Impact of antenatal depressive and anxiety symptoms on adverse birth outcomes in Baghdad, Iraq: a prospective cohort study

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Abstract:

Background: Psychiatric symptoms are common during pregnancy, potentially leading to an increased risk of adverse birth outcomes. Studies assessing the impact of depression and/or anxiety on adverse birth outcomes in Iraq are currently lacking. This study aims to determine whether depression and/or anxiety is independently associated with preterm birth (PTB) and low birth weight (LBW).

Methods: A prospective cohort study included 352 pregnant women from outpatient clinics of Al-Yarmouk hospital and private clinics in Baghdad, Iraq from March 2021 to February 2022 using a convenience sampling. They were screened for depression using Edinburgh Postnatal Depression Scale (EPDS) during pregnancy and followed up to assess adverse birth outcomes. Multivariable logistic regression was used to determine predictors associated with adverse birth outcomes.

Results: The prevalence of PTB and LBW was 7.7% and 11.6%, respectively. After adjustment of all potential sociodemographic, clinical and obstetric confounders, depression was independently associated with giving birth to LBW neonate (odd ratio (OR):3.64; 95% confidence interval (CI) 1.70, 7.79), but not PTB. Prevalence of LBW in depressed was 21.2% compared to 7.7% for non-depressed. LBW was also associated with a history of LBW and PTB. In contrast, anxiety did not seem to affect birth outcomes.

Conclusion: Depression during pregnancy, regardless of the trimester, is independently associated with a higher likelihood of giving birth to LBW neonates (OR: 3.64; 95% CI 1.70, 7.79). Effective interventions that target maternal depression are vital to decrease morbidity and mortality associated with LBW.

Key words: antepartum depression, anxiety, adverse birth outcome, low birth weight, preterm birth, Iraq

تأثير أعراض الاكتئاب والقلق قبل الولادة على نتائج الولادة السلبية في بغداد ، العراق: دراسة مستقبلية

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الخلاصة:

الخلفية: الأعراض النفسية شائعة أثناء الحمل ، مما قد يؤدي إلى زيادة خطر حدوث نتائج سلبية للولادة. الدراسات التي تقيم تأثير الاكتئاب و / أو القلق على نتائج الولادة السلبية في العراق غير متوفرة حاليًا. تهدف هذه الدراسة إلى تحديد ما إذا كان الاكتئاب و / أو القلق مرتبطين بشكل مستقل بالولادة المبكرة وانخفاض الوزن عند الولادة.

الطريقة: اشتملت الدراسة على 352 امرأة حامل من العيادات الخارجية في مستشفى اليرموك والعيادات الخاصة في بغداد ، العراق من آذار 2021 إلى شباط 2022 باستخدام عينة ملائمة. تم فحصهم للاكتئاب باستخدام مقياس ادنبره للاكتئاب بعد أثناء الحمل ومتابعتهم لتقييم نتائج الولادة السلبية. تم استخدام الانحدار اللوجستي متعدد المتغيرات لتحديد المؤشرات المرتبطة بنتائج الولادة السلبية المتمثلة بالولادة المبكرة وانخفاض الوزن عند الولادة.

النتائج: كان انتشار الولادة المبكرة وانخفاض وزن الولادة 7.7٪ و 11.6٪ على التوالي. بعد تعديل جميع المربكات الاجتماعية والديموغرافية والسريرية والتوليدية المحتملة ، ارتبط الاكتئاب بشكل مستقل بولادة حديثي الولادة منخفضي وزن الولادة ، ولكن ليس الولادة المبكرة. بلغ معدل انتشار انخفاض الوزن عند الولادة 21.2٪ مقارنة بـ 7.7٪ لغير المصابين بالاكتئاب. كما ارتبط انخفاض الوزن عند الولادة بتاريخ من انخفاض الوزن عند الولادة والولادة المبكرة. في المقابل ، لا يبدو أن القلق يؤثر على نتائج الولادة.

الخلاصة: الاكتئاب أثناء الحمل ، بغض النظر عن وقت الاكتئاب اثناء الحمل ، يرتبط بشكل مستقل بارتفاع احتمال ولادة حديثي الولادة منخفضي الوزن عند الولادة. التدخلات الفعالة التي تستهدف اكتئاب الأمهات أمر حيوي لتقليل المراضة والوفيات المرتبطة بانخفاض الوزن عند الولادة

الكلمات المفتاحية: اكتئاب ما قبل الولادة ، قلق ، نتائج سلبية للولادة ، انخفاض الوزن عند الولادة ، الولادة المبكرة ، العراق

Introduction

Psychiatric symptoms during pregnancy are public health concerns, with depression and/or anxiety affecting 10-20% of pregnant women, potentially leading to increased disability-adjusted life years. [1]-[3] Depressive and/or anxiety symptoms not only increase the maternal risk of pregnancy-related complications but also increase the risk of adverse birth outcomes.[4],[5] Depression appears to increase the risk of preterm birth (PTB) and low birth weight (LBW).[4],[6],[7]

Over the past 20 years, there has been a substantial reduction in the child mortality rate in Iraq.[8] Improvement in child mortality stems from mainly a reduction in under-five child mortality due to advancements in the treatment of infectious diseases worldwide.[9] This makes neonatal and infant mortality the leading causes of child mortality.[9] PTB and LBW are significant contributors to the global burden of neonatal and infant deaths.[10] For instance, LBW neonates have a 40 times higher likelihood of mortality within the first 30 days of life compared to normal birth-weight neonates.[9]

Birth weight is an important prognostic factor for child health and well-being and a reflection of the nutritional, mental, and physical health status of the mother and the development of the fetus.[11] LBW, defined as a birth weight of less than 2500 gm measured immediately after delivery, irrespective of gestational age, is the leading cause of neonatal mortality worldwide.[11] Surviving LBW children may suffer a range of complications such as decreased linear growth, obesity, malnutrition, asthma, susceptibility to infection, lower immunity, as well as future development of cardiovascular diseases and diabetes in adulthood.[2],[7],[9],[10] Globally, 15% of all newborns are LBW representing 20 million, with nearly 96% of them in low and middle-income countries (LMIC).[9] According to a national health survey in Iraq, the LBW rate has risen from 13.4% in 2011 to 25.2% in 2018.[12] The rising trend is a barrier to achieving the WHO goal of reducing LBW by 30% by 2025.[13]

The term PTB is defined as a delivery before 37 weeks of gestation.[7] The lower the weight and the shorter the gestational age, the lower the chance of

survival.[11] According to WHO, 15 million PTB are born annually, and the majority occur in LMIC.[13] Like LBW, it is a predictor of child morbidity and mortality, as it is responsible for 1 million child deaths annually.[9],[13] Long-term consequences include hearing and vision problems, cerebral palsy, and insufficient growth.[4] Thus, preventing PTB and LBW is crucial for reducing morbidity and mortality in childhood and adulthood. Established risk factors for LBW and PTB include maternal anthropometric measures, parity, age, socioeconomic status, intimate partner violence, smoking, alcohol, preeclampsia, and gestational hypertension or diabetes.[5],[7],[13],[14] In addition, depression is now increasingly recognized as an independent risk factor for LBW (RR = 1.86, CI 1.32-2.62), as demonstrated in a 2021 meta-analysis.[15] Although depression is the most widely used proxy measure of psychological stress, anxiety, which often co-occur with depression, has also been associated with adverse birth outcome.[1] Despite being a region with a high prevalence of LBW and depression, mental health associations with adverse birth outcomes remain largely under-researched in Iraq.[12],[16] Given the lack of evidence of the relationship between adverse birth outcomes and psychiatric symptoms in Iraq, we aim to address this gap in the literature by examining the role of depression and anxiety on the risk of adverse birth outcomes in a sample of pregnant women in Baghdad, Iraq.

Methods

Ethical approval

This study was approved by the University of Mustansiriyah and the Ministry of health. Study intentions and procedures were explained to participants, and they were asked to provide a written informed consent to participate in the study. Each participant was assigned a code number to protect patient confidentiality, and analysis was performed on anonymous data.

Study design and setting

A prospective cohort study design was employed to recruit pregnant women from antenatal care clinics of Al-Yarmouk teaching hospital and private obstetric clinics from urban areas in Baghdad, Iraq from March 2021 to February 2022 using a convenience sampling method.

Data collection

The data was collected by an experienced clinical pharmacist. All pregnant women in the first, second, or third trimester were included. Multiple gestation pregnancy, at-home delivery, and those who do not have a contact phone number were excluded.
Baseline, demographic, social, clinical information and psychometric questionnaire were obtained through structured face-face interview. The last menstrual period or obstetric estimate was used to calculate gestational age.

Exposure measures

Depression

Edinburgh Postnatal Depression Scale (EPDS) was used to measure depressive symptoms. It consists of 10 questions; each has four options graded from 0-3, the resulting score range between 0 and 30; a score of ≥13 was used as a cut-off for depression.[17] We used the validated Arabic version, which has a Cronbach's alpha value of 0.84.[18]

Anxiety

Anxiety symptoms were assessed using a generalized anxiety disorder-7 (GAD-7) questionnaire, which consists of 7 items. Each has four options resulting in a total score of 0-21; a score ≥10 is used as a cut-off for anxiety.[19] The validated Arabic version was used with a Cronbach's alpha of 0.76.[20]

Confounders

Intimate partner violence

Intimate partner violence was measured using the hurt, insult, threaten, and scream (HITS) screening tool. HITS scale consists of 4 questions; each has four options

ranked from 0-5, resulting in a final score of 0-30, a value greater than ten considered positive. [21] The tool is valid and reliable used in many Arabic countries, including Saudi Arabia and Egypt. [21]

Maternal support

Maternal support was assessed using the maternity social support scale (MSSS), which consists of 6 questions; each has four options ranked from 1-5, resulting in a total score of 6-30; high social support was defined as a value ≥ 24, low social support as less than 24. The Arabic version was used, which demonstrates a reliable validity with a Cronbach's alpha of 0.90.[22]

Maternal nutritional status

Maternal nutritional status was assessed using maternal body mass index (BMI) measured upon enrollment. BMI is estimated by dividing weight in kg over square height in meters.

Additional factors

Other potential confounders include maternal age, education, occupation, family income, and exercise defined as engaging in a physical activity such as housework. Assessment of pregnancy complications, including anemia, gestational or chronic hypertension, and gestational or chronic diabetes, was obtained through self-report during the interview.

Birth outcomes

Information related to outcomes of interest include PTB and LBW were obtained from medical records or phone interviewing. PTB was defined as childbirth before 37 weeks of gestation. LBW was defined as a birth weight less than 2500 gm immediately after delivery, regardless of gestational age. Each mother delivered at the hospital is given a birth notification card containing birth weight measured immediately after delivery, gestational age at delivery, sex of baby, and mode of delivery.

Statistical analysis

The normality of continuous variables was assessed using Shapiro-Wilk normality tests and histograms. Consequently, a t-test or t-test with welch correction was used to estimate mean (S.D) to compare differences between groups. Pearson chi-square test or fisher exact tests were used to compare categorical variables. Variables with p-value <0.2 in bivariate analysis were examined using multivariable binary logistic regression. Variables with p-value ≥ 0.2 were excluded from the multivariable analysis. Gestational age and birth weight at delivery were considered as dependent variable and analyzed separately. Maternal and newborn characteristics were regarded as independent variables. Statistical analysis was performed using SPSS V.21.0, Chicago, Illinois, USA. Differences were deemed to be significant if $p<0.05$.

Results

Sociodemographic, obstetric and psychological characteristics of the study population

A total of 352 women were included. The mean age (S.D) of participants was 26.4 (5.78) years, range: 16-43 years, and only 10.8% were ≥35 years. With regard to settings, 53.1% were recruited from private clinics and the remaining (46.9%) from Al-Yarmouk public hospital. The majority (71.3%) were enrolled during the third trimester, 17.1% during the second, and only 11.6% during the first trimester. Just over half of the participants (53.7%) have a primary or middle school education, and the majority (82.4%) were homemakers. Most participants (90.1%) were physically active during pregnancy. All women were married, non-smokers, and not recipients of antidepressant therapy.

With regard to clinical and obstetric characteristics, only 34.9% were primiparous, the remaining (65.1%) were multiparous; 29.3% had a history of miscarriage; 5.1% had a history of PTB, and 9.7% had a history of LBW.

Approximately 33.0% had anemia, and the prevalence of chronic or gestational hypertension and chronic or gestational diabetes was 5.1% and 3.4 %, respectively. Just over half of newborns (52.3%) were female, and 63.6% were delivered by cesarean section.

With regard to psychological characteristics, 29.5% of participants had EPDS ≥13, and 33.8% had GADS of ≥10. With regard to social support, 54.5% have an MSSS of ≥24. Only 9.9% had a HITS score of >10, Table 1.

Table (1): Characteristics of the study population (n=352)

Characteristics	N (%) or mean (S.D), range
Age (years)	26.4 (5.78), (16-43) years
Education	
Less than secondary	189 (53.7)
≥ secondary	163 (46.3)
Maternal employment	
Homemaker	290 (82.4)
Employed	62 (17.6)
Family income (Iraqi Dinar)	819357.0 (752194.7), (0-6000000)
Body mass index	30.0 (5.3), (18.4-47.9)
Sex of neonate	
Female	184 (52.3)
Male	168 (47.7)
Gestational age at delivery	38.2 (1.5), (29.0-41.0)
Birth weight	3058.8 (623.4), (1003.0-5500.0)
Depression	
Yes	104 (29.5)
No	248 (70.5)
Anxiety	
Yes	119 (33.8)
No	233 (66.2)
Social support	
Low support	160 (45.5)
High support	192 (54.5)
Intimate partner violence	
Yes	35 (9.9)
No	317 (90.1)

Prevalence and predictors of preterm birth

In this study, the prevalence of PTB was 7.7%. There was no statistically significant difference between low and normal birth weight neonates with regard to age, education, occupation, or BMI. In addition, there was no statistically significant difference with regard to several clinical and obstetrical maternal characteristics, including parity, history of miscarriage and PTB, anemia, and chronic or gestational hypertension, Table 2. In bivariate analysis, exercise, sex of neonate, previous history of LBW, and LBW were associated with PTB. Gestational DM and previous history of miscarriage were marginally significant, p=0.056 and 0.071, respectively, Table 3.

No statistically significant relationship was observed between anxiety or depression

and PTB, Table 4. In multivariable logistic regression analysis, male sex (odd ratio (OR): 3.768; 95% confidence interval (CI) 1.426, 9.956), DM (OR: 6.391; 95% CI: 1.403, 29.122) and LBW (OR: 7.865; 95% CI 2.994, 20.660) were independent predictors of PTB, Table 5.

Table (2:) Bivariate analysis of confounders not associated with the outcome of interest

Characteristics	Low birth weight			Preterm birth		
	Yes (n=41) n (%)	No (n=311) n (%)	P-value	Yes (n=27) n (%)	No (n=325) n (%)	P-value
Age (years)	25.9 (6.2)	26.5 (5.7)	0.535	27.1 (5.5)	26.4 (5.8)	0.537
Education			0.546			0.546
Less than secondary	25 (7.1)	164 (46.6)		16 (4.5)	173 (49.1)	
≥ secondary	16 (4.5)	147 (41.8)		11 (3.2)	152 (43.2)	
Maternal employment			0.160			0.441
Homemaker	37 (10.5)	253 (71.9)		24 (6.8)	266 (75.5)	
Employed	4 (1.1)	58 (16.5)		3 (0.9)	59 (16.8)	
Family income (ID) mean, S.D	665274.4 (713520.1)	839670.1 (755898.4)	0.150	759287.0 (756485.9)	824347.4 (752793.4)	0.671
Body mass index mean, (S.D)	29.4 (5.60)	30.10 (5.26)	0.443	29.9 (5.51)	30.02 (5.29)	0.980
Parity			0.615			0.238
0	12 (3.4)	111 (31.5)		7 (2.0)	116 (32.9)	
1	15 (4.3)	86 (24.4)		6 (1.7)	95 (27.0)	
2	6 (1.7)	58 (16.5)		9 (2.6)	55 (15.6)	
≥3	8 (2.3)	56 (15.9)		5 (1.4)	59 (16.8)	
Previous history of miscarriage			0.273			0.071
Yes	15 (4.2)	88 (25.0)		12 (3.4)	91 (25.9)	
No	26 (7.4)	223 (63.4)		15 (4.3)	234 (66.4)	
Previous history of preterm birth			1			0.141
Yes	2 (0.5)	16 (4.5)		3 (0.9)	15 (4.2)	
No	39 (11.1)	295 (83.9)		24 (6.8)	310 (88.1)	
Anemia during pregnancy			0.218			0.965
Yes	17 (4.8)	99 (28.2)		9 (2.6)	107 (30.4)	
No	24 (6.8)	212 (60.2)		18 (5.1)	218 (61.9)	
Chronic or gestational Hypertension			0.246			1
Yes	0 (0)	18 (5.1)		1 (0.3)	17 (4.8)	
No	41 (11.6)	293 (83.3)		26 (7.4)	308 (87.5)	

Table (3): Bivariate analysis of confounders associated with the outcome of interest

Characteristics	Low birth weight			Preterm birth		
	Yes (n=41) n (%)	No (n=311) n (%)	p-value	Yes (n=27) n (%)	No (n=325) n (%)	P-value
Exercise during pregnancy			0.158			0.039
No	7 (1.9)	28 (8.0)		6 (1.8)	29 (8.2)	
Yes	34 (9.7)	283 (80.4)		21 (5.9)	296 (84.1)	
History of low birth weight			0.000			0.009
Yes	12 (3.4)	22 (6.3)		7 (2.0)	27 (7.7)	
No	29 (8.2)	289 (82.1)		20 (5.7)	298 (84.6)	
Chronic or gestational diabetes			0.638			0.056
Yes	2 (0.5)	10 (2.8)		3 (0.9)	9 (2.5)	
No	39 (11.1)	301 (85.6)		24 (6.8)	316 (89.8)	
Sex of neonate			0.393			0.014
Female	24 (6.8)	160 (45.5)		8 (2.3)	176 (50.0)	
Male	17 (4.8)	151 (42.9)		19 (5.4)	149 (42.3)	
Mode of delivery			0.041			0.112
Normal vaginal	9 (2.6)	119 (33.8)		6 (1.7)	122 (34.7)	
Cesarean delivery	32 (9.1)	192 (54.5)		21 (5.9)	203 (57.7)	
Preterm birth						
Yes	12 (3.4)	15 (4.3)	0.000			
No	29 (8.2)	296 (84.1)				
Low birth weight						
Yes				12 (3.4)	29 (8.2)	0.000
No				15 (4.3)	296 (84.1)	
Settings			0.111			0.347
Public hospital	24 (6.8)	141 (40.1)		15 (4.3)	150 (42.6)	
Private clinics	17 (4.8)	170 (48.3)		12 (3.4)	175 (49.7)	

Table (4): Psychological and behavioral characteristics of participants stratified by the outcome of interest

Characteristics	Low birth weight			Preterm birth		
	Yes (n=41) n (%)	No (n=311) n (%)	P-value	Yes (n=27) n (%)	No (n=325) n (%)	P-value
Depression			0.000			0.375
Yes	22 (6.2)	82 (23.3)		10 (2.8)	94 (26.7)	
No	19 (5.4)	229 (65.1)		17 (4.8)	231 (65.6)	
Anxiety			0.270			0.101
Yes	17 (4.8)	102 (28.9)		13 (3.7)	106 (30.1)	
No	24 (6.8)	209 (59.4)		14 (4.0)	219 (62.2)	
Social support			0.649			0.609
Low support	20 (5.7)	140 (39.8)		11 (3.1)	149 (42.3)	
High support	21 (5.9)	171 (48.6)		16 (4.5)	176 (50.0)	
Intimate partner violence			0.272			0.169
Yes	6 (1.7)	29 (8.2)		5 (1.4)	30 (8.5)	
No	35 (9.9)	282 (80.2)		22 (6.3)	295 (83.8)	

Table (5): Multivariable binary logistic regression of predictors independently associated with adverse birth outcome

Characteristics	Low birth weight		Preterm birth	
	Odd ratio (95% CI)	P-value	Odd ratio (95% CI)	P-value
Sex of neonate				0.007
Female			Reference	
Male			3.768 (1.426, 9.956)	
Settings		0.035		
Private sector	Reference			
Public sector	2.344 (1.061, 5.179)			
Diabetes mellitus				0.017
No			Reference	
Yes			6.391 (1.403, 29.122)	
Depression		0.001		
No	Reference			
Yes	3.643 (1.703, 7.794)			
History of low birth weight		0.004		
No	Reference			
Yes	3.835 (1.526, 9.636)			
Low birth weight				0.000
No			Reference	
Yes			7.865 (2.994, 20.660)	
Preterm birth		0.000		
No	Reference			
Yes	6.244 (2.406, 16.205)			
CI: Confidence interval.				

Prevalence and predictors of low birth weight

The prevalence of LBW was 11.6%. There was no statistically significant difference between low and normal birth weight neonates with regard to age, education, occupation, or BMI. In addition, there was no statistically significant difference with regard to several clinical and obstetrical maternal characteristics, including parity, history of miscarriage and PTB, anemia, and chronic or gestational hypertension, Table 2. In bivariate analysis, mode of delivery, history of LBW and PTB were associated with LBW, Tables 3. There was a statistically significant association between LBW and depression- prevalence of LBW in depressed was 21.2% compared to 7.7% for non-depressed; in contrast, no association was observed between LBW and anxiety, Table 4. In multivariable binary logistic regression, women recruited from public health sector (OR: 2.344; 95%CI 1.061, 5.179), depression (OR: 3.643, 95% CI; 1.703, 7.794), history of LBW (OR: 3.835; 95% CI 1.526, 9.636) and PTB (OR: 6.244; 95% CI 2.406, 16.205) were independent predictors of LBW, Table 5.

Discussion

The present study examined the association between depression, anxiety and adverse birth outcomes in pregnant women in Baghdad, Iraq. When considering all other factors constant, depressed women are more likely to deliver LBW infants (OR: 3.643; 95% CI: 1.703, 7.794) than non-depressed. However, there is no evidence that depression increases the risk of PTB. Besides, there was no association between anxiety and adverse birth outcome.

The LBW rate is comparable to the 13.4% reported in the 2011 national survey and less than 25.2% reported in 2018.[12] This may be due to our exclusion of multiple gestation pregnancies. In addition, the LBW rate reported in the national survey reflects public hospitals; our patients are delivered in private and public hospitals.

Our results are in line with other studies in Australia, China, Malaysia, India, and Egypt, where depression independently increases the odds of LBW. [2],[4] [23]-[25] Evidence on the association between depression and adverse birth outcomes is conflicting.[15] A 2021 meta-analysis of 29 studies from the US, Europe, and developing countries indicate a statistically significant association between LBW, PTB, and depression with a higher effect size for studies from LMIC; on the other hand, a subsequent meta-analysis of 30 studies reveals no evidence of such association.[15],[26] Differences in findings among studies can be attributed to differences in study design, settings, tools to measure depression, and different cut-offs used to define depression. A recent systematic review and meta-analysis, including studies from LMIC, associates maternal depression with low birth weight.[27]

Depression may contribute to adverse birth outcomes through several pathways. The first is the activation of the hypothalamic-pituitary-adrenal axis and subsequent release of the stress hormone cortisol, which may diminish oxygen and nutrient delivery to the fetus contributing to either fetal death/miscarriage or LBW.[7], [28] Furthermore, depressed women tend to have poor nutrition and compliance with antenatal vitamin administration and obstetric care visits.[7] Moreover, pregnancy-related complications and infections may be overlooked by depressed women due to low health-seeking behavior.[7]

In the bivariate analysis, a history of LBW was significantly associated with PTB and LBW. In multivariable logistic regression analysis, a history of LBW significantly increases the odds of LBW (OR: 3.835; 95% CI 1.526, 9.636). This finding is in line with other studies conducted in developed and developing countries, which highlights the need for adequate antenatal

care and monitoring for those high-risk groups of patients to improve birth outcomes.[10]

A preterm neonate is six times more likely to be LBW than a term neonate. Fetal growth is progressively accelerated in the last two months of pregnancy.[29] For instance, the mean weight of a fetus at 27 weeks of gestation is 1004 g versus 2781 g at week 37.[29] Thus, the preterm newborn has less time to grow in utero and is more likely to be LBW.[29]

In our study, fetal sex was an independent risk factor for spontaneous preterm birth. Studies consistently demonstrate that women carrying a male fetus are at an increased risk of spontaneous PTB in western and non-western countries.[30],[31] Possible explanations could be hormonal differences between sexes, differences in placental response to adverse events, higher birth weight of male fetuses compared to females, and susceptibility of women carrying a male fetus to pregnancy-related complications.[30],[31]

Increased rate of PTB in pregnant women with type I and type II, as well as gestational diabetes, has been reported in the literature in several countries.[32] A possible explanation could be hyperglycemia, insulin resistance, and increased oxidative stress, all of which can lead to endothelial dysfunction.[32] In addition, diabetes can indirectly increase the risk of PTB through preeclampsia, as this group of patients is more likely to develop preeclampsia.[32] Furthermore, due to the high risk of stillbirth in those groups of patients, some practitioners may opt for planned early-term delivery.[33]

Implementing mental health services in antenatal care clinics, including screening and effective interventions that target maternal depression, is vital to decrease morbidity and mortality associated with LBW. Pharmacological treatment of depression is restricted to a minority of pregnant women with severe depression. In contrast, psychological therapy may effectively mitigate depression symptomatology for most women with antenatal depression and thus improve pregnancy outcomes. [34]

Strength points in our study include an adjustment for potential confounders that may affect the interpretation of findings. There were several limitations. First, given the relatively small sample size of our sample, the findings cannot be generalized and need to be replicated in a larger study. Second, our exclusion of multiple gestation pregnancies (n=9) may have resulted in an underestimation of the LBW rate. Third, depression and birth outcome data for some women were based on self-report by patients, which may result in outcome misclassification. Future studies should aim to assess depressive symptoms across all trimesters to better understand changes in mental state and the impact of depression and anxiety exposure on adverse birth outcomes.

Conclusion

Depression during pregnancy increases the odds of giving birth to an LBW neonate by 3.64 (95% CI 1.70, 7.79) but not PTB. The independent impact of depression on LBW highlights the need to improve mental health service delivery to pregnant women to reduce mortality and the burden of diseases attributed to LBW. In contrast, anxiety is not associated with an increased risk of adverse birth outcomes.

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