

Identifying Maternal Depression in the Perinatal Period in Low Socioeconomic Patients

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Abstract

Objective: Perinatal depression affects 1 in 7 women and no ideal screening time has been determined. The objective of this study is to evaluate the optimal time to screen for depression in a high risk, low socioeconomic status population utilizing the Edinburgh Postnatal Depression Scale (EPDS) and the Adverse Childhood Experience (ACE) Questionnaire as well as to identify depression risk factors in this period.

Methods: A retrospective chart review from December 2016 until June 2017 of women presenting for prenatal care who took the EPDS at least once. EPDS was administered at the initial obstetrical visit, third trimester visit, immediately postpartum, and the six-week postpartum visit. The ACE questionnaire was performed at least once during the perinatal period.

Results: 146 patients met inclusion criteria. Median age was 25 years and 82% were African American. 50.6% had fewer than six prenatal care visits and median number of visits 5 (Interquartile range 2 to 10 visits) and only 49.6% (N=63) of patients returned to their six-week postpartum visit. No statistical difference ($p=0.37$) in the incidence of depression was observed at the different time intervals: 34% at initial visit, 25% in third trimester, 20% immediately postpartum, and 31% at the six-week postpartum visit. Of those that screened positive for depression, 18 patients endorsed suicidal or homicidal ideation (37% of those screened positive). Of the comorbidities noted, history of depression was found to be statistically significant toward a positive screen for depression ($p=0.01$). Incidences of depression were similar throughout the perinatal period suggesting that patients can be safely screened for depression at any time throughout the pregnancy or postpartum period.

Conclusion: Patients with positive ACE scores or history of domestic violence should be screened earlier for maternal depression. These findings would allow for early initiation of treatment especially in low socioeconomic settings where loss to follow-up rates are high.

Keywords: Depression; Screening; Pre/Peri/Postnatal Issues; Edinburgh Postnatal Depression Scale; Pregnancy; Adverse Childhood Experiences; Low Socioeconomic Status



Background

Perinatal depression is defined as depression occurring during pregnancy or the subsequent 12 months following pregnancy [1,2]. Perinatal depression affects 1 in 7 women during the perinatal period [3]. Patients with a history of depression are at an increased risk of symptoms during pregnancy. In fact, the most prominent risk factor for perinatal depression is a history of depressive episodes [4]. It is estimated that 54% of women who have experienced depression prior to pregnancy will experience another episode during pregnancy [5]. Untreated depression during pregnancy can result in an increased risk for fetal growth restriction, hypertensive disease, preterm labor, and placental abruption [6]. Untreated depression during the postpartum period also has significant risk, possibly resulting in newborn neglect and morbidity [6]. Putnick et al. [7] detail that up to 25% of mothers may have an increase in depressive symptoms up to 3 years after giving birth [7].

Thus, in order to circumvent these complications and provide symptomatic aid, it is recommended to treat these patients. Pharmacologic treatment itself is an entirely different topic, as many agents have proven safe for patients during the peripartum period or breastfeeding. This requires weighing the risks and benefits and starting medication at the lowest dose and titrate up to control symptoms and maintain safety for both patient and fetus [8]. In order to recognize these symptoms and illness, the American College of Obstetricians and Gynecologists (ACOG) recommend screening at least one time during the perinatal period for depression [6]. However, the ideal time to screen for depression during the perinatal period has not been determined. Many validated screening tools can be utilized to screen for postpartum depression including the Edinburgh Postnatal Depression Scale (EPDS), the Postpartum Depression Screening scale, Patient Health Questionnaire 9, and Beck Depression Inventory. The EPDS is a commonly used screening tool due to its low reading level requirement and ability to be self-administered.

The development of psychiatric disorders during adulthood has been linked to a history of childhood neglect and abuse. Kaiser Permanente and the Centers of Disease Control and Prevention performed a study that found a dose-dependent relationship between the number of adverse childhood experiences (ACEs) and the risk of developing chronic diseases including mental illness(es) later in life. There is also evidence to support that maternal ACEs affect childhood development within the first 12 months, especially relating to communication and motor skills [9]. The ACE Questionnaire is a 10-question scoring method of assessing physical abuse, sexual abuse, emotional abuse, and neglect during childhood. There have been no studies to our knowledge that assess ACEs and their contribution to developing depression in the perinatal period.

The objective of this study is to evaluate the optimal time to screen for depression in a high risk, low socioeconomic status population utilizing the Edinburgh Postnatal Depression Scale and the Adverse Childhood Experience Questionnaire as well as to identify depression risk factors in this period. We hypothesize that screening for depression earlier in the perinatal period will allow for earlier detection of perinatal depression, yielding earlier treatment.

Methods

This was a retrospective study of 146 patients who were seen for pregnancy at our academic institution. This study was approved by the University of Tennessee Health Science Center Institutional Review Board. We abstracted data for all patients treated for pregnancy at our outpatient center from July 2015 to June 2017. The inclusion criteria ruled in patients that completed the Edinburgh Postnatal Depression Scale (EPDS) or Adverse Childhood Experience (ACE) questionnaires during their pregnancy or postpartum period and completed their

delivery at our facility. Patients were excluded from this study if there was insufficient data or if they experienced fetal loss in the first or second trimesters (Figure 1). "Insufficient data" encompasses patients lost to follow up, EPDS without ACE, and too few EPDS.

The EPDS is a common screening tool used to assess postpartum depression. The screening test is composed of 10 questions with a total score that ranges from 0 to 30. A score greater than 10 suggests possible depression and a score greater than 12 suggests depression is likely. Prior to July 2015, the EPDS was routinely provided only at the six-week postpartum visit. Starting July 2015, the screening test was administered at multiple intervals during the perinatal period: first obstetrical visit, third trimester visit, one week postpartum and six-week postpartum visit.

The ACE questionnaire (Figure 1) is composed of 10 questions that assess childhood abuse and neglect. The questionnaire ranges from a score of 0 to 10. The higher the score on the ACE questionnaire, the increased negative health and wellbeing outcomes during adulthood. Adverse Childhood Experience (ACE) questionnaire was performed once during the perinatal period [10].

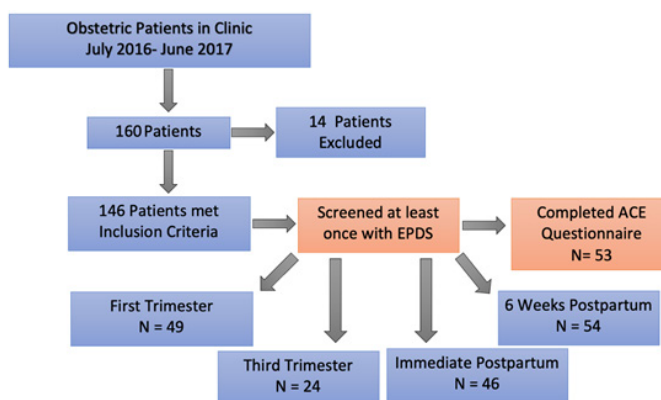


Figure 1: Inclusion and Exclusion Criteria.

Inclusion Criteria: Completion of the EPDS or ACE questionnaires during pregnancy or postpartum period and delivery at our facility. **Exclusion Criteria:** Insufficient data (Lost to follow up, EPDS without ACE, too few EPDS) or fetal loss in first or second trimesters. These criteria excluded 14 patients, leaving 146 patients included. 18% of patients (N=27) were screened at multiple time intervals and the remainder of patients (N=122, 82%) were screened only once. 36% of patients (N=53) completed the ACE questionnaire. 58% of patients (N=86) returned for their six-week postpartum visit. The race of these patients was 82% African American, 12% Caucasian, and 6% Hispanic.

Statistical analysis was performed using SPSS. A p-value of <0.05 was considered the threshold of statistical significance. In addition to descriptive statistics, the McNemar test was utilized to compare the administration of EPDS at different time points. The fisher exact test was used to compare risk factors for depression and the Wilcoxon test was used to assess the association between perinatal depression and ACE scores.

Results

A total of 146 patients met the inclusion criteria. Our patients had a median age of 25 and the range was 13 to 39. The ethnicity composite of the patients included were 82% African American, 12% Caucasian, and 6% Hispanic. The median number of prenatal visits was 6 with an interquartile range of 2 to 10 visits. Fifty-eight percent (N=86) of patients returned to their six-week postpartum visit. Twenty-six percent (N=28) of patients were seen in the Maternal Fetal Medicine clinic for supervision of high-risk pregnancies.

Eighteen percent of patients (N=27) were screened at multiple time intervals during pregnancy, and the remainder of patients were screened only once. Forty-nine patients completed the EPDS at



the initial OB visit, 24 during the third trimester, 46 within 1 week of delivery and 54 at the six-week postpartum visit. No statistical difference ($p=0.37$) in the incidence of depression was observed at the different screening intervals: 34% at initial visit, 25% in third trimester, 20% immediately postpartum and 31% at the six-week postpartum visit (Figure 1). Fifty-three patients completed the ACE questionnaire during the perinatal period. The average ACE score was 1.5 with a range of 0 to 8 points. 19% ($N=28$) of patients had a history of depression or other mental illness. Of those that screened positive for depression across various time points, 18 patients endorsed suicidal or homicidal ideation (37% of those screened positive). Many had risk factors for depression including history of trauma ($N=13$), illicit drug use ($N=18$) or history of domestic violence ($N=8$). Patients also has medical comorbidities including hypertension ($N=11$) and pre-gestational diabetes ($N=11$) (Figure 2).

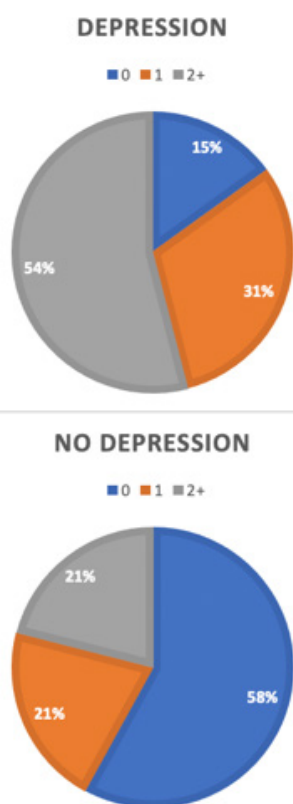


Figure 2: ACE Scores Based on Screening Results. ACE Scores divided between patients screening positive for depression and those who screened negative. The median ACE score was higher in individuals screening positive for depression. ACE of 1.5 vs. ACE of 1 ($p=0.022$).

An ACE score of 1 or greater (p -value 0.02) and a history of depression (p -value 0.01) were each associated with a statically significant increased risk of depression in the perinatal period. Mental illness (excluding depression) ($p=0.12$), illicit drug use ($p=0.21$) and history of domestic violence ($p=0.06$) were associated with an increased risk of depression in the perinatal period but were not statically significant (Table 1).

Discussion

This pilot study is the first to our knowledge to utilize the ACE questionnaire and the EPDS to screen for patients at risk of maternal depression. Our study found that patients who test positive for the ACE score at least once are at an increased risk of maternal depression ($p=0.02$), as are those with a history of depression ($p=0.01$). We found that there is not an optimal time to screen for maternal depression during pregnancy or the postpartum period, as there is no statistical difference in occurrence of depression at each of our time points

($p=0.37$). Therefore, patients with an ACE score of one or greater or a history of depression should be screened earlier for depression using one of the validated screening tools. In patients with regular follow up, it is recommended that screening takes place multiple times in both the early and late postpartum periods and possibly as late as 2-3 years postpartum to accurately track the course of the disease and provide adequate treatments [7,11]. Earlier screening would be more beneficial in high risk, low socioeconomic settings as the rate of postpartum follow up is lower (Table 2).

Table 1: Patient Demographics.

Demographics	146 Patients
Race	
African American	120 (82.00%)
Caucasian	18 (12.00%)
Hispanic	8 (6.00%)
Age	Mean = 25 years (13-39)
Gestational Age	36.7 weeks
Comorbidities	
History of Depression	17 (11.6%)
History of Mood Disorder	14 (9.5%)
Illicit Drug Use	18 (12.3%)
History of Domestic Violence	8 (5.4%)

The demographic factors for our patient population are shown in Table 1. Of the comorbidities listed, only history of depression was found to be statistically significant toward a positive screen for depression ($p=0.01$) as opposed to illicit drug use ($p=0.21$), history of mood disorders ($p=0.12$), or history of domestic violence ($p=0.06$).

Table 2: EPDS Scores at 4 Time Points.

Time Period	EPDS >12	EPDS <12
First Trimester (n=49)	17 (13.8%)	32 (35.12%)
Third Trimester (n=24)	6 (6.8%)	18 (17.2%)
1 week Postpartum (n=46)	9 (13.03%)	37 (32.97%)
6 week Postpartum (n=52)	17 (15.29%)	35 (38.71%)

A Chi-squared analysis was performed, and we found that there was no difference in detecting a positive screening for depression at the different time intervals utilizing the EPDS scale, $p=0.37$.

A limitation of this study was the small number of patients that were screened at multiple time intervals for maternal depression at our academic institution. This was largely secondary to patient noncompliance in attending perinatal visits. This noncompliance rate is possibly due to any number of patient factors that present as barriers to care. In patients with lower socioeconomic status there may be lack of transportation to and from medical visits, lack of insurance to pay for visits, inability to pay for visits even with insurance, or difficulty finding childcare. Patients may also prefer peer support, wish to avoid stigma, or simply wish to avoid pharmacologic treatment [12]. Another limitation was that only 36% of patients completed the ACE questionnaire (Figure 3). The ACE questionnaire asks questions that may be difficult for patients to answer honestly. There were at least two patients in our study who refused to answer the questions. As this was a single institution, these results may not be generalizable to other regions.

There have previously been difficulties discerning which cutoff scores to use on the EPDS to diagnose major depression. Many sources cite a score greater than 11 or “12 or more” as a cutoff, but a single point has been shown to make significant impact in scoring the EPDS [13]. Cox et al. [14] determined that a score greater than 12 was indicative of



depressive illness [14]. There is also the possibility of error in scoring by healthcare workers (Figure 4), as there is the potential for variability between different scorers, and Matthey has previously shown that physicians have less accuracy when scoring an EPDS [13].

In conclusion, the incidence of depression occurs at similar rates throughout the perinatal period suggesting that patients can be safely screened for maternal depression at any time throughout pregnancy or the postpartum period. Patients who score positive for at least one ACE or those with a history of depression should be screened earlier for depression in the perinatal period. Individuals with a history of domestic violence, mental illness, or illicit drug may be considered candidates for early screening using a validated screening tool. These findings allow for early referral or initiation of treatment for maternal depression especially in low socioeconomic settings where loss to follow up rates may be higher.

Finding Your ACE Score

While you were growing up, during your first 18 years of life:

- Did a parent or other adult in the household often or very often... Swear at you, insult you, put you down, or humiliate you? or Act in a way that made you afraid that you might be physically hurt?
Yes No If yes enter 1 _____
- Did a parent or other adult in the household often or very often... Push, grab, slap, or throw something at you? or Ever hit you so hard that you had marks or were injured?
Yes No If yes enter 1 _____
- Did an adult or person at least 5 years older than you ever... Touch or fondle you or have you touch their body in a sexual way? or Attempt or actually have oral, anal, or vaginal intercourse with you?
Yes No If yes enter 1 _____
- Did you often or very often feel that ... No one in your family loved you or thought you were important or special? or Your family didn't look out for each other, feel close to each other, or support each other?
Yes No If yes enter 1 _____
- Did you often or very often feel that ... You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? or Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
Yes No If yes enter 1 _____
- Were your parents ever separated or divorced?
Yes No If yes enter 1 _____
- Was your mother or stepmother: Often or very often pushed, grabbed, slapped, or had something thrown at her? or Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard? or Ever repeatedly hit at least a few minutes or threatened with a gun or knife?
Yes No If yes enter 1 _____
- Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
Yes No If yes enter 1 _____
- Was a household member depressed or mentally ill, or did a household member attempt suicide?
Yes No If yes enter 1 _____
- Did a household member go to prison?
Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score.

Adapted from http://www.kimmelab.org/Files/ACE_Score_Calculator.pdf. 0324080402

Think Trauma: A Training for Staff in Juvenile Justice Residential Settings: Module Four - Finding Your ACE Score

Figure 3: Sample ACE Questionnaire [12].

Although screening greatly increases the chance of correctly identifying those patients with peripartum depression, there remains the issue of patient follow up and how to best direct their care. Even in states where legislative acts have increased screening, there may not have been a change in initiation of treatment [15]. In fact, only about one in five patients sought further care after screening >10 on the EPDS [12]. In addition, there is evidence to support that pregnant women scoring above the threshold who receive mental health services tend to score lower in the postpartum period [16].

To better treat patients who screen positive, at any point of the peripartum window, future research should investigate potential barriers to medical care to hopefully increase patient follow up and ensure these patients are adequately treated. Further research is also needed to assess women in the perinatal period following the COVID-19 as isolation guidelines and social distancing may worsen

any depressive symptoms. Current evidence has found that women have experienced higher levels of stress during childbirth (p= 0.04) and a higher percentage of women have experienced postpartum depression during the pandemic (p=0.38) [17].

Appendix
Edinburgh Postnatal Depression Scale (EPDS)

The Edinburgh Postnatal Depression Scale (EPDS) has been developed to assist primary care health professionals to detect mothers suffering from postnatal depression, a distressing disorder more prolonged than the 'blues' (which occur in the first week after delivery) but less severe than puerperal psychosis.

Previous studies have shown that postnatal depression affects at least 10% of women and that many depressed mothers remain untreated. These mothers may cope with their baby and with household tasks, but their enjoyment of life is seriously affected and it is possible that there are long-term effects on the family. The EPDS was developed at health centres in Livingston and Edinburgh. It consists of ten short statements. The mother underlines which of the four possible responses is closest to how she has been feeling during the past week. Most mothers complete the scale without difficulty in less than 5 minutes.

The validation study showed that mothers who scored above a threshold 10/10 were likely to be suffering from a depressive illness of varying severity. Nevertheless the EPDS score should not override clinical judgement. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt during the previous week, and in doubtful cases it may be usefully repeated after 2 weeks. The scale will not detect mothers with anxiety neuroses, phobias or personality disorders.

Instructions for users

- The mother is asked to underline the response which comes closest to how she has been feeling in the previous 7 days.
- All ten items must be completed.
- Care should be taken to avoid the possibility of the mother discussing her answers with others.
- The mother should complete the scale herself, unless she has limited English or has difficulty with reading.
- The EPDS may be used at 6-8 weeks to screen postnatal women. The child health clinic, postnatal check-up or a home visit may provide suitable opportunities for its completion.

EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)
J. L. Cox, J. M. Holden, R. Sagovsky
Department of Psychiatry, University of Edinburgh

Name: _____
Address: _____
Baby's age: _____

As you have recently had a baby, we would like to know how you are feeling. Please UNDERLINE the answer which comes closest to how you have felt in THE PAST 7 DAYS, not just how you feel today.

Here is an example, already completed.

I have felt happy:
Yes, all the time
Yes, most of the time
No, not very often
No, not at all

This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

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In the past 7 days:

- I have been able to laugh and see the funny side of things
As much as I always could
Not quite so much now
Definitely not so much now
Not at all
- I have looked forward with enjoyment to things
As much as I ever did
Rather less than I used to
Definitely less than I used to
Hardly at all
- I have blamed myself unnecessarily when things went wrong
Yes, most of the time
Yes, some of the time
Not very often
No, never
- I have been anxious or worried for no good reason
Yes, most of the time
Yes, very often
Yes, sometimes
Not very often
No, not much
- I have felt scared or panicky for no very good reason
Yes, quite a lot
Yes, sometimes
No, not much
No, not at all
- Things have been getting on top of me
Yes, most of the time I haven't been able to cope at all
Yes, sometimes I haven't been coping as well as usual
No, most of the time I have coped quite well
No, I have been coping as well as ever
- I have been so unhappy that I have had difficulty sleeping
Yes, most of the time
Yes, sometimes
Not very often
No, not at all
- I have felt sad or miserable
Yes, most of the time
Yes, quite often
No, not at all
No, never
- I have been so unhappy that I have been crying
Yes, most of the time
Yes, quite often
Only occasionally
No, never
- The thought of harming myself has occurred to me
Yes, quite often
Sometimes
Hardly ever
Never

Response categories are scored 0, 1, 2, and 3 according to increasing severity of the symptoms.
Items marked with an asterisk are reverse scored (i.e. 3, 2, 1 and 0). The total score is calculated by adding together the scores for each of the ten items. Users may reproduce the scale without further permission providing they respect copyright (which remains with the British Journal of Psychiatry) by quoting the names of the authors, the title and the source of the paper in all reproduced copies.

Figure 4: Sample EPDS Questionnaire [14].

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