The Journal of Maternal-Fetal & Neonatal Medicine

ISSN: 1476-7058 (Print) 1476-4954 (Online) Journal homepage: http://www.tandfonline.com/loi/ijmf20

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To cite this article: Marti D. Soffer, Zoe M. Adams, Yiting S. Chen & Nathan S. Fox (2018): Risk factors for positive postpartum depression screen in women with private health insurance and access to care, The Journal of Maternal-Fetal & Neonatal Medicine, DOI: 10.1080/14767058.2018.1484096

To link to this article: https://doi.org/10.1080/14767058.2018.1484096

Accepted author version posted online: 31 May 2018.
Published online: 01 Jul 2018.

THE JOURNAL OF MATERNAL-FETAL & NEONATAL MEDICINE
https://doi.org/10.1080/14767058.2018.1484096

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ORIGINAL ARTICLE

Risk factors for positive postpartum depression screen in women with private health insurance and access to care

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ABSTRACT

Objective: To determine risk factors for a positive postpartum depression screen among women with private health insurance and 24/7 access to care.

Study design: Retrospective cohort study of all patients delivered by a single MFM practice from April 2015 to September 2016. All patients had private health insurance and 24/7 access to care. All patients were scheduled to undergo the Edinburgh Postnatal Depression Scale (EPDS) at their 6-week postpartum visit and a positive screen was defined as a score of 10 or higher, or a score greater than zero on question 10 (thoughts of selfharm). Using logistic regression, risk factors for postpartum depression were compared between women with and without a positive screen.

Results: Of the 1237 patients delivered, 1113 (90%) were screened with the EPDS. 81 patients (7.3, 95%CI 5.9–9.0%) of those tested had a positive screen. On regression analysis, risk factors associated with a positive screen were nulliparity (aOR 1.8, 95%CI 1.1, 2.9), cesarean delivery (aOR 1.7, 95%CI 1.1, 2.8), non-White race (aOR 2.0, 95%CI 1.1, 3.5), and a history of depression or anxiety (aOR 4.6, 95%CI 2.6, 8.1). Among the 100 women with a history of depression or anxiety, selective serotonin reuptake inhibitor (SSRI) use in the postpartum period was not associated with a reduced risk of a positive screen (25.5% in those taking an SSRI versus 18.4% of those not taking an SSRI, $p = .39$).

Conclusions: Among women with private health insurance and access to care, the incidence of a positive screen for postpartum depression is approximately 7%. The use of an SSRI did not eliminate this risk. All women should be screened for postpartum depression.

ARTICLE HISTORY
Received 26 March 2018
Revised 22 May 2018
Accepted 30 May 2018

KEYWORDS
Access to care; Edinburgh; health insurance; postpartum depression

Introduction

Postpartum depression is a well described condition affecting approximately one in seven women [1,2]. This condition, if left untreated, has potentially dire consequences for not only the woman affected by depression, but also for her infant and family. There are many well-described risk factors for postpartum depression including preexisting depression, depression during pregnancy, lack of social support, preterm birth, traumatic birth experience, public health insurance, unintended pregnancy, stressful life events, multiple gestation, and domestic violence [3–9].

Despite the robust number of studies looking at postpartum depression, the majority of studies look at a diverse population cared for in disparate health care settings. This approach is valuable when trying to design studies whose results can be generalized to the overall population. However, what remains unknown, are the rates of postpartum depression and the individualized risk factors in more narrow populations, especially those without some of the classic risk factors for postpartum depression. It is well-known that women with public insurance, and those with limited access to care are at higher risk for postpartum depression [4]. However, among women with private insurance and good access to care, the rates of postpartum depression and the risk factors in this population remain unknown.

Our objective was to examine the incidence and risk factors for postpartum depression in a large group of women with private health insurance and good access to health care to determine the rate of postpartum depression and determine which of the existing risk factors remain salient in this population.

Materials and methods

After Biomedical Research Alliance of New York Institutional Review Board approval was obtained, we performed a retrospective cohort study of all women

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delivered by a single maternal–fetal medicine practice between April 2015 and September 2016. In our practice, all patients have private health insurance and have access to care by one of our physicians 24 h a day, 7 days a week. All of the patients' prenatal and postpartum care was conducted by one of the physicians in the practice, and all procedures, ultrasounds, and deliveries were performed by one of the physicians in the practice. All deliveries were at the Mount Sinai Hospital, which is a large tertiary referral center in New York City. Although several immeasurable factors may contribute to socioeconomic status, this population of women at least reflected one of comparable insurance coverage and access to care.

At the 6-week postpartum visit, all patients in the practice are given the Edinburgh Postnatal Depression Scale (EPDS), a validated 10 item questionnaire developed to screen women for postpartum depression [10–12]. We began using this validated screen in clinical practice, which is in accordance with current recommendations [1]. Our primary outcome was a positive screen for depression. We defined a positive screen as a total score of 10 or greater or a score greater than zero on question 10 regarding thoughts of self-harm, which is how a positive screen for the EPDS is typically defined in clinical practice [13,14]. All patients who endorsed self-harm or harm to others were sent to the psychiatric emergency room, and those with a positive screen were referred to a mental health professional for evaluation and possible treatment.

All patients delivered by our practice in the study time period were eligible for inclusion in the study. In addition to EPDS scores, patient characteristics were collected by detailed chart review including maternal age, race, *in vitro* fertilization (IVF), number of gestations, parity, history of depression or anxiety, mode of delivery, spontaneous or induced labor, neonatal intensive care unit (NICU) admission, gestational age at delivery, preeclampsia, gestational diabetes, need for blood transfusion, single relationship status, smoking status, history of drug use, history of domestic violence, and prepregnancy obesity (defined as a body mass index of 30 kg/m^2 or higher).

To compare characteristics between those with and without positive depression screens, we performed a univariate analysis using chi square testing. A planned regression analysis was performed for the comparison of women with and without a positive depression screen, including all baseline characteristics that differed between the two groups at a p value of $<.10$. This analysis was performed in a stepwise backwards fashion, removing any variables with a p value $>.10$. Finally, among the subgroup of women with a history of depression or anxiety, we compared EPDS scores between women who were and were not taking a selective serotonin reuptake inhibitor (SSRI) during the postpartum period. All analyses were performed using SPSS (version 22.0, Armonk, NY).

Assuming a baseline incidence of a positive EPDS screen to be 14% [14], in order to have 80% power to detect a difference in a baseline characteristic from 10% in the negative EPDS group to 20% in the positive EPDS group with an alpha error of 0.05, 816 total patients would be needed.

Results

Over the course of the study period, there were 1328 deliveries. Among them, 1237 women (93%) returned for their postpartum visits. Of these women, 1113 (90%) completed the Edinburgh; 1032 women (92.7%) screened negative and 81 (7.3%) screened positive (95%CI 5.9, 9.0).

Compared to those screening negative, women with a positive EPDS screen were more likely to have multiple gestations, nulliparity, delivered by cesarean section, non-White race, and have a history of depression or anxiety on univariate analysis (Table 1). A regression analysis to control for these differences at baseline, was performed (Table 2) and nulliparity (aOR 1.97, 95%CI 1.09, 2.91), cesarean delivery (aOR 1.71, 95%CI 1.05, 2.79), non-White race (aOR 1.97, 95%CI 1.10, 3.51), and a history of depression or anxiety (aOR 4.62, 95%CI 2.64, 8.08) remained significantly associated with a positive EPDS screen.

The effectiveness of SSRI use in decreasing risk of a positive screen among the 100 women with a history of depression or anxiety was studied and the results are shown in Table 3. Among this subset of women, 51 (51%) use an SSRI and 49 (49%) did not. The likelihood of a positive EPDS screen did not differ between these two groups (25.5 versus 18.4%, $p = .390$), nor did their mean EPDS scores (5.9 ± 5.3 versus 5.8 ± 3.5, $p = .982$).

Discussion

In this study of postpartum depression screening among women with private health insurance and good access to health care, the rate of screening positive for postpartum depression was 7.3%. Risk factors associated with postpartum depression in this population were nulliparity, cesarean delivery, non-White race, and a history of depression or anxiety as seen in the results from the regression analysis. Subanalysis

Table 1. Risk factors for a positive Edinburgh Postnatal Depression Screen.

	Positive screen $N = 81$	Negative screen $N = 1032$	p-value
Age 35 or greater	40 (49.4%)	429 (41.6%)	.170
Multiple pregnancy	11 (13.6%)	77 (7.5%)	.049
Nulliparous	51 (63.0%)	441 (42.7%)	<.001
5th or more child	4 (4.9%)	159 (15.4%)	.010
Preterm birth <37 weeks	17 (21.0%)	143 (13.9%)	.078
Baby gender (singletons)	Male 46 (56.8%) Female 35 (43.2%)	Male 521 (50.5%) Female 511 (49.5%)	.274
Cesarean delivery	42 (51.9%)	335 (32.5%)	<.001
Non-White race	20 (24.7%)	127 (12.3%)	.002
In vitro fertilization	18 (22.2%)	151 (14.6%)	.067
History of depression or anxiety	21 (25.9%)	72 (7.0%)	<.001
Labored	57 (70.4%)	818 (79.5%)	.053
Induction of labor	20 (24.7%)	328 (31.8%)	.181
Neonatal intensive care unit admission	5 (6.2%)	33 (3.2%)	.156
Preeclampsia	5 (6.2%)	44 (4.3%)	.421
Gestational diabetes	3 (3.7%)	58 (5.6%)	.464
Transfusion of blood products	1 (1.2%)	7 (0.7%)	.455
Single (no relationship)	3 (3.7%)	16 (1.6%)	.150
Smoker	0 (0%)	6 (0.6%)	.999
History of drug use	0 (0%)	3 (0.3%)	.999
History of domestic violence	0 (0%)	2 (0.2%)	.999
Prepregnancy obesity (body mass index 30 kg/m^2 or higher)	9 (11.1%)	98 (9.7%)	.686

Data listed as *n* (%).

Table 2. Regression analysis for positive Edinburgh Postnatal Depression Screen.

Risk factor	Adjusted OR (95%CI)
Multiple pregnancy	1.44 (0.70, 2.97)
Nulliparous	1.79 (1.09, 2.91)
Cesarean delivery	1.71 (1.05, 2.79)
Non-White race	1.97 (1.10, 3.51)
History of depression or anxiety	4.62 (2.64, 8.08)

revealed that postpartum SSRI use postpartum among women with a history of depression or anxiety was not associated with a decreased risk for a positive EPDS screen.

The rate of a positive postpartum depression screen in this population of women was found to be significantly less than the rate of a positive depression screen of 14% cited in other studies [14]. This likely reflects a lower incidence of postpartum depression among women with good access to care and fewer issues such as public insurance, substance abuse, and teen pregnancy. However, despite our population having good care and fewer risk factors, there was still a high rate of a positive screen, indicating that all women need to be screened for postpartum depression.

While some well described risk factors remained in this group of women, namely prior depression or anxiety, others were controlled for by studying a population with good access to health care and private health insurance. Among the insured population studied here, in addition to history of depression or anxiety, nulliparas, women delivered by cesarean, and non-White women were at higher risk for the development of postpartum depression. This study demonstrates the risk factors and expected incidence of postpartum depression among a subset of the general population, further informing providers caring for these women.

Additionally, by strictly evaluating patients with access to health care and private health insurance, this study sheds light on the established risks for postpartum depression, namely depression during pregnancy, lack of social support, preterm birth, traumatic birth experience, stressful life events, and domestic violence. Cesarean section may be a traumatic birth experience should it be an emergency or due to fetal distress, or should the need for cesarean be viewed by the patient as a failure or as contrary to her initial wishes; therefore, this risk factor is independent of socioeconomic variables. Lack of social support and domestic violence is more prevalent among publicly insured and racially diverse patients, however, even when patients have private insurance and excellent access to care, non-white women remain at higher risk for postpartum depression. This signifies that other factors besides insurance status and physician access may place non-white women at increased risk compared to their white counterparts. Interestingly, preterm birth and multiple gestation, though described elsewhere as risk factors for postpartum depression [5–7] were not found to be significant in this study. This is especially interesting given that preterm birth may potentially be a traumatic birth experience, though it did not remain a risk factor in our study. It is possible that these women already receive additional support, as women with babies in the NICU frequently have social support services routinely offered.

Table 3. Association of selective serotonin reuptake inhibitor (SSRI) use postpartum with the Edinburgh Postnatal Depression Screen, among women with a history of depression or anxiety.

	SSRI used postpartum, $N = 51$	SSRI not used postpartum, $N = 49$	p
Positive Edinburgh Postnatal Depression Screen	13 (25.5%)	9 (18.4%)	.390
Edinburgh Postnatal Depression Score (mean ± SD)	5.9 ± 5.3	5.8 ± 3.5	.982

SSRI: selective serotonin reuptake inhibitor.

By limiting the scope of the study to women with private insurance and good access to health care, this study demonstrates a need for continued screening of all women for postpartum depression. While social stressors and financial strain may be less in this population as compared to the general population usually described and assessed, this study demonstrates that postpartum depression is prevalent requiring screening and subsequent treatment and attention.

Our study has several strengths. First, a large cohort of women with complete medical records was analyzed, allowing the research to control for baseline differences. While differences between the positive and negative EPDS screen groups existed at baseline, all but one of these differences was found to remain significant when controlling for the baseline characteristics. Second, all women in the cohort were managed by the same group of physicians, controlling for differences in the management of prenatal, labor, and postpartum care. Third and most importantly, the cohort of patients involved all had similar access to care and private insurance allowing us to control for this complex risk factor in our analysis, enabling us to demonstrate the prevalence and risk factors for postpartum women in a subset of the population.

This study is not without weakness. First, our study population was not powered to demonstrate differences between women who did and did not take SSRIs postpartum. It is possible that the findings that were demonstrated in this subanalysis would have been different with a larger study population. Conversely, the lack of effect of SSRIs on the EPDS screen does not indicate a lack of effect on depressive symptoms or suicidal ideation among these women, and additional contributing factors to the study findings would therefore require future study. Also, a positive screen for postpartum depression does not necessarily mean the women had actual postpartum depression. Therefore the 7.3% prevalence of a positive screen does not definitively indicate the same rate of postpartum depression. Additionally, the data on patients' histories of psychiatric illness, SSRI use, domestic violence, and substance use was collected by chart review of patient reported history. While self-reported data are subject to incomplete or inaccurate information, studies like ours rely heavily on patient self-report and chart review data making this study comparable to established literature on the topic. Lastly, patients with postpartum depression or depressive symptoms may not present for postpartum care, thereby biasing the data. Despite this limitation, the postpartum follow up rate was very high in this study.

In conclusion, our study indicates that approximately 7% of women with private insurance and excellent access to care will have a positive postpartum depression screen. Contributing risk factors include nulliparity, cesarean delivery, non-White race, and history of depression or anxiety. The use of SSRIs did not decrease the risk of screening positive for postpartum depression at the postpartum visit. All women should be screened for postpartum depression.

Disclosure statement

No potential conflict of interest was reported by the authors.

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