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The effect of menses on standardized assessment of sexual dysfunction among women with uterine fibroids: a cohort study

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Abstract

Objective—To determine if assessment of sexual dysfunction by the Female Sexual Function Index (FSFI) is related to whether the FSFI is administered during or between menses in women with symptomatic uterine fibroids

Design—Prospective cohort

Setting—US academic medical centers

Patients—Premenopausal women with symptomatic uterine fibroids enrolled in fibroid treatment trials

Interventions—FSFI administered during and between menses

Main Outcome Measures—FSFI mean scores in each of 6 domains and a discordance score to report individual differences in assessment

Results—Thirty-three women completed the FSFI during menstruation and at a time in their cycle when they were not menstruating. The mean FSFI scores for each domain did not differ based on when in the menstrual cycle the instrument was administered. However, on an individual level, nearly half of the women reported sexual dysfunction differently during menses than between menses. Of those that differed, pain and desire domains improved; lubrication, and satisfaction worsened during menses.

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Clinical Trial Registration: ClinicalTrials.gov NCT00995878

Conclusions—Although the mean values of the domain scores were not different, women did report differences in sexual functioning between menses and non-menses reporting. Timing of the questionnaire in relation to menses should be considered in sexual dysfunction assessment for women with uterine fibroids.

Keywords

leiomyoma; fibroid; sexual function; FSFI

Background

Sexual dysfunction has been linked to uterine fibroids (1–3). Women with fibroids report 40% higher frequency of mild dyspareunia and an 80% higher frequency of moderate to severe dyspareunia than women without fibroids (3). They also report higher pain scores during intercourse and lower satisfaction scores than women without fibroids. Sexual dysfunction scores have been reported to improve after myomectomy (2). In a multinational study, 42.9% of women reported that fibroids negatively affected their sexual life (1), and in a recent U.S. based survey, up to 60% of African American women felt that fibroids affected their sex life (4). However, few studies have used validated instruments to assess sexual function in women with fibroids, and no studies have examined the effect that menses, which often are heavy or prolonged with this disease, have on sexual dysfunction.

The Female Sexual Functioning Index (FSFI) has emerged as a highly accepted, validated instrument (5, 6). The advantages of the FSFI are that it utilizes self-report, focuses on female sexual health, can be completed in 10–15 minutes, and can reliably distinguish between normal sexual function and dysfunction (5). It allows investigation into six domains of sexual functioning including pain and has been used successfully in other medical conditions.

Studies using the FSFI demonstrate the menstrual cycle's effect on women's perception of sexual functioning. Salonia *et al.* evaluated sexual functioning in women with Type 1 diabetes and non-diabetic control women during the follicular and luteal phases of the menstrual cycle (7). They found a significant difference in sexual functioning for the diabetic women compared with the controls during the luteal phase, but no difference in the groups during the follicular phase. Decreased sexual functioning has also been shown to be related to increasing menstrual irregularity among women with type 2 diabetes (8).

Our objective was to determine if the assessment of sexual function in women with uterine fibroids is influenced by administration of the FSFI during her menses or between menses. In women with symptomatic uterine fibroids, we hypothesized that the heavy and prolonged periods would likely result in lower sexual functioning and higher pain scores if recorded during menses.

Methods

Our cohort draws baseline data from subjects in a randomized controlled trial (RCT) and a parallel observational study. The FIRSTT trial (Fibroid Interventions: Reducing Symptoms

Today and Tomorrow) is an NIH-funded RCT comparing magnetic resonance guided focused ultrasound surgery (MRgFUS) to uterine artery embolization (UAE) for the treatment of fibroids (clinicaltrials.gov NCT00995878,) (9). Participants were recruited from two of the three FIRSST trial sites including Mayo Clinic (Rochester) and Duke University. Enrollment criteria included premenopausal women of at least 25 years old with symptomatic uterine fibroids that had not undergone a prior myomectomy and had a uterus smaller than 20 weeks gestational size (9). Women meeting the same enrollment criteria that underwent either fibroid treatment but declined randomization were also followed in a parallel observational study. All women had pre-procedure MR imaging on which total fibroid number was counted and screening for eligibility for both MRgFUS and UAE was performed. Uterine size was measured in three planes, and total uterine volume was calculated using the elliptical formula. Both groups of women complete multiple structured questionnaires regarding uterine fibroid and pelvic symptoms (9). The FSFI is the validated measure used for evaluation of sexual dysfunction (6). The participants completed the questionnaire during menses and between menses (non-menses assessment) as a part of their baseline (pretreatment) cycle. Only women who completed the FSFI questionnaire at both time points were included. Institutional review boards at each site approved the study. Our hypothesis for this study was that for women with uterine fibroids, a validated measure of sexual function would vary based on when it was administered in the menstrual cycle.

The FSFI is a 19-item questionnaire that screens sexual function in 6 domains: desire, arousal, lubrication, orgasm, satisfaction, and pain (6). Questions were scored on a 5-point Likert scale within each domain with the option of “no sexual activity” for four of the domains (arousal, lubrication, orgasm, and satisfaction). The answers were tallied within each domain and weighted by the number of questions in that domain (6). Mean weighted scores are presented. The mean scores and standard deviations for each domain were calculated and compared by menses status with a paired t-test using STATA 10.0 (StataCorp, College Park, TX).

A discordance score for each woman was calculated as the difference between the menses and non-menses assessment for each domain. These scores were categorized into no change, improvement or worsening using the non-menses administration of the questionnaire as the reference. An improved score would indicate that the domain (e.g. satisfaction) was better at the time of menses than non-menses. The amount of change between assessments differed for the domains based on the range in scoring possible for each domain.

Results

Sixty-three women were enrolled at the time of this analysis, and 33 women had completed FSFI both during menses and between menses (23 from the randomized arm and 10 from the observational study). Women in the observational study were frequently treated within days of study entry so that both menses and non-menses questionnaires could be completed before treatment. Our cohort did not significantly differ from the overall participants in the trial (data not shown). The women ranged in age from 34 to 52, with a mean of approximately 44 years (Table 1). Thirty-two percent were nulligravid and 40% nulliparous. On average, women had 4.1 fibroids with a mean calculated uterine volume by MRI of

approximately 651 cm³. Mean FSFI scores ranged from 2.71 in the desire domain to 3.92 in the lubrication domain. Total FSFI scores were 19.7 for the menses assessment and 19.6 for the non-menses assessment. When we excluded women who answered no sexual activity or intercourse in at least 2 domains (n=9), total scores were to 25.1 and 24.4, respectively.

There were no significant differences in mean scores for each of the six domains between menses and non-menses assessments in paired analyses (Table 2). Mean scores within each domain changed by less than 0.2 points between the two assessments. However, when comparing the responses between the FSFI administered at menses with the FSFI administered at a non-menses time for each woman, there were differences in sexual function seen in specific domains.

Using the discordance score, approximately half of the scores remained the same in each domain except arousal (Table 3). Of those that differed, more women reported improvement in the desire (33.3%) and pain (30.3%) domains during menses than reported worsening at menses (15.2% reported worsening in desire and 9.1% in pain domains). On the contrary, more women reported worsening at the time of menses in the lubrication (33.3%) and satisfaction (39.4%) domains than improvement (18.2% for lubrication and 21.2% for satisfaction). Of the half that showed a change between assessments in the orgasm domain, similar proportions of women reported improvement and worsening. In the arousal domain, nearly one-third remained unchanged, one-third improved and slightly more than one-third worsened. The median differences for improvement or worsening varied by domain, with desire and pain changing the least at 1–1.5 points. Lubrication, satisfaction, and arousal changed between 1.5 and 3 points between assessments. The orgasm domain showed the greatest variability with a median improvement of 3 points at menses and worsening of 4.5 points at menses. Correlations between tests ranged from 0.67 to 0.86. However, wider ranges of scores were documented in the domains (all except desire) that allow an answer of ‘no sexual activity’; women who reported high scores for the domain at one assessment and then no sexual activity at the second assessment could have a difference in score of up to 15 points.

Discussion

Our study demonstrated that FSFI results may vary based on timing of instrument administration on an individual level, which is not reflected in the mean scores. Although most women reported no change in pain or desire, the discordance scores that differed surprisingly demonstrated improvement in both desire and pain at the time of menses for women with fibroids. In our cohort of women with symptomatic fibroids, heavy bleeding and dysmenorrhea were common, and we hypothesized that pain during intercourse may be significantly higher around the time of menses. Pain has been shown to be significantly greater in women with fibroids than women without fibroids (2), but assessment was not done at different times in the menstrual cycle in that study.

Discordance scores also demonstrated worsening in the lubrication and satisfaction domains at the time of menses. Previous studies of the effect of menstrual cycles on sexual function are limited, but support that sexual functioning assessment may vary with menstrual cycle.

Among women with type I diabetes, sexual dysfunction was greater than control women when assessed during the luteal phase, but not the follicular phase; the finding was attributed to lower testosterone and higher progesterone in diabetic women than their control counterparts (7). Similarly, Nappi et al found that FSFI mean scores were lower in arousal and orgasm during early postmenopausal stage, when estradiol and testosterone were lower (10). In their study, higher estradiol was linked to lower pain in the perimenopause stage. In a study of women with multiple sclerosis, hormone levels were not correlated with FSFI scores despite having a high percentage of both abnormal hormone values and sexual dysfunction (11).

Fibroids may be associated with lower sexual functioning (12). When compared with the FSFI validation study (6), the mean scores in each domain for the women in our study were very similar to women with female sexual arousal disorder (FSAD). The pain score in our study was lower, indicating more reported pain, than the FSAD patients in that study (unweighted scores were 8.3 in our study versus 10.1 in FSAD patients) (6). In addition, the total scores of 19.7 and 19.6 are well below the cut-off score of 26.55 to differentiate women with and without sexual dysfunction (13). In a prior study by Ertunc *et al*, women with fibroids had lower pain, satisfaction and total FSFI scores than women without fibroids (2). The FSFI scores in our participants were slightly lower in all domains, except satisfaction, than the fibroid cohort from that study (2). Also supporting our findings, 20–25% of women report that fibroids negatively affect their sexuality or sense of femininity (1, 4). Results were similar in a multinational study; 24% reported pain during sexual intercourse compared with 9% of women without fibroids (1).

It is difficult to estimate the clinical importance of the difference in our discordance scores given the median changes ranging from 1–4.5 points. When compared to the mean differences per domain in discriminant analyses of the FSFI, mean differences in the range of 1.19 to 3.51 points were able to discriminate between different sexual disorders (13). In addition, our test-retest correlations are lower than those in the control group but higher than those from the female sexual arousal disorder group from the original validation study (6).

The highest ranges of difference in discordance came when a person would report no sexual activity at one assessment and highly positive sexual function at the next assessment. For instance, a person with a discordance of 15 points in the pain domain meant that she reported no pain during intercourse at one assessment (a score of 15) and no sexual activity at the next (a score of zero). How to score the lack of sexual activity has been debated (6, 14). Not having intercourse can be multi-factorial, including lack of interest, discomfort from symptoms related to fibroids or menses, or simply, partner not being available. If the inactivity was related to the fibroids, then it is important to score these as zero; but if the inactivity was unrelated to fibroids, than a zero score will result in large differences between assessments. Therefore, we categorized the discordance into generalized improving or worsening, including the sexual inactivity as a zero, but did not rely on the absolute difference. The relatively high number of women reporting no sexual activity during our study period contributes to our lower mean scores as well. Even when we excluded women who reported no sexual activity, the mean scores were still below the cut-off of 26.55.

While we believe our study to be the first to use a discordance score as well as mean scores to evaluate the effect of menstrual cycles on sexual function, our study is not without limitations. Our cohort includes women with symptomatic uterine fibroids who were seeking treatment and thus may not be generalizable to a broad population of women with fibroids. However, it was recently shown that sexual dysfunction is frequent in a population of women with symptomatic fibroids, even when not seeking treatment (4). Second, the lack of statistical significance in mean scores could be due to small numbers. However, the differences seen between the mean scores would not be clinically relevant, even if statistically different. We had some variability in the timing of non-menses assessment, but only 4 women did not do the assessments within the same month. For the non-menses assessment, we had an equal number of women complete the FSFI questionnaire in the follicular and luteal phases, which may influence outcomes. Future studies may benefit from standardization of timing of the questionnaire during the menstrual cycle.

Conclusion

The assessment of sexual dysfunction may vary with the menstrual cycle, an important finding in all reproductive women but especially women with gynecologic conditions, such as fibroids. Using discordance scores may increase the chance of finding these differences.

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Table 1**Participant and uterine characteristics**

<i>Participant characteristics</i>	
Age (years), mean $\pm$ SD	43.9 $\pm$ 4.8
Body mass Index (kg/m ²), mean $\pm$ SD	28.7 $\pm$ 5.6
Gravida, N (%)	
0	10 (32.3)
1	4 (12.9)
2	5 (16.1)
3	5 (16.1)
4	5 (16.1)
5+	2 (6.5)
Missing	2
Para, N (%)	
0	12 (40.0)
1	5 (16.7)
2	9 (30.0)
3	3 (10.0)
4+	1 (3.3)
Missing	3
<i>Uterine characteristics</i>	
Mean fibroid number, mean $\pm$ SD	4.1 $\pm$ 3.8
Mean total fibroid volume (cm ³), mean $\pm$ SD	313.6 $\pm$ 242.8
Mean uterine volume (cm ³), mean $\pm$ SD	650.6 $\pm$ 454.4

Table 2

Paired analyses of mean scores per Female Sexual Function Index domain

Domains	Menses	Non-menses	p-value
	Mean (SD)	Mean (SD)	
Desire	2.82 (1.18)	2.71 (1.05)	0.3
Arousal	3.01 (1.93)	2.95 (2.12)	0.8
Lubrication	3.80 (2.43)	3.92 (2.56)	0.6
Orgasm	3.13 (2.39)	3.12 (2.34)	1.0
Satisfaction	3.43 (2.01)	3.56 (1.85)	0.5
Pain	3.49 (2.66)	3.31 (2.60)	0.5
Total	19.7 (11.0)	19.6 (11.3)	0.9

Table 3

Discordance of Female Sexual Function Index scores for specific domains at menses compared with non-menses assessment

	No Change	Improved at Menses	Worsened at Menses
	N (%)	N (%)	N (%)
Desire	17 (51.5)	11 (33.3)	5 (15.2)
Arousal	10 (30.3)	11 (33.3)	12 (36.4)
Lubrication	16 (48.5)	6 (18.2)	11 (33.3)
Orgasm	16 (48.5)	9 (27.3)	8 (24.2)
Satisfaction	13 (39.4)	7 (21.2)	13 (39.4)
Pain	20 (60.6)	10 (30.3)	3 (9.1)