Published in final edited form as:

Am J Obstet Gynecol. 2018 March ; 218(3): 335.e1–335.e6. doi:10.1016/j.ajog.2017.11.604.

Postpartum Depression Screening and Pelvic Floor Symptoms Among Women Referred to a Specialty Postpartum Perineal Clinic

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Abstract

Background—Postpartum depression (PPD) and pelvic floor disorders are both common conditions that affect women; however, the association between the two has yet to be determined.

Objective—The aims of our study are to: 1) determine the prevalence of a positive postpartum depression screen (PPD) in a specialty postpartum perineal clinic, and 2) identify risk factors for postpartum depression in this population.

Study Design—A retrospective chart review was performed of 294 women referred to a specialty postpartum perineal clinic at the University of Michigan between March 30, 2012 and May 3, 2016. Women who completed a new patient intake form, including the Edinburgh Postnatal Depression Scale (EPDS), were included. The prevalence of a positive EPDS screen (> 10) was determined. Bivariate analyses were used to compare demographics, delivery characteristics, referral indications and postpartum pelvic floor symptoms between women with and without a positive EPDS screen. Significant variables identified in the analyses were then used to perform logistic regression to identify factors independently associated with a positive EPDS screen.

Results—15.6% (46/294) of women had a positive PPD screen. Average age was 30.6 ± 4.8 years; average body mass index was 28.9 ± 5.06 kg/m²; 68.0% (200/294) were Caucasian, 79.6% (234/294) were primiparous, and 86.0% (245/285) were breastfeeding. Using multivariable logistic regression, women with a positive PPD screen had higher odds of being non-Caucasian (aOR 2.72, 95% CI 1.27 – 5.832, p=0.01), having a history of depression and/or anxiety (aOR 2.77, 95% CI 1.23 – 6.24, p=0.01), having been referred for pain (aOR 2.61, 95% CI 1.24 – 5.49, p=0.01), and reporting urinary incontinence during and after pregnancy (aOR 3.81, 95% CI 1.57 – 9.25, p=0.003).

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Disclosure: The authors report no conflict of interest.

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Conclusions—Urinary incontinence during and after pregnancy and referral for pain were pelvic floor symptoms independently associated with a positive postpartum depression screen in women referred to a specialty perineal clinic. Therefore, consideration should be given to depression screening in women presenting with perinatal urinary incontinence and persistent postpartum pain, as these women may be at increased risk of developing postpartum depression.

Keywords

Edinburgh postnatal depression scale; fecal incontinence; anal incontinence; dyspareunia; pelvic pain; perineal pain; postpartum depression; postpartum pain; urinary incontinence; obstetric anal sphincter laceration

Introduction

Postpartum depression and pelvic floor disorders are both common conditions that affect women. Pelvic floor disorders are often viewed as conditions affecting the older, postmenopausal population, while postpartum depression occurs in younger, reproductive aged women. Despite the difference in age of onset, common risk factors for both conditions are pregnancy and childbirth.

Postpartum depression affects 10% to 16% of women during the first 12 months after delivery.¹ Postpartum depression shares many common risk factors with major depression unrelated to pregnancy, such as history of depression, emotional stress, and poor socioeconomic status.² Outside of the postpartum state, women with depression are known to have a 30% increased prevalence of urinary incontinence (UI),³ and there are emerging data showing an increased prevalence of fecal incontinence and pelvic organ prolapse with depression as well.⁴⁻⁶ Pelvic pain disorders, including chronic pelvic pain and dyspareunia, also share an association with depression.⁷⁻⁹ Despite this evidence, however, the association between pelvic floor symptoms and postpartum depression has yet to be determined. At our institution, postpartum women who have pelvic floor symptoms related to recent delivery, or whose delivery characteristics place them at high risk for birth injury, are referred to a specialty postpartum perineal clinic where routine postpartum depression screening is performed as part of their new patient intake form. Therefore, the aims of our study are to: 1) determine the prevalence of a positive postpartum depression screen (PPD) in this specialty clinic, and 2) identify risk factors for postpartum depression unique to this population.

Materials and Methods

We performed a retrospective chart review of women who were referred to the Michigan Healthy Healing After Delivery (MHHAD) clinic at the University of Michigan between March 30, 2012 and May 3, 2016. This study received approval from the IRB at the University of Michigan (HUM00102114). Informed consent was waived due to use of de-identified data.

The MHHAD clinic is a specialty clinic staffed by urogynecologists and specially-trained nurses. Ancillary services frequently utilized include lactation support, pelvic floor physical

therapy, social work, and referral to a postpartum/perinatal mood clinic. Women up to one year postpartum can be referred to the MHHAD clinic for any pelvic floor symptom. Common indications for referral include follow-up of complex perineal lacerations and/or obstetric anal sphincter injuries (OASIS) (i.e., third or fourth degree lacerations), delayed healing or other complications related to perineal lacerations, UI, anal incontinence or other defecatory dysfunction, pelvic organ prolapse, urinary retention, pelvic pain, and dyspareunia/sexual dysfunction. At our institution, it is customary for most women with an OASIS to be referred to the MHHAD clinic for follow-up, education, and counseling regarding their perineal laceration.

For this study, women were included if a new patient intake form was available in our electronic medical records system. Demographics, medical history (including a history of depression and/or anxiety), chronic pain conditions (e.g., fibromyalgia, chronic pelvic pain, chronic back pain, migraine or chronic headaches, irritable bowel syndrome, dyspareunia, dysmenorrhea, and endometriosis), delivery characteristics, indication for referral, and questionnaire data were collected via chart review. Patient-reported pelvic floor symptoms were derived from the MHHAD intake questionnaire, which includes “yes/no” questions about urinary and fecal incontinence, both current (i.e., postpartum) and during pregnancy (e.g., “Are you leaking urine?” and “Did you leak urine during your pregnancy?”). Urinary incontinence was quantified using the 8-item, validated Leakage Index developed by Antonakos et al¹⁰ that assess urinary symptoms over the prior month. Scores range from 0 – 8, with higher scores indicating more incontinence, and questions address both stress and urgency symptoms. The Fecal Incontinence Severity Index (FISI)¹¹ was used to quantify anal incontinence symptoms. The McGill Short Form¹² and Present Pain Index¹³ are two validated tools used to describe and quantify pain.

The Edinburgh Postnatal Depression Scale (EPDS) is used to screen for postpartum depression. The EPDS is the most widely used, validated PPD screening tool¹⁴; it consists of 10 items, with responses scored as 0 – 3. Total scores range from 0 to 30, with higher scores reflecting an increased risk of postpartum depression. We defined a positive PPD screen as a score of ≥ 10 on the EPDS.¹⁵

We compared demographics, delivery characteristics, and postpartum pelvic floor symptoms between women with and without a positive PPD screen using bivariate analyses. Significant variables identified in the analyses were then used to perform logistic regression to identify factors independently associated with a positive PPD screen. Statistical analyses were generated using IBM SPSS ® Statistics software, Version 21.0 (copyright 2012 IBM Corporation).

Results

Of the 382 new patients seen in the MHHAD clinic during the study period, questionnaire data for 294 were available for analyses. Average age was 30.6 ± 4.8 years; average body mass index was 28.9 ± 5.06 kg/m²; 68.0% (200/294) were Caucasian, 79.6% (234/294) were primiparous, and 86.0% (245/285) were breastfeeding. All women had a vaginal delivery. Operative vaginal delivery occurred in 14.3% of women (42/294: forceps, N=12 and

vacuum, N=30) and OASIS occurred in 67.0% (197/294). The three most common indications for referral to the clinic were perineal laceration (56.5%, 166/294), pain (16.7%, 49/294), and UI (13.3%, 39/294). The median time from delivery to clinic visit was 24 days (Interquartile Range (IQR) 16, 44). Compared to women included in this study, the 88 women excluded due to missing questionnaire data had lower mean BMI, higher parity, and a lower prevalence of OASIS (data not shown). Remaining demographic and delivery characteristics were similar (data not shown).

Overall, 15.6% (46/294) screened positive for postpartum depression (EPDS score ≥ 10). Table 1 shows the bivariate comparisons of women with and without a positive PPD screen. Groups were similar in terms of basic demographics. Women with a positive PPD screen more frequently had a history of depression and/or anxiety (37.0% vs 17.7%, $p=.003$), but the prevalence of chronic pain disorders, dyspareunia, dysmenorrhea, and/or endometriosis did not differ significantly. Infant weights and prevalence of operative vaginal delivery and OASIS were similar between groups.

Urinary incontinence during pregnancy was reported in 30.8% (88/286), postpartum UI was present in 22.1% (65/284), and 12.6% (37/282) of women had both. The prevalence of UI during pregnancy and postpartum was significantly higher among women with a positive versus negative PPD screen; however, Leakage Index scores were similar (Table 1). Nearly 50% of women with a positive PPD screen reported UI during pregnancy and 35% had postpartum UI. Of the 88 women who reported UI during pregnancy, just over half had resolution of this symptom postpartum (58%, N=51); however, 42.0% (N=37) had persistent UI at the time of clinic evaluation. Almost 30% of women with a positive PPD screen had UI both during and after pregnancy—a prevalence three times greater than that of women with a negative PPD screen.

Prevalence of anal incontinence and FISI scores (reflecting anal incontinence over the previous month) were similar among groups. Of those who responded to questions about anal incontinence, daily flatal incontinence was reported by nearly 40% of women both with and without a positive screen.

Nearly half of women (48.6%, 143/294) were still using ibuprofen and/or acetaminophen for pain control; the prevalence was similar between those with and without a positive PPD screen (52.2%, 24/46 vs 48.0%, 119/248; $p=.60$). Only 8.7% (4/46) of women with a positive PPD screen and 6.0% (15/248) of women with a negative PPD screen were still using opioid-containing medications ($p=.50$). Use of stool softeners (docusate, polyethylene glycol 3350, or other) and sitz baths was similar between groups (data not shown). Perineal pain quantified by the McGill Short Form questionnaire was similar between groups. There was a trend toward more perineal pain reported on the Present Pain Index in the women with a positive PPD screen; however, this difference was not statistically significant.

Overall, the most common referral indication, found in 66.7% (196/294) of women, was for follow-up of a perineal laceration. The next most common referral reason was pain (21.1%, 62/294) followed by UI (13.9%, 41/294), other reasons (2.7%, 8/294), and pelvic organ prolapse (2.4%, 7/294). “Other” referral reasons included urinary retention (N=1), persistent

genital arousal (N=1), extruded Foley bulb during delivery (N=1), pubic symphysis diastasis (N=1), pelvic floor weakness (N=2), and prolonged second stage of labor (N=2). While most women had only one primary referral indication, 9.5% (28/294) had two or three referral indications.

Referral indications were compared between women with and without a positive PPD screen. A greater proportion of women with a positive PPD screen were referred for pain. Median EPDS score among women referred for pain compared to other reasons was 6 IQR (3, 10) versus 4 IQR (2, 7) ($p=.002$). Pain scores on the Present Pain Index and the McGill Short Form were also significantly higher in women referred for pain versus other indications (2 IQR (1, 3) vs 1 IQR (0, 2), $p<.0001$; 8 IQR (4, 13) vs 3 IQR (2, 7), $p<.0001$, respectively). Compared to other reasons, women referred for pain had a lower prevalence of OASIS (72.0% (167/232) vs 48.4% (30/62), $p<.0001$). The number of days between delivery and MHHAD clinic visit was significantly longer among women with a referral for pain versus other reasons (44 IQR (25, 77) vs 21 IQR (15, 32), $p<.0001$). All other variables in Table 1 were not statistically different between women referred for pain versus other referral indications (data not shown).

Using the variables that were significant in bivariate analyses, and controlling for age and race, multivariable logistic regression was then used to determine factors independently associated with a positive PPD screen (Table 2). The variable reflecting UI both during and after pregnancy was selected for use in the final model because of all the UI variables, it had the strongest association with a positive PPD screen in bivariate analyses. In logistic regression, women reporting UI both during and after pregnancy had nearly 4-fold increased odds of a positive PPD screen, which was the strongest association in the model. Non-Caucasian race, referral for pain, and history of depression and/or anxiety were also independently associated with increased odds of a positive PPD screen. When “UI during pregnancy” was used in the model, it was also independently associated with a positive PPD screen (aOR 2.349, 95% CI 1.168 – 4.725, $p=.017$) and the significance of the other variables remained unchanged. Finally, “UI postpartum” was used in the model and was marginally significant (aOR 2.108, 95% CI 0.991 – 4.484, $p=.053$), while significance of the other variables remained unchanged.

Comment

In this study of women at high risk for, or experiencing pelvic floor symptoms following vaginal delivery, 15.6% screened positive for postpartum depression, a rate similar to that reported in the general postpartum population.^{1,16} We identified two unique risk factors for PPD in this population—urinary incontinence and referral for pain.

While the relationship between depression and urinary incontinence has been well-described in the non-pregnant population, very little is known about this association in pregnancy and the postpartum period.¹⁶⁻¹⁸ In one of the few studies regarding UI and postpartum depression, Hullfish et al. reported a significant association between urgency UI scores and a positive PPD screen.¹⁶ Our results extend the literature because we found that UI during

pregnancy has an even stronger association with a positive PPD screen compared to postpartum UI alone. Furthermore, our study was not limited to urgency UI.

The overall prevalence of UI during pregnancy in the current study was 30.8%, which is consistent with prior studies^{19,20}; however, in women with a positive PPD screen, the prevalence was nearly 50%. Even after controlling for a history of depression/anxiety, women with UI during pregnancy had 235% increased odds of a positive PPD screen, and if UI was also present in the postpartum period, the odds increased 380%. This is an important finding, because over half of women with PPD also have depression during or preceding pregnancy.²¹ The American Congress of Obstetricians and Gynecologists (ACOG) recommends depression screening at least once during the perinatal period—pregnancy thru 12 months postpartum²²—but does not specifically recommend routine antenatal depression screening. ACOG Committee Opinion #630 provides several validated screening tools for depression during pregnancy.²² However, given the strong association between UI during pregnancy and PPD, the presence of antenatal UI may help identify women at high risk for depression during pregnancy, which could present an opportunity for early diagnosis, treatment, and prevention of PPD. We propose screening pregnant women during routine obstetrical visits with a simple question such as “Do you have bothersome leakage of urine?” “Yes” responses could be followed up with a short validated questionnaire such as the Urinary Leakage Index,¹⁰ the Sandvik severity index,²³ or the Michigan Incontinence Symptom Index.²⁴

Referral for pain was also identified as independently associated with a positive PPD screen. Pelvic pain is a well-known risk factor for depression outside of the perinatal time,⁷ and we found referral for pain to increase the odds of a positive PPD screen by 2.6-fold. However, the prevalence of chronic pain disorders, dyspareunia, dysmenorrhea, and/or endometriosis did not differ between women with a negative versus positive PPD screen. On average, women referred for pain were seen at six weeks postpartum, or three weeks later than women referred for other reasons. This likely reflects the fact that women referred for pain had persistent pain beyond that expected with normal postpartum recovery. This finding suggests that PPD screening should be considered in women with persistent pain at or beyond the six-week postpartum period.

History of depression and/or anxiety and non-white race were other factors we identified as being associated with a positive PPD depression screen; both findings have precedence in the literature. Prior studies have reported that the risk of postpartum depression more than doubles for women with a history of depression prior to pregnancy²⁵; we found 2.8-fold increased odds. In a study by Howell et al, African-American and Hispanic women had 2-fold increased odds of postpartum depressive symptoms compared to white women²⁶; in the current study, we found 2.7-fold increased odds among women of non-white race.

We recognize that our findings may not be generalizable to a general postpartum population given the nature of the MMHAD clinic's specialty referral base. Furthermore, as our study was cross-sectional in design, we lack long-term follow up of any of these conditions. We were unable to control for a variety of risk factors for PPD such as socioeconomic status, insurance status, history of domestic violence, unintended pregnancy, life stressors, and

others.²⁷ While the questions regarding urinary incontinence during and after pregnancy did not assess onset, severity, duration, or characteristics of symptoms, the simplicity of the questions could potentially make perinatal screening for UI more easily incorporated into a general obstetrics practice. Our study also lacks objective assessment of urinary incontinence such as positive cough stress test, voiding diaries, or pad tests. We may have been underpowered to detect differences in uncommon symptoms like fecal incontinence. Finally, patients are typically seen in our clinic earlier than the routine six-week postpartum visit, which again may affect our results, as some pelvic floor symptoms may improve with time. However, the earlier follow-up may be beneficial for some women with a positive PPD screen, as they receive a referral to psychiatric care sooner than would occur otherwise.

Strengths of our study include the use of validated instruments in assessing postpartum depression and pelvic floor symptoms, use of a standardized questionnaire for all subjects, and a relatively large sample size.

In summary, subjectively reported urinary incontinence during and after pregnancy and referral for pain were significantly associated with a positive postpartum depression screen in women at high risk for pelvic floor symptoms who were referred to a specialty perineal clinic. Risk of a positive PPD screen was highest in women who had UI during and after pregnancy. Therefore, screening for depression should be considered in women with UI during pregnancy and also in postpartum women with persistent UI or pain.

Acknowledgments

Funding: Investigator support for CWS was provided by the National Institute of Child Health and Human Development WHR Career Development Award K12 HD065257. The National Institutes of Health did not play a role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.

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Table 1
Comparison of demographics, delivery characteristics and pelvic floor symptoms in women with and without a positive postpartum depression screen at the time of a postpartum perineal clinic visit

Variables	Positive Postpartum Depression Screen ^a		P value
	Yes N=46	No N=248	
Demographics and Antepartum Characteristics			
Age, years	30.0 (28.0, 33.0)	31.0 (28.0, 34.0)	.67
Body Mass Index, kg/m2	27.0 (26.0, 34.25)	28 (25.0, 32.0)	.60
Race			
Caucasian	27 (58.4)	173 (69.8)	.28
African American	3 (6.5)	17 (6.9)	--
Asian	10 (21.7)	40 (16.1)	--
Other/Unknown	6 (13.0)	18 (7.3)	--
Parity, median (total range)	1 (1, 4)	1 (1, 4)	.09
Smoker	1 (2.2)	8 (3.2)	>.99
Depression/Anxiety	17 (37.0)	44 (17.7)	.003
Chronic Pain Disorders ^b	7 (15.2)	48 (19.3)	.51
Dyspareunia	2 (4.3)	20 (8.1)	.38
Dysmenorrhea/Endometriosis	6 (13.0)	22 (8.9)	.38
Delivery Characteristics			
Gestational Age at Delivery, days	279 (274, 284)	280 (274, 285)	.36
Operative Vaginal Delivery	7 (15.2)	35 (14.1)	.84
Obstetric Anal Sphincter Injury	30 (65.2)	167 (67.3)	.78
Infant Weight, grams	3523.41 ± 485.96	3484.06 ± 509.56	.63
Postpartum Characteristics			
Days from Delivery to Clinic Evaluation	25 (18, 55)	23 (16, 42)	.23
Breastfeeding	37/43 (86.0)	208/242 (86.0)	.99
Edinburgh Postnatal Depression Scale Score	12 (10, 15)	3 (1, 5)	<.0001
Self-Reported Pelvic Floor Symptoms			
McGill Short Form Pain Score (range 0-45)	6 (2, 11), N=39	4 (2, 8), N=188	.12
Present Pain Index (range 0-5)	2 (1, 2), N=41	1 (0, 2), N=192	.06
Urinary Incontinence			
During Pregnancy	21/45 (46.7)	67/241 (27.8)	.01
Postpartum	16/45 (35.6)	49/239 (20.5)	.03
During Pregnancy and Postpartum	13/45 (28.9)	24/237 (10.1)	.001
Urinary Leakage Index (range 0-8)	4 (1, 7), N=33	3 (0, 5), N=163	.13
Fecal Incontinence			
During Pregnancy	0	3/242 (1.2)	>.99
Postpartum	2 (4.4)	15/239 (6.3)	>.99
Fecal Incontinence Severity Index (range 0-61)	7.5 (0, 26), N=22	8 (0, 20), N=135	.67

Variables	Positive Postpartum Depression Screen ^a		P value
	Yes N=46	No N=248	
Daily Flatal Incontinence	10/26 (38.5)	58/147 (39.5)	.92

Data presented as mean $\pm$ SD for normally distributed variables, median (interquartile range) for non-normally distributed variables, and n/N (%) for categorical variables. P values determined using Chi square, student's t-test, Fisher's Exact, and Mann-Whitney U where appropriate.

^aPositive depression screen defined as ≥ 10 on the Edinburgh Postnatal Depression Scale.

^bIncludes fibromyalgia, chronic pelvic or back pain, migraine or chronic headaches, irritable bowel syndrome.

Table 2
Factors associated with a positive postpartum depression screen in women referred to a postpartum perineal clinic

Variable	Crude Odds Ratio	Adjusted Odds Ratio	95% C.I.	Regression coefficient	Standard error	p value
Constant	----	----	----	-1.805	1.112	.105
Age	0.991	0.968	0.903 – 1.038	-0.032	0.036	.362
Non-Caucasian (referent: Caucasian)	1.623	2.717	1.266 – 5.832	.999	0.390	.01
History of Depression/Anxiety	2.718	2.770	1.229 – 6.240	1.019	0.414	.014
Referred for Pain	2.662	2.609	1.240 – 5.487	.959	0.379	.011
Urinary Incontinence During and After Pregnancy	3.605	3.812	1.571 – 9.247	1.338	0.452	.003

Based on a multivariable logistic regression model.