

Original article

Depression and Anxiety of At-Risk Patients in Antepartum Units: A Pilot Observational Study

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Background

Perinatal depression is a common yet underdiagnosed and undertreated disorder that can occur in any trimester of pregnancy and can extend into the postpartum period. The aim of this study was to evaluate depression and anxiety in at-risk antepartum patients hospitalized due to pregnancy complications.

Methods

In this prospective observational study, we measured anxiety and depression using the Patient Health Questionnaire-9 (PHQ-9) and General Anxiety Disorder-7 (GAD-7) and other contributing factors. Statistical analysis was performed using IBM SPSS Version 25.0 with significance set at a p-value <0.05.

Results and Discussion

While 78% had no prior history of treatment for depression (p=0.018), about 33% had a history of depression. Anxiety and depression scores increased from a mean score of 2.8 on PHQ-9 and 3.5 on GAD-7 on admission to 5.0 and 6.8 during antepartum hospitalization, respectively.

Conclusions

This pilot study showed that antepartum admission of at-risk patients was trending toward increased risk of anxiety and depression over time.

BACKGROUND

The prevalence of antepartum depression in the general population is estimated to be around 7-13% of pregnant women.¹ Depression in pregnant women most commonly occurs in the third trimester of pregnancy; however, it can be seen in every trimester and up to 1 year postpartum. Interestingly, of studies performed, depression has been shown to affect up to 27-44% of inpatient antepartum patients, 20-50% of whom had no history of depression prior to their hospitalization, though the number of studies on this topic is quite limited.² This noted increase in the prevalence of depression in hospitalized pregnant patients is not without sequelae. Antepartum depression has been associated with poor fetal outcomes, such as preterm deliveries, low birth weights, and delayed development in neonates.³ There are many proposed factors that can lead to an increased risk of developing depression during pregnancy. One study demonstrated that risk factors, such as history of depression, interpersonal relationship dissatisfaction, being older, low educational level, and intimate partner abuse history, contribute to the development of antepartum depression.⁴ Specifically, the pregnant patient who is hospitalized for any duration of her pregnancy is presented with unique risk factors, such as social isolation, physical activity restriction, financial and family pressures.

Due to this distinctive situation, this vulnerable population is at a high risk for developing depression and other mood disorders.

An estimated average of 4 patients per month are admitted to the antepartum unit at our hospital. The duration of these admissions can vary widely - anywhere from one day up to 60 days or beyond. Throughout this admission, patients have limited resources, social activity, and physical exercise. Due to this drastic change in their life, it is believed and theorized that these patients are at an elevated risk for developing depression and anxiety. To date, we have not evaluated antepartum depression in our at-risk hospitalized patients. Information on this could help prepare and implement resources and programs for these patients during their hospitalization. The objective of this study was to evaluate depression and anxiety in at-risk antepartum patients admitted to labor and delivery due to pregnancy complications.

MATERIALS & METHODS

A prospective observational study was conducted among labor and delivery admissions at Ascension Providence Hospital between October 2020 and September 2022. The Institutional Review Board approval number was #1578657. Inclusion criteria included pregnant patients who were 18

Table 1. Mean scores for Patient Health Questionnaire-9 (PHQ-9) and General Anxiety Disorder-7 (GAD-7).

Factor	Mean	Standard Deviation	Number of Respondents
PHQ-9 score at admission	2.8	2.1	18
PHQ-9 score at 1 week	5.0	5.6	5
GAD-7 score at admission	3.5	3.6	18
GAD-7 score at 1 week	6.8	5.7	5

years and older and were admitted for conditions such as preterm premature rupture of membranes, short cervical length, pre-term contractions/labor, hypertensive disease, multi-fetal gestations, diabetes, placenta previa, abnormal ultrasound findings, and infection. Exclusion criteria included patients with an intrauterine fetal demise, cognitive impairment, or history of suicidal ideation.

Printed questionnaires were administered to patients who consented to participate in the study when they were admitted to the labor and delivery unit. The three surveys provided included one detailing demographic information, General Anxiety Disorder-7 (GAD-7) to screen for anxiety and Patient Health Questionnaire-9 (PHQ-9) to screen for depression.^{5,6} The GAD-7 and PHQ-9 surveys were administered one week after admission. Patients receiving a score of more than 10 on the PHQ-9, indicating moderately severe depression, or a score of 10 on the GAD-7, indicating severe anxiety, were offered to receive a psychiatric evaluation.

The primary outcome of this study was the change in depression and/or anxiety in hospitalized antepartum patients as measured by PHQ-9 and GAD-7 scores. In addition, we also looked at the correlation of length of stay in the hospital with severity of depression and anxiety as measured by PHQ-9 and GAD-7 scores and demographic factors. We hypothesized that depression and anxiety would be significantly increased with antepartum hospitalization.

Descriptive statistics such as frequencies, percentages, and mean ($\pm$ standard deviation) values were generated. Chi-square analysis was performed on variables to compare frequencies within each variable, paired t test was performed on continuous variables and a Pearson correlation was used to analyze factors. Statistical analysis was carried out using IBM Statistical Package for the Social Sciences (SPSS) for Windows version 25.0 (Armonk, NY, USA). Statistical significance was set at a p-value <0.05 .

RESULTS

The results of this study were collected from 18 women throughout their pregnancy over a 24-month period. The mean age in years for the study participants was 31.3 (± 4.2) and ranged from 20 to 38 years old; the mean length of stay was 15.3 days and ranged from 1 to 40 days. The mean gestational age at admission (in weeks) was 29.1 (± 3.0) and ranged from 23.2 to 33.1 weeks. Of the participants, 40% had a high school diploma, 33% had an undergraduate degree, and 27% had a graduate degree.

Of the 18 women, three were admitted for the diagnosis of preeclampsia with severe features, and two were admitted for the diagnosis of preterm premature rupture of membranes. The 13 remaining individuals were admitted for absent dopplers, cervical insufficiency, chronic hypertension, chronic hypertension with superimposed preeclampsia, diabetic ketoacidosis, gestational diabetes, intra-amniotic infection, intrauterine growth restriction, nephrolithiasis, placental abruption, preterm premature rupture of membranes in a repeat low transverse cesarean section and preterm labor.

Measures of anxiety and depression increased on both questionnaires with a mean score of 2.8 on PHQ-9 and 3.5 on GAD-7 on admission and an increase to 5.0 and 6.8 during antepartum hospitalization, respectively, on follow up questionnaires (Table 1). However, we were not able to complete any statistical analysis to compare scores at admission and after one week due to a very small sample size after one week.

There was not a statistically significant correlation between length of stay and age ($p=0.139$), gestational age at admission ($p=0.782$), PHQ-9 score at admission ($p=0.671$) and at one week ($p=0.264$), and GAD-7 score at admission ($p=0.316$) and at one week ($p=0.389$).

As shown in Table 2, several baseline characteristics of patients were found to have statistical significance, including the presence of a support person (83%, $p=0.005$), employment status (56%, $p=0.047$), and no prior history of treatment for depression (78%, $p=0.018$). About a third had a history of depression prior to admission.

DISCUSSION

Our study demonstrates that there was an increase in scores on the PHQ-9 and GAD-7 questionnaires when comparing the means on admission with those obtained at a later point during antepartum hospitalization. Although we were not able to test for statistical significance due to the small sample size after one week due to low participation, the average scores increased from the non- to minimal depression category to mild depression on the PHQ-9 scale. Similarly, scores obtained from the GAD-7 questionnaire increased from minimal anxiety to mild anxiety on average. Overall, inpatient hospitalization of patients for antepartum care on maternal wellbeing showed a trend of increased levels of anxiety and depression pointing to a possible need for antenatal depression screening.

In the United States, about 10% to 20% of women suffer from perinatal depression; however, this is often difficult to

Table 2. Baseline characteristics of patients who responded to the survey.

Characteristic	Response	Frequency	Percent	p value
Support persons	No	3	16.7	0.005
	Yes	15	83.3	
	Total	18	100	
Employment status	Not employed	6	37.5	0.047
	Employed	9	56.3	
	Student	1	6.3	
	Total	16	100	
Relationship status	Married	7	41.2	0.047
	Single	9	52.9	
	Domestic partnership	1	5.9	
	Total	17	100	
History of relationship abuse	No	18	100	
Living situation	With partner	18	100	
History of tobacco abuse	No	13	76.5	0.029
	Yes-Not currently	4	23.5	
	Total	17	100	
History of illicit drug use	No	18	100	
History of depression	No	12	66.7	0.157
	Yes	6	33.3	
	Total	18	100	
History of treatment for depression	No	14	77.8	0.018
	Yes	4	22.2	
	Total	18	100	

recognize.⁷ The American College of Obstetrics and Gynecology recommends screening pregnant women at least one time in the perinatal period using a standardized, validated screening tool.⁸ Common symptoms of depression, such as changes in libido, sleep, or appetite, may go unnoticed as they are passed off as symptoms solely attributed to pregnancy.⁸ A study conducted in Singapore noted the following rates among high-risk pregnant women: 11% major depression, 7% minor depression, 12.5% anxiety disorder, and 5% comorbid depression and anxiety.⁹ A previously performed meta-analysis estimated that positive depression and anxiety screens were observed in approximately 30% of patients on an antepartum unit.¹⁰

When comparing antenatal care in a day-stay setting to inpatient admission, one study concluded that those admitted to inpatient experienced higher levels of anxiety and depression. For both groups, the scores gradually increased from admission to 6-weeks postpartum.¹¹ Anxiety levels were significantly greater in those admitted to the hospital compared to day-stay patients with a higher rate of family relationship disruptions as perceived by the patients. This was further supported by a meta-analysis that reported the prevalence of anxiety and depression to be two times higher among women with pregnancy complications that were hospitalized during the antepartum period.¹⁰ Subsequently, antepartum anxiety and depression

have been shown to predispose infants and mothers to postpartum psychological risks such as bonding with the fetus.¹²

In low-income countries, the prevalence of antenatal depression was noted to be higher and ultimately a predisposing risk factor for low birth weight and preterm birth. While socioeconomic, psychosocial and economic factors contribute to antenatal depression, it is of most importance to prioritize interventions to prevent antenatal depression and ultimately complications of pregnancy.¹³ These preterm deliveries additionally increase the likelihood of having a neonate who requires intensive and complicated care and hospitalization which also increases the risk for postpartum mood disorders.¹⁰

Pregnancy by itself - as stated previously - is a risk factor for depression; however, a hospitalization exacerbates factors such as social isolation, poor sleep, and separation from social supports.¹² Several studies have shown a lower mean depression and anxiety score among those patients able to be managed in the outpatient setting when compared to those in the inpatient setting.¹⁰

One aspect of peripartum depression that warrants further investigation is its management. The identification of an effective treatment method would result in vast public health implications.¹⁴ Furthermore, prior systematic reviews have found increased infantile risks of preterm birth

and small infant size associated with untreated depression in pregnant women when compared to pregnant women without depression.¹⁵ A meta-analysis found that individualized psychotherapy yielded better results than group therapy; however, there were limitations to this study.¹⁴ Determining the optimal approach to therapy would prove to be extremely beneficial in this population where the acceptability rate of pharmacologic antidepressants is often low and there is a strong preference toward non-pharmacologic options. While non-pharmacologic management options may not be as effective as medical management in treating severe forms of depression and preventing its sequelae, it is worth exploring these options, especially as the initial steps of a treatment plan, as they can impact the severity of depression experienced.

The strengths of this study include the sequential surveys throughout a patient's admission. A limitation of this study was the small sample size. Further studies with large sample sizes would be beneficial to determine the validity of these results.

CONCLUSION

The results of this pilot study showed that antepartum admission on labor and delivery was trending toward increased risk of anxiety and depression. These preliminary results emphasize the need for more research on mood dis-

orders in the hospitalized antepartum population and antenatal depression screening. Additional studies to be performed should include an investigation into interventions to improve a patient's mental health during her admission.

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CONFLICT OF INTEREST DISCLOSURE

The named authors have no conflicts of interest, financial or otherwise.

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