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Measuring Menstrual Discomfort: A comparison of interview and diary data

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Abstract

Background—Menstrual discomfort is common among women of reproductive age and can be debilitating. The accuracy of self-report of menstrual discomfort is unknown.

Methods—At enrollment into the DES Reproductive Health Study, 1990, premenopausal women classified their frequency of any menstrual discomfort as “always”, “often”, “sometimes” and “never”. Subsequently, women provided daily diary information for up to six months regarding any menstrual discomfort and medication for menstrual pain.

Results—324 women contributed 4 menstrual cycles to the prospective study. At enrollment, 10% had reported “never” having menstrual discomfort. Of these, 65% recorded at least one day of menstrual discomfort during follow-up. For the 27% who had reported “always” having discomfort, 88% recorded discomfort in all cycles. The enrollment statement of discomfort was more strongly correlated with the percent of cycles in which women took medication for menstrual pain: respondents who said they “never” had menstrual discomfort reported use of pain medication in 3% of cycles; “sometimes,” 36%, “often,” 67%, and “always,” 92%. The average number of days per cycle with prospectively-recorded menstrual discomfort was also correlated with the enrollment response.

Conclusions—A single question regarding frequency of menstrual discomfort was positively correlated with prospectively recorded menstrual discomfort, and especially with pain requiring medication.

Keywords

Dysmenorrhea; Reproducibility of Results; Pain measurement; Questionnaires; Menstrual Cycle

Menstrual discomfort is common in women of reproductive age and may be related to mental, physical and emotional health problems.¹ Menstrual discomfort frequency or

intensity is typically assessed through women's self-report. The accuracy of self-report of menstrual discomfort in a questionnaire or an interview is unknown. Specifically, how well does a generalized self-report collected at a single time point reflect a woman's day-to-day experience of menstrual discomfort? Women may tend to overestimate their menstrual discomfort due to the common stereotype that menstruation is painful,^{2,3} or because of a general human tendency to exaggerate pain experiences.⁴ Negative emotions (such as depression and stress) at the time of any type of pain may intensify pain recall, leading to over-estimation.^{5,6} Alternatively, women may under-report their pain simply because they forget. Some authors hypothesize that pain that is new or acute may be better remembered than pain that is recurring, as menstrual pain tends to be.⁷ Another report suggested that people who rate their health higher tend to under-report chronic health conditions.⁸ Thus, women who consider themselves "healthy" may tend to under-report their recurring menstrual discomfort.

The causes of menstrual discomfort are not fully understood. Women's reports of the presence of menstrual pain have been correlated with concurrent circulating vasopressin and prostaglandin metabolite levels.⁹ Similarly, prostaglandin metabolites are higher in endometrial tissue¹⁰ or menstrual fluid¹¹⁻¹³ of women with dysmenorrhea compared to women without pain. When women are treated with prostaglandin synthesis inhibitors, they report reduced premenstrual or menstrual symptoms, including pain.^{14,15} Decreases in intrauterine pressure after ibuprofen treatment have also been associated with decreases in reported pain severity among dysmenorrhea patients.¹⁶

Two studies have reported consistency in women's assessment of premenstrual and menstrual symptoms from one cycle to the next over two consecutive cycles.^{17,18} This suggests that cycles tend to be similar and that characterization of subjective menstrual symptoms is repeatable.

Our purpose was to compare women's summaries of their menstrual discomfort reported at enrollment with the frequency of any menstrual discomfort reported in a subsequent daily diary.

Materials and Methods

The study population was recruited from the daughters of women who participated in a randomized trial of diethylstilbestrol (DES) during pregnancy in Chicago from 1950 to 1952. The daughters had been informed of their prenatal DES status. Details regarding recruitment, enrollment, and data collection are provided elsewhere.¹⁹ Briefly, the daughters of the trial participants were interviewed by telephone in 1990 (at ages 37-39). The telephone interview collected information on demographic, anthropometric, medical, reproductive and menstrual characteristics.

Eligibility for a prospective study of menstrual cycles was determined during this interview. Women were ineligible if they were currently pregnant, breastfeeding, using oral contraceptives or other hormones, if they had undergone a hysterectomy, or had been through menopause. During the enrollment telephone interview, women were asked:

“Approximately, how often do you have cramps or backache with your menstrual periods? Would you say never, sometimes, often or always?”

Those who were eligible and agreed to participate were sent a six-month daily menstrual diary divided into weeks; women returned each week's data at the end of the week. In the daily diary women reported any bleeding or spotting, and were asked to “Tell us about backache, cramps, or pain that you have with your period or ovulation.” Women were also asked if there were “ANY drugs taken for menstrual pain, including aspirin or Tylenol.” Three-hundred fifty-eight women contributed at least one menstrual cycle in the prospective study. One woman did not answer the enrollment question, leaving 357 women in the analysis.

In the subsequent diary study, a woman was considered to have experienced discomfort in a given cycle if she reported any menstrual backache or cramps (with or without medication) at least once starting five days prior to the onset of menstrual bleeding and extending through the first five days of menses (“menses window”). This restricted window ensured that the opportunity to experience discomfort during menses was not dependent on the length of menses. If any day was missing during this interval, menstrual discomfort was also treated as missing for that cycle, unless there was at least one day of pain reported on another day during the window. In that case, the cycle as a whole was treated as “with discomfort;” however, it was missing for the analyses of the number of days of pain within the window. If the woman reported taking medicine for pain, but did not specifically report menstrual discomfort, that day was considered to have had pain. The number of menses windows with discomfort divided by the total number of observed menstrual cycles yielded the proportion of cycles with any menstrual discomfort. Because this proportion may not be well-estimated with a small number of cycles, we limited this analysis to women with at least four prospectively observed menstrual cycles. This left 324 women for the proportion of cycles with discomfort analysis and 313 women in the number of days of pain analysis.

We compared the observed proportion of cycles with discomfort with the participants' self-report of the frequency of menstrual discomfort. To describe agreement between the two sources, we divided women into four categories according to the proportion of their cycles with pain: zero, more than zero but less than 0.5, at least 0.5 but less than 1.0, and 1.0. These four categories were compared with the enrollment classifications of “never,” “sometimes,” “often,” and “always” by means of a weighted kappa coefficient. To determine the sensitivity of our categorization, we varied the cutpoint between the middle two categories from 0.3 to 0.7.

We also compared the woman-average number of days with discomfort during each menses window with the questionnaire-reported frequency of menstrual discomfort (limited again to women with at least four cycles).

A previous analysis of this cohort found no differences in menstrual discomfort between women exposed to DES compared to women who were not exposed.¹⁹ We carried out all analyses for both groups combined, but checked the main results for consistency between the two types of women.

The DES Reproductive Health study was approved by the National Institutes of Health institutional review board and all participants gave their informed consent to participate in the study.

Results

Fifty-four percent of diary participants had a college degree, 93% were white, 67% had normal (<25) body mass index, and 53% had never smoked. The frequency of discomfort across the menstrual cycle peaked on the first and second days of bleeding, with more than half of all cycles having discomfort on those two days (Figure 1).

Of the 324 women who contributed at least four cycles, 7% recorded no days of discomfort during any of their menstrual windows. Among women who had reported at enrollment that they “never” experience menstrual discomfort, 35% reported no menstrual discomfort during the prospective study; this was the highest proportion of the four subgroups (Figure 2). Only 6% of women who said they never experienced discomfort recorded discomfort in more than half of their observed cycles. Women who reported “sometimes” experiencing menstrual discomfort had a wide range of discomfort in their diaries: 22% had discomfort in less than half their cycles while 35% had discomfort in all of their cycles. Among women who reported “often” experiencing menstrual discomfort, 72% recorded discomfort in all of their cycles, while among women who reported “always” experiencing menstrual discomfort, 88% recorded discomfort in all of their cycles. These patterns were consistent between DES exposed and unexposed women.

Of the 1512 cycles with at least 1 day of recorded discomfort, two-thirds (1043) included at least 1 day of medication use for menstrual pain (59 cycles were missing medication information). When we restricted the analysis to menstrual pain that was accompanied by the use of pain medication, there was a stronger gradient with a woman's initial report at enrollment. Among women who reported “never” having discomfort, only 3% experienced at least one day of menstrual pain with medication use in at least half their cycles. This proportion increased to 36%, 67% and 92% among women who said they “sometimes,” “often,” and “always” had discomfort.

The overall kappa for agreement between the retrospective and prospective categorizations of menstrual discomfort was 0.35 (data not shown). When we varied the cutpoint between the prospective categories of “sometimes” and “often,” the kappa ranged from 0.32 to 0.40. When we restricted to medicated pain in the prospective study, kappa was stronger and less variable (0.45 to 0.46).

For women who reported at enrollment that they “never” had discomfort, the average number of days of discomfort during the menses window was 0.3 (data not shown). This increased to 1.5 days among women who reported at enrollment that they “sometimes” had discomfort, 2.6 days for women who reported “often,” and 3.6 days for women who reported “always”.

We conjectured that a woman's interview report of menstrual discomfort may depend on the time elapsed since her most recent menses. We explored this by examining the time between

the last menstrual period and the telephone interview, assessing whether the timing of the interview was related to her reported frequency of menstrual discomfort at enrollment. There was no difference in the proportions of women reporting “never,” “sometimes,” “often,” and “always” having menstrual discomfort (data not shown).

Discussion

Women's responses to a single question about frequency of menstrual discomfort generally correlated with subsequent prospectively-recorded frequency of discomfort. Almost all the women in this study recorded some menstrual discomfort, even if they had initially reported “never” having menstrual discomfort. Similarly, it was not uncommon for women who said they “sometimes” experienced discomfort to report at least one day of discomfort in all of their recorded cycles. This suggests a tendency to underreport the frequency of menstrual discomfort.

Women who reported more frequent discomfort at enrollment were also more likely to report more days of discomfort in each menses window. This could suggest some overlap in women's ideas of “frequency” of discomfort and “duration” of discomfort. Alternatively, duration of discomfort may be associated with severity of discomfort, which in turn is associated with the woman's conception of “frequency” of discomfort.

Our findings are not consistent with the results of Woods et al.²⁰ who found a tendency for women age 18 to 35 to overstate their symptoms. In that study, 73 women filled out daily diaries for two months and afterwards were asked to complete the Moos Menstrual Distress Questionnaire (asking about menstrual cramps and premenstrual backache during their most recent menstrual period).²⁰ While there was general agreement between prospective recording and reporting on the post-diary questionnaire, the symptoms rating was higher on the questionnaire compared with daily diary responses. It may be that keeping a menstrual diary before the questionnaire had sensitized these women to the later questions about their menstrual symptoms. Two other studies of similar structure also found that young women tended to over-report their premenstrual symptoms when asked to recall them retrospectively^{21,22}. Furthermore, women who believed premenstrual syndrome to be common tended to over-report more dramatically²¹. This is consistent with the findings of McFarland et al. who found that among a group of women aged 17-31 the more a woman believed in the concept of “menstrual distress” the more she over-reported the negativity of her menstrual symptoms at the previous menses²³. One study asked women aged 18-41 to retrospectively characterize their premenstrual symptoms prior to a daily diary study of one menstrual cycle. The retrospective reports over-estimated the symptoms reported during the daily diary.²⁴

In another study, 40 college students were asked to predict their menstrual pain daily during menses.⁴ The level of pain predicted each morning was higher than the level reported at the end of the day. Women were also asked a week later to report their peak menstrual pain. Recall over-estimated the prospective report. (For a review of the assessment tools for menstrual cycle symptoms, see Haywood, et al.²⁵)

In contrast a study of 49 women found a slight underreporting of the intensity of dysmenorrheal pain two weeks after the onset of menses compared with measurements taken during the episode.²⁶

These studies involve small samples and only one or two cycles per woman, whereas our study included 324 women and at least 4 cycles per woman. Additionally, most of these studies focused on younger women, while our population was older (37-39 years). Finally, several of these studies assessed menstrual and premenstrual symptoms broadly rather than pain or discomfort specifically. Such studies may reflect a tendency of women to over-report menstrual symptoms (including negative mood or irritability) while reports of pain or discomfort might be more consistent. Variability in the intensity of pain may be associated with overestimation of recalled pain.²⁷ Unfortunately we were unable to assess this in our data as we did not have a measure of intensity of menstrual discomfort.

Our study is limited by the age range of our participants. Our study sample comprised the offspring of women enrolled in a clinical trial, all of whom were 37 to 39 years of age at interview. Thus, our results may not be generalizable to women of other ages. Furthermore, these women may be more aware of their reproductive characteristics because of their involvement with the trial. (We did not, however, find any differences in reporting by DES exposure itself.) It is possible that the women in our study are the most vigilant participants from the DES trial (67% of the daughters were interviewed, 83% of those eligible for the menstrual study participated). If the participants in our study were selected for their vigilance, this study may suggest better consistency in reporting than would be found in a random sample of the population. One advantage of this population, however, is that selection for the study was not based on the woman's prior experience with menstrual discomfort. This allows for greater variability in menstrual discomfort frequency. Another limitation of the study is that neither the enrollment questionnaire nor the daily diary directly queried severity of menstrual discomfort. Finally, we did not evaluate the validity of discomfort reporting because there was no gold standard for comparison.

Menstrual discomfort is a relatively common occurrence among reproductive age women, and its causes are not well understood. There are currently no methods to measure or quantify menstrual discomfort biologically, and we must rely on women's reports to describe it. If women can accurately describe their menstrual symptoms in a single questionnaire, then clinical trials investigating effects on menstrual discomfort would have less need for baseline prospective data collection, which may lower research costs and improve participation rates.²⁸ We found that a single question about frequency of menstrual discomfort was predictive of several measures of discomfort in prospective records, while diary data provided a more detailed depiction of the pattern of discomfort experience.

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Figure 1.

Proportion of cycles with prospectively recorded pain on each day relative to cycle day one, n=357 women, DES Reproductive Health Study, 1990.

Figure 2.

Distribution of the proportion of cycles in which at least one day of menstrual pain was reported, stratified by the self-reported frequency of menstrual pain reported at enrollment, n=324 women who contributed 4 prospective cycles, DES Reproductive Health Study, 1990.