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Delivery in patients with dyspareunia—A prospective study

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ABSTRACT

Objective: Despite the high prevalence of dyspareunia, published data focused on childbirth is scarce. This study aimed to evaluate the prevalence of dyspareunia in a random primiparae parturient population, characterize their features, and describe associated perinatal outcomes.
Study design: In this prospective observational study we approached primiparous women admitted to our labor ward. Women were asked to complete an interview, based on self-report of dyspareunia symptoms. Obstetrical outcomes were obtained and compared between women with (exposed) and without (controls) dyspareunia. Midwives completed a questionnaire regarding patients' cooperation, pain level, pelvic floor hypertonicity, difficulty with vaginal examinations and perceived anxiety level.
Results: One hundred seventy-three women completed a detailed questionnaire querying dyspareunia symptoms. Of them, 41.6% (n = 72) reported a certain degree of dyspareunia. Exposed women did not differ in demographic or clinical characteristics as compared to controls. Of the exposed group, 40.3% reported primary dyspareunia, 25.4% secondary dyspareunia, and 34.3% could not recall its beginning. Only 34.3% had consulted a practitioner regarding this problem. Rates of vaginal deliveries, vacuum deliveries, and cesarean deliveries were comparable (p = 0.845). There were no differences between the two groups in rates of analgesia usage, epidural anesthesia, episiotomy, and second stage duration. However, the severity of dyspareunia correlated with the incidence of perineal tears (66.7% in patients with severe dyspareunia, and 41.1% in controls, p = 0.011). Logistic regression analysis revealed that dyspareunia was independently associated with perineal tears (p = 0.029). Higher rates of anxiety and pelvic floor hypertonicity were reported in patients reporting severe dyspareunia (≥3/10 times).
Conclusion: Dyspareunia is common among primiparous women, and these patients are more likely to suffer perineal tears and anxiety during delivery.

Introduction

It is estimated that 14–34% of young women experience dyspareunia constantly or for an extended period of time [1]. Patients with dyspareunia may experience pain during vaginal penetration (introital dyspareunia), with thrusting, due to friction, or may complain of deep dyspareunia [1]. Causes of dyspareunia vary and include vulvar and vaginal inflammation, skin disorders (e.g. Lichen sclerosus), provoked vestibulodynia, pelvic floor hypertonicity, adjacent organs disorders (bladder, uterus, intestine), endometriosis, and pelvic adhesions [1]. Some women may experience pain with any penetration attempts, while others experience it intermittently.

Not surprisingly, women with chronic dyspareunia report significantly more pain and anxiety during gynecological examinations (GEs) [2]. Thus, women with dyspareunia comprise a medical challenge through all stages of pregnancy and childbirth and require special attention [3].

Despite the high prevalence of dyspareunia, literature investigating the effect of dyspareunia on childbirth is scarce. Most studies examined the effect of childbirth on sexual function, while very few evaluated the effect of dyspareunia on pregnancy and childbirth. Most published data is retrospective and based on medical registries [4–6]. Higher rates of obstetrical interventions and complications in patients with vaginismus and/or localized provoked vestibulodynia were reported [4–6]. Importantly, the high prevalence of dyspareunia appears not to be properly represented in the obstetrical literature. For example, in a study by Goldsmith et al [5], 193,000 deliveries were reviewed, and only 0.06% of patients were reported to have suffered vaginismus. In an

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even larger cohort of 450,000 Swedish women, only 0.6% were reported to have been diagnosed with vaginismus or provoked vestibulodynia [6]. The discrepancy between the actual prevalence of dyspareunia and these low rates may suggest biased results pertaining to obstetrical interventions and complications among this population. Complications during childbirth are theoretically more likely due to maternal anxiety, heightened pain sensation, difficulty in cooperation, intolerance to repeated vaginal examinations, pelvic floor dysfunction and hypertonicity, inability to relax the pelvic floor muscles or to voluntarily push, etc.

Considering the high prevalence of dyspareunia combined with the scarce scientific literature relating to labor and delivery, we opted to prospectively evaluate the prevalence and characteristics of dyspareunia among primiparous patients presenting in active labor and examine whether their obstetrical outcomes differ from patients without such history.

Materials and methods

Primiparous patients who presented in active labor between July 2014 and March 2016, were approached and invited to participate.

The inclusion criteria were: primiparous women, at least 18 years of age, and literate. Exclusion criteria included labor induction or augmentation, non-reassuring fetal heart rate tracing upon admission, and any indication for cesarean delivery (CD). Included patients signed the informed consent form and completed a questionnaire detailing demographic, gynecological and general health history, as well as questions assessing dyspareunia and pain during GEs. Patients who reported pain during sexual intercourse were requested to complete an additional questionnaire regarding dyspareunia characteristics. Midwives and other medical personnel were blinded to the patients' responses, to avoid any influence on management decisions.

Immediately following delivery, the attending midwives were requested to complete a questionnaire regarding patients' behavior during labor and delivery, and delivery outcomes. The description included impression of patients' pain intensity, anxiety level, cooperation, pelvic floor hypertonicity, difficulty in tolerating GEs, ability to understand and carry out instructions regarding pushing efforts, and failure to relax the muscles or paradoxical muscle contraction during straining.

Dyspareunia diagnosis was established according the patient's answer to the question: "Do you experience pain during sexual intercourse?". According to patients' responses to the question, the cohort was subsequently divided into 2 groups: women who reported a history of dyspareunia (exposed group), and women without a history of dyspareunia (control group).

Patients who answered "yes" or "sometimes" were asked to complete an additional questionnaire on dyspareunia severity (i.e. how many times out of 10 episodes of intercourse they experience pain), onset (primary or secondary), patient's experience regarding localization of pain and its cause (introital, deep, muscular or sensation of fear with penetration), length of symptoms, previous medical evaluation, previous diagnoses, and treatment. These questions comprised the outcome measures regarding dyspareunia characteristics.

Data on labor course and outcome included mode of delivery, indications for CD, and perineal integrity post-partum.

The study was approved by the local Institutional Review Board.

Statistical analysis

Data are described as numbers and percentage for nominal variables, mean and standard deviation for continuous parameters. Associations between categorical variables were analyzed with the χ^2 test or Fisher's exact test as appropriate. The comparison of quantitative variables was carried out using the two samples *t*-test or Mann-Whitney non-parametric test (as fitted to Shapiro-Wilk test for normality).

Receiver operating characteristic curve (ROC curve) was used to define the cut-off point for severity of pain during intercourse as an independent variable for delivery outcomes. Multivariate logistic regression model was constructed to account for variables potentially confounding the association between dyspareunia and perineal integrity. All statistical analyses were two tailed and a p-value <0.05 was considered statistically significant. Analysis was done with SPSS-24 software (IBM, Armonk, NY, USA).

Results

One hundred seventy-three primiparous women consented to participate in the study. Of these, 72 (41.6%) parturients reported experiencing pain during intercourse at least sometimes and comprised the exposed group. The participants' clinical and demographic characteristics are shown in Table 1. No significant difference was noted in any of the demographic or clinical characteristics evaluated, including maternal age, gestational age, birthweight, maternal BMI, age at first intercourse, mode of conception, participation in childbirth class, practicing pre-delivery perineal massage, use of the "epi-no" pelvic floor trainer, and level of self-reported anxiety.

Dyspareunia characteristics

Sixty seven of the 72 women who reported pain during intercourse answered additional questions regarding dyspareunia: 40.3% (27/67) reported lifelong dyspareunia (primary dyspareunia), 25.4% (17/67) of the women experienced development of dyspareunia over time (secondary dyspareunia), while 34.3% (23/67) could not recall its beginning

Although the women who reported dyspareunia had intercourse for 5 years on average (range 0–19 years), only 23 out of 67 patients (34.3%) mentioned dyspareunia symptoms to their physicians before or during their pregnancies. Moreover, when we examined this variable in relation to patients with primary dyspareunia, we found that only 37%)10/27(of the women had ever consulted with a practitioner regarding this problem. Medical diagnosis was made in 1967/ cases (28.3%) and included, based on patients' report: vaginitis or fungal infection, vaginismus, pelvic floor hypertonicity, anxiety, provoked vestibulodynia and "other". Treatment was offered to 21/23 (91.3%) of the patients who complained of dyspareunia, and included pelvic floor physiotherapy (14 patients, 66%) and the use of dilators (7 women, 33%). None of the patients were offered sexual therapy, local anesthetic, topical or oral medications, vestibulectomy, emotional focused therapy or couple therapy.

The characteristics of patients' complaints during medical pelvic examinations are presented in Table 2. More women in the dyspareunia group suffered pain during transvaginal ultrasound examinations and GE's, as compared to controls, although 12.2% of the control group also reported pain with GEs.

Delivery outcomes

Delivery outcomes are presented in Table 3. Rates of spontaneous vaginal deliveries, vacuum assisted deliveries and CDs were similar between the groups (p = 0.845) as were the indications for CD. There were no differences between the two groups regarding usage of analgesics, epidural anesthesia, rate of episiotomies, and second stage duration. ROC curve revealed a cut-off point of 3 (out of 10) for dyspareunia severity. This parameter

Table 1
Participants' Clinical & Demographic Characteristics.

	Sample Size n	Total	Range	Dyspareunia Group	Control Group	p-value
Maternal age (years)	173	26.4 (±4.5)	19-42	26.6 (±4.3)	26.2 (±4.6)	**0.519**
Gestational age (weeks)	173	39.7 (±2)	35-43	39.6 (±2)	39.8 (±2)	**0.513**
Parity	168	1.2 (±0.5)	1-4	1.1 (±0.4)	1.2 (±0.5)	**0.395**
Birthweight (gram)	173	3154.7 (±505.9)	2100-4496	3153.7 (±592.6)	3155.4 (±436.9)	**0.7983**
Maternal height (cm)	147	163.65 (±6.3)	148-183	161.8(±13.6)	161.7 (±18.2)	**0.960**
Maternal weight (kg)	149	74.1 (±15.1)	47-168	74.7(±18)	73.6 (±12.8)	**0.672**
BMI (kg/m^2)	145	27.59 (±5.09)	18.3-50.1	26.44 (±4.37)	27.93 (±5.25)	**0.14**
Age of first intercourse (years)	163	20 (±3.3)	15-34	20.8 (±3.6)	19.8 (±3)	**0.065**
Mode of conception	172					
• Spontaneous	156	90.7%		93%	89.1%	**0.392**
• Insemination[1]/ fertility treatment[2]/ IVF[3]	16	9.3%		7%	10.9%	
Participating in childbirth class	170	70%		75.4%	66.3%	**0.207**
Participating in physiological labor training[4]	109	44%		43.1%	44%	**0.922**
Perineal massage[5]	172	41.90%		43.7%	40.6%	**0.688**
Use of epi-no[6]	131	12%		13.6 %	10.8%	**0.628**
Level of anxiety[7]	168					
• Not at all	44	26.20%		25%	26.80%	**0.257**
• Slightly	53	31.50%		25.4 %	36.1%	
• To some extent	53	31.50%		39.4%	25.8 %	
• Very	18	10.7%		9.9%	11.3%	

[1] Fertilization via insertion of sperm directly into the uterus, without additional fertility treatment.
[2] Including drug therapy for ovulation induction.
[3] In vitro fertilization.
[4] Childbirth training which focuses on physiological principals of delivery, emphasizing delivery postures to widen the pelvic opening, motion principles of labor and pushing techniques.
[5] A massage around the opening of the vagina performed by the patient or her partner usually from weeks 34–35, in order to minimize the risk for laceration or episiotomy.
[6] Epi-no is an inflatable balloon device which is inserted into the vagina and inflated. It is a commercial product, used for perineal massage.
[7] The Level of anxiety as was specified by the patient.

Table 2
Pain with medical examinations.

	Sample size *n*	Total %	Dyspareunia Group %	Control Group %	p-value
Pain during transvaginal US examination					**0.015**
• Yes	29	19.1	35.3	14.4	
• Occasionally	36	23.7	26.5	22.9	
• No	87	57.2	38.2	62.7	
• Never had an exam/ no answer	21				
Pain during pelvic examination					<**0.001**
• Yes	31	20.1	48.6	12.2	
• Occasionally	44	28.6	37.1	25.2	
• No	79	51.3	14.3	62.6	
• Never had an exam/ no answer	19				

cutoff was found to increase the presence of perineal tear three-fold, while all other parameters were not found to predict tear rate. Although incidence of perineal tears was comparable between the groups (54% in the dyspareunia group and 41.1% in the control group, p = 0.117), when stratified by dyspareunia severity, 66.7% of the severe dyspareunia patients had vaginal tears, as compared to only 34.5% in mild dyspareunia patients (p = 0.011). Third-degree tears (involving the anal sphincter) were present in 3 patients, all of which belonged to the exposed group (4%, p = 0.016).

A trend was noticed concerning CD indications: second stage arrest of descent was present in 66.7% among the severe dyspareunia group (≥3/10 times) as compared with only 28.6% in mild dyspareunia (<3/10) and 23.1% in controls (p = 0.286). Pain during GEs was also related to perineal tears (p = 0.047) as was duration of second stage of delivery (108.7 ± 60.1 vs 89.6 ± 50 min, p = 0.038).

Several logistic regression analyses were conducted in order to explore the impact of dyspareunia, pain during GEs, second stage duration, and epidural anesthesia on perineal tear rates. Dyspareunia was found to be independently associated with perineal tears (p = 0.029).

Of note, there was a statistically significant difference in CD rate, perineal tear rate, and perceived anxiety level between women who suffer pain on GE and those who do not (29% CDs as compared to 8.9%, respectively, p = 0.039, 54.8% vs 37.8% tear rate, p = 0.047, and anxiety of 1.23 vs. 0.6, p = 0.013).

Midwives' reports

Eighty questionnaires were completed by the attending midwives shortly after delivery (46%). Midwives' reports are presented in Table 4. No differences were found between the two groups

Table 3
Delivery Outcomes.

	Sample Size *n*	All Participants	Dyspareunia Group	Control Group	p value
Mode of delivery	173				
• Vaginal	117	67.60%	65.3%	69.3%	**0.845**
• Vacuum	32	18.50%	19.4%	17.8%	
• CD	24	13.90%	15.3%	12.9%	
Indication for CD	24				
• First stage arrest	4	19.2%	23.1%	15.4%	**0.383**
• Second stage arrest	8	34.6%	46.2%	23.1%	
• Non-reassuring monitor	8	30.8%	15.4%	46.2%	
• 2nd stage arrest and non-reassuring monitor	4	15.4%	15.4%	15.4%	
Perineal tears	173	46.40%	54%	41.1%	**0.117**
3rd degree tear	3	4.20%	13.60%	0	**0.016**
2nd stage duration (minutes)	151	99.99 (±56.55)	102.45 (±58.3)	98.28 (±55.55)	**0.657**
Episiotomy	173	29.2%	31.3%	27.8%	**0.641**
Anesthesia	173				
• Any	172	84.9%	85.9%	84.2%	**0.685**
• Epidural	148	86%	87.3%	85.1%	
• Other	24	14%	12.7%	14.9%	
Delivering staff member	173				
• Midwife	115	66.9%	64.8%	68.3%	**0.628**
• Physician on call	58	33.1%	35.2%	31.7%	

regarding perceived anxiety, tendency to contract pelvic floor muscles, and patient cooperation. However, higher rates of perceived anxiety (1.53 ± 1.06 vs 0.75 ± 1.055, $p = 0.05$) and pelvic floor hypertonicity (1.47 ± 1.3 vs 0.45 ± 0.69, $p = 0.032$) were present in patients reporting severe dyspareunia as compared with mild cases.

Comment

In this prospective cohort of primiparous parturients, as astounding number of patients reported dyspareunia – over 40 percent. These parturients were more likely to suffer perineal tears and anxiety during delivery. Although this rate is in accordance with previous studies evaluating dyspareunia [1], it is not adequately represented in previous studies focused on obstetrical outcomes [4–6].

The prevalence of dyspareunia reported in the literature varies, with rates reported up to 34% [1]. The wide reported ranges probably stem from differences in study designs, definitions of sexual pain, and the populations studied. Since most women with dyspareunia are not diagnosed, we chose to base the definition on maternal self-report.

Previous studies have pointed out several obstetrical characteristics of women with dyspareunia. Goldsmith et al. [5] described exposed women to be younger, deliver lower birthweight and require infertility treatment more often, while Moller et al. [6] reported lower BMI. Our cohort, however, did not find any demographic or clinical differences between the groups.

We found it remarkably concerning that only a small fraction of the exposed parturients ever sought medical help. Women in our cohort reported suffering dyspareunia symptoms for years, but only a third had brought the problem to the attention of their caregivers. An even smaller proportion received a diagnosis or attempted treatments, and many were probably misdiagnosed. In our cohort, 37% (7/19) women who complained of dyspareunia were diagnosed with "vaginitis". Buchan et al. [8] found that most of the cases which were eventually diagnosed as provoked vestibulodynia were for years mistakenly referred to as vaginal yeast infections. Sadly, none of the patients were offered conventional treatment including pharmacological therapy, emotional therapy, sexual therapy, couple therapy, local anesthesia, etc.

We aimed to examine whether patients with dyspareunia are at a higher risk for labor and delivery related complications. We found that, indeed, severe dyspareunia is independently associated with perineal tears. We included only primiparous women in order to obviate any effect of obstetrical history on delivery outcomes. Furthermore, we found that women with higher levels of dyspareunia are at a higher risk for tears during delivery, and specifically 3rd degree tears. Similar findings were presented by Moller et al. [6] who described higher rates of tears in patients with vaginismus or provoked vestibulodynia. We speculate that this finding represents the inability of some patients with dyspareunia to relax their pelvic floor muscles [3]. Midwives' report of pelvic floor hypertonicity in this group supports this notion.

In previous studies higher rates of labor induction [5], assisted deliveries [4–6], epidural anesthesia [5], vaginal tears [6] and CDs [4–7] were described in women with dyspareunia. Previous studies suggested that cesarean deliveries were performed due to difficulty in GEs during labor or upon patients' request, stemming from GE and delivery anxiety. However, according to the midwives' impressions in our cohort, there was no difference between the dyspareunia group and the control group in their capability and cooperation to undergo GE. It is possible that this difference stems from differences in study design and population. Others have used medical registries with a defined diagnosis, possibly tracing the severe margins of dyspareunia cases. We did find, however, higher rates of CDs in women who reported pain during GEs and a trend of a higher CDs performed due to arrest of second stage. It is possible that these outcomes result from pelvic floor hypertonicity as reported by the midwives in patients with higher levels of dyspareunia, which may prevent head descent.

Strengths of the present study include its prospective design, and the unique opportunity to examine dyspareunia presence by maternal self-report. The decision to assess dyspareunia prevalence in this way led to an unexpected high rate of self-reported dyspareunia. However, the current study has several limitations. Lack of an established diagnosis limits validation. In addition, self-reports are always biased, in an already biased cohort of parturients (those willing to participate).

Nevertheless, we strongly believe that the study results are alarming, and further emphasize the need for prospective studies objectively evaluating prevalence and measures in this group of parturients. Lack of awareness in both the caregiver as well as the parturient population is a major issue. Obviously, embarrassment and shame are also involved. Medical staff in the delivery room do not routinely inquire or document dyspareunia. The addition of only few standard questions upon labor admission may allow recognition of these women, and thus attentive and special care. Given the higher tear rates, including severe perineal tear, it is possible that specific attention for women with dyspareunia will enable not only a positive delivery experience, but also prevention of tears, by using relaxation techniques, for example. Better communication between patients and caregivers, using appropriate education and awareness, is undoubtedly warranted.

Table 4
Midwives' Reports on Delivery.

	Sample Size *n*	Total %	Dyspareunia Group %	Control Group %	p-value
Patient experiencing pain	74				
• Not at all	19	25.7	28.6	23.9	**0.811**
• Slightly	23	31. 1	28.6	32.6	
• To some extent	17	21.4	23.9	23	
• Very	10	13.5	10.7	15.2	
• Very much	5	6.8	10.7	4.3	
Patient experiencing anxiety	76				
• Not at all	35	46.1	34.5	53.2	**0.268**
• Slightly	24	31.6	34.5	29.8	
• To some extent	10	13.2	20.7	8.5	
• Very	6	7.9	6.9	8.5	
• Very much	1	1.3	3.4	0	
Pelvic floor contraction	74				
• Not at all	42	56.8	46.4	63	**0.222**
• Slightly	17	23	28.6	19.6	
• To some extent	10	13.5	10.7	15.2	
• Very	4	5.4	10.7	2.2	
• Very much	1	1.4	3.6	0	
Difficulty in examination	74				
• Not at all	61	82.4	82.1	82.6	**0.717**
• Slightly	4	5.4	3.6	6.5	
• To some extent	6	8.1	7.1	8.7	
• Very	1	1.4	3.6	0	
• Very much	2	2.7	3.6	2.2	
Patient's cooperation with midwife's instructions	75				
• Not at all	0	0	0	0	**0.315**
• Slightly	0	0	0	0	
• To some extent	3	4	6.9	2.2	
• Very	21	28	34.5	23.9	
• Very much	51	68	58.6	73.9	
Patient's understanding of midwife's instructions to push	75				
• Not at all	0	0	0	0	**0.0241**
• Slightly	0	0	0	0	
• To some extent	0	0	0	0	
• Very	25	33.3	41.4	28.3	
• Very much	50	66.7	58.6	71.7	
Paradoxical contractions	74				
• Not at all	49	66.2	55.2	73.3	**0.317**
• Slightly	17	23	31	17.8	
• To some extent	6	8.1	10.3	6.7	
• Very	1	1.4	0	2.2	
• Very much	1	1.4	3.4	0	

Compliance with ethical standards

Potential conflicts of interest: The authors report no potential conflicts of interest.

Ethical approval: The Ethics (Helsinki) Committee of Hadassah Medical Organization approved this study. All procedures performed in the study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

All participants signed informed consent.

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