 (.04–.5) and .2 (.06–.8), respectively). There is a suggestion that lubricant use is associated with more frequent intercourse (OR (CI): 2.0 (.97–4.0) and 1.7 (.9–3.1, for almost never and sometimes compared to never), respectively). (Table 2) We found only a moderate correlation between vaginal dryness and dyspareunia ($r=0.4$), vaginal dryness and lubrication use ($r=0.5$), and dyspareunia and lubricant use ($r=0.3$).

The results of the multivariable analysis are outlined in Table 2. Briefly, we found that women in the early post menopause continued to report less frequent intercourse compared with premenopausal women (OR (95% CI): .4 (.2–.9), $p=.02$). Women who reported pain with intercourse almost always or always continued to report less frequent intercourse (OR (95% CI): .2 (.04–.6) and .2 (.05–.8), $p=.005$ and .02, respectively). Finally, compared with women who never used lubricants, using lubricants almost never or sometimes was associated with more frequent intercourse (OR (95% CI): 2.3 (1.1–4.9) and 2.3 (1.2–4.4), $p=.03$ and .01, respectively). Because of the moderate correlations among vaginal dryness, dyspareunia, and lubricant use, and thus concern about confounding based on unmeasured vaginal dryness, we placed vaginal dryness back into multivariable models. Results were statistically unchanged (data not shown).

Discussion

Dyspareunia and vaginal dryness are common complaints in mid-life women. About one-third of women in our population experience pain with sexual intercourse at least sometimes. Notably, about one in 10 women report dyspareunia “always” or “almost always.” Vaginal dryness was even more common, with almost half of women report having dryness at least some of the time, and 25% of women have dryness “most” or “all of the time.”

This sample of women reported a broad range in frequency of sexual intercourse. About half of women reported sexual intercourse once or twice a month, while the other half reported intercourse at least once per week; only 2% of women in this sample report having daily intercourse. These statistics are consistent with previous reports of intercourse in middle-aged women.^{12, 16} Self-reported lubricant use with sexual intercourse was common, with about a third of women using lubricant “almost always” or “always,” although nearly half of women reported “never” using supplemental lubrication. This rate of lubricant use is higher than that found by Patel, although this may be due to the population studied as all of our women were engaging in sexual intercourse.³⁶

Many of the characteristics that have been previously associated with sexual functioning were not associated with frequency of sexual intercourse in our study. However, our population is a group of women who reported partnered sexual activity in the last 6 months, not women in general. In our group of women who engaged in any sexual intercourse, age, race, marital status, education level, and medical comorbidities did not correlate significantly with frequency of intercourse. Consistent with prior work, advancing menopausal status was associated with decline in frequency of sexual intercourse, with women in early or late postmenopause reporting less frequent sexual intercourse than premenopausal women.

Use of lubricant was also significantly associated with differences in frequency of intercourse. Women using lubricant reported higher frequency than those using never. Interestingly, women using lubricant more frequently (“almost always” or “always”) showed

little difference in frequency of intercourse compared to “never” users. Perhaps women who are never using lubrication are having pain with sex and therefore avoiding it, while in the always-users the constant need for lubrication signifies more severe dryness and therefore a tendency to decreased frequency of intercourse. Another hypothesis is that openness to using lubrication some of the time, but not “always” or “never,” signifies a certain flexibility and adaptability in sexual practices that allows for increased enjoyment and therefore greater frequency of intercourse.

Consistent with our hypothesis, we did see an association between dyspareunia and frequency of sexual intercourse. While there was no difference in frequency of intercourse between women reporting pain “never” and “almost never,” reporting dyspareunia “sometimes,” “almost always” or “always” was associated with a decline in frequency of intercourse. We did not, however, find an association between vaginal dryness and frequency of sexual intercourse. It is notable that sexually active women were more likely to report vaginal dryness than women who were not sexually active with a partner in the prior 6 months. It may be that women who were engaging in partnered sexual activity were more likely to notice vaginal dryness.

Vaginal dryness and dyspareunia are not interchangeable in this sample of women. While significantly correlated, the correlation coefficient is only 0.4 in our study. This indicates that these are two constructs that, while related, are not necessarily identical and cannot be substituted for one another in research or clinical practice. It may be that some women do have dyspareunia as a result of vaginal atrophy, but this atrophy is not necessarily experienced by the woman as a sensation of “dryness.” It is also possible that women who experience dryness are mitigating it with lubricant use and therefore not having pain with sex.

This study does not take into account women’s prior sexual functioning, specifically, prior frequency of sexual intercourse. For instance, we do not know whether the women were experiencing dyspareunia prior to middle age that affected their sexual function. Pain with sex is a common complaint even among younger women,^{37, 38} and it is possible that the dyspareunia reported in this study was not a new pain associated with vaginal atrophy or any other menopausal factor but pain with intercourse that they had been having previously by a different route. This highlights the importance of taking prior sexual function into account when discussing sexual function of a woman in the climacteric. In fact, Dennerstein et al. found prior sexual function to be the most important contributing factor to sexual functioning during menopause.²¹

The results of this study differ from a recently published analysis that found women with sexual dysfunction were 3.8 times more likely to report vulvovaginal atrophy than those without sexual dysfunction. However, they defined vaginal atrophy relatively broadly, including women who reported vaginal dryness, itching, irritation, pain with urination, pain with intercourse, or bleeding with intercourse.³⁹ We found that vaginal dryness and pain with intercourse are related but not equivalent. The increase in sexual dysfunction they found may be more related to dyspareunia from other causes than from vaginal atrophy.

There are several limitations to this analysis. This is a sample that reflects the demographics of a select group of women seeking care at one clinic. Specifically, the majority of the sample was white. While we controlled for characteristics such as race, ethnicity, and educational status, some groups were underrepresented in this sample. This may reflect that we selected out a subgroup of women who were reporting sexual activity in the previous month.

This study did not use a validated scale to describe sexual function in this population. In lieu of a specific sexual functioning score, we used frequency of sexual intercourse. While easy to conceptualize, this is only a rough measure of sexual function in middle-aged women. Women may be enjoying other types of sexual interaction in place of intercourse. This may be even more likely in women who report vaginal dryness and/or dyspareunia. We are not able to distinguish between deep and insertional dyspareunia. The survey used in this analysis is all based on self-report, which may be subject to bias, particularly with a sensitive topic such as sexual activity. Further, women who were sexually active were not asked about sexual dysfunction in their partner. Middle-aged women may have middle-aged male partners that have sexual dysfunction, which would contribute to a decreased frequency of intercourse.

Our data are cross-sectional, and therefore causality cannot be determined. Women may be having less sex because they have dyspareunia, or women may be getting dyspareunia from having less sex. The latter has been suggested by a “use it or lose it” model, i.e., increased frequency of sexual intercourse seems to be protective against vaginal atrophy. A longitudinal analysis would be able to tell us more about the causes of decreased frequency of intercourse. Longitudinal analysis would also make it easier to control for prior sexual function, which, as mentioned above, is important. This particular study did not examine the importance of sexual interaction or sexual intercourse to middle-aged women. Future studies would benefit from examining the amount of distress caused by decreased frequency of sexual activities, particularly intercourse, among middle-aged women, as some women may not be bothered by less frequent intercourse.

Conclusions

Both vaginal dryness and dyspareunia are commonly reported problems in middle-aged women. Dyspareunia but not vaginal dryness is associated with decreased frequency of sexual intercourse during the climacteric. Further study is necessary to elucidate how dyspareunia affects sexual function over the course of the menopausal transition and the direction of this relationship.

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Table 1

Demographic, Menopausal, and Sexual Intercourse-Related Characteristics of sexually active STRIDE women (n=363)

Characteristic	n(%)
Age (Mean (SD), range)	52.3 (6.2), 41–67
Race	
White	288 (79.3)
African American	61 (16.8)
Asian	8 (2.2)
Native American	2 (0.6)
Other	4 (1.1)
Ethnicity (non-Hispanic)	356 (98.1)
Marital Status	
Single	41 (11.3)
Married/committed relationship	276 (76.0)
Divorced	39 (10.7)
Widowed	7 (1.9)
Educational Attainment	
High school or less	45 (12.4)
Some college	88 (24.2)
Completed college	97 (26.7)
Graduate degree	133 (36.6)
Number of comorbid conditions	
0	120 (33.1)
1–2	185 (51.0)
3 or more	58 (16)
Menopausal status	
Premenopausal	94 (25.9)
Early perimenopausal	55 (15.2)
Late perimenopausal	26 (7.2)
Early postmenopausal	64 (17.6)
Late postmenopausal	60 (16.5)
Hysterectomy	64 (17.6)
Current Hormone Therapy use (yes)	30 (8.3)
Frequency of sexual intercourse	
Once or twice a month	173 (47.7)
About once per week	107 (29.5)
More than once a week	76 (20.9)

Characteristic	n(%)
Daily	7 (1.9)
Pain with intercourse	
Never	172 (47.4)
Almost never	74 (20.4)
Sometimes	83 (22.9)
Almost always	18 (5.0)
Always	16 (4.4)
Vaginal dryness	
Not at all	147 (40.5)
Rarely	51 (14.1)
Some of the time	73 (20.1)
Most of the time	52 (14.3)
All of the time	40 (11.0)
Lubricant use	
Never	169 (46.6)
Almost never	28 (7.7)
Sometimes	48 (13.2)
Almost always	48 (13.2)
Always	70 (19.3)

Table 2

Odds of Reporting Increased Frequency of Sexual Intercourse on a 5-point Scale Ranging from 1: not at all to 5: daily.

Characteristic	Univariable Models			Multivariable Models		
	OR (95% CI)*	p-value	overall p-value	OR (95% CI)	p-value	
Age (continuous)	0.98 (0.95–1.0)	0.3		1.0 (1.0–1.1)		0.5
Race						
White (referent)	1			1		
Non-white	1.3 (0.8–2.1)	0.3		1.3 (0.8–2.2)		0.3
Marital Status			1.0			
Single (referent)	1			1		
Married/committed relationship	1.0 (0.6–1.9)	0.9		0.8 (0.4–1.6)		0.5
Divorced	0.9 (0.5–1.7)	0.7		0.7 (0.4–1.5)		0.4
Widowed	1.1 (0.2–5.2)	0.9		1.3 (0.3–6.5)		0.7
Educational Attainment			0.4			
High school or less (referent)	1					
Some college	1.7 (0.8–3.5)	0.2				
Completed college	1.1 (0.6–2.3)	0.7				
Graduate degree	1.3 (0.6–2.5)	0.5				
Number of comorbid conditions			0.7			
0 (referent)	1					
1–2	0.8 (0.5–1.3)	0.4				
3 or more	0.9 (0.5–1.6)	0.7				
Menopausal status			0.07			
Premenopausal (referent)	1			1		
Early perimenopausal	0.8 (0.4–1.5)	0.5		0.7 (0.1–1.3)		0.3
Late perimenopausal	0.6 (0.2–1.3)	0.2		0.5 (0.2–1.2)		0.1
Early postmenopausal	0.4 (0.2–0.8)	0.01		0.4 (0.2–0.9)		0.02
Late postmenopausal	0.5 (0.3–0.9)	0.02		0.4 (0.2–1.1)		0.07

Characteristic	Univariable Models			Multivariable Models		
	OR (95% CI)*	p-value	overall p-value	OR (95% CI)	p-value	
Hysterectomy	0.7 (0.4–1.3)	0.3		0.7 (0.3–1.4)	0.3	
Current Hormone Therapy use						
Yes (referent)	1					
No	0.7 (0.3–1.4)	0.3				
Pain with intercourse			<.001			
Never (referent)	1			1		
Almost never	1.0 (0.6–1.7)	0.9		1.0 (0.6–1.7)	1.0	
Sometimes	0.7 (0.4–1.1)	0.1		0.6 (0.4–1.1)	0.08	
Almost always	0.1 (0.04–0.5)	0.003		0.2 (0.04–0.6)	0.005	
Always	0.2 (0.06–0.8)	0.02		0.2 (0.05–0.8)	0.02	
Vaginal dryness			0.6			
Not at all (referent)	1					
Rarely	0.9 (0.5–1.5)	0.6				
Some of the time	0.9 (0.5–1.6)	0.8				
Most of the time	1.2 (0.7–2.1)	0.6				
All of the time	0.6 (0.3–1.2)	0.2				
Lubricant use			0.1			
Never (referent)	1			1		
Almost never	2.0 (1.0–4.0)	0.06		2.3 (1.1–4.9)	0.03	
Sometimes	1.7 (0.9–3.1)	0.08		2.3 (1.2–4.4)	0.01	
Almost always	0.9 (0.5–1.7)	0.8		1.2 (0.6–2.3)	0.7	
Always	1.0 (0.6–1.6)	0.9		1.6 (0.9–3.0)	0.1	

* OR: Odds Ratio, 95% CI: 95% Confidence Interval