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Effect of depressive disorders and other psychiatric disorders on pregnancy and perinatal outcomes in a Hong Kong obstetrics unit

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Objectives: To determine the prevalence of psychiatric disorders in Chinese pregnant women in Hong Kong, the effect of psychiatric disorders on pregnancy and perinatal outcomes, and the effect of antidepressants on pregnancy and perinatal outcomes.
Methods: We retrospectively reviewed medical records of women who delivered in Tuen Mun Hospital after 24 weeks of gestation between 1 January 2016 and 31 December 2017. Chinese pregnant women with psychiatric disorders were identified. Women with multiple pregnancy were excluded.
Results: Of 9049 Chinese pregnant women included, 216 (2.4%) reported psychiatric disorders, with depressive disorders being the most prevalent (1%). Compared to pregnant women with no psychiatric disorders, pregnant women with psychiatric disorders were more likely to have gestational diabetes (10.2% vs 5.7%, p=0.005) and/or pre-existing diabetes (4.2% vs 1.9%, p=0.018) and preterm births before 37 weeks (13.9% vs 7.5%, p=0.001). Similarly, women with depressive disorders were more likely to have gestational diabetes (11.4% vs 5.7%, p=0.022) and preterm birth before 37 weeks (13.6% vs 7.5%, p=0.031). In multiple logistic regression, pregnant women with psychiatric disorders or depressive disorders were associated with nearly two-fold increase in the risks of gestational diabetes mellitus and preterm birth before 37 weeks, after adjusting for cofounding factors.
Conclusion: Depression and psychiatric disorders were associated with preterm birth and gestational diabetes. Use of antidepressants had no adverse effect on maternal or fetal outcomes.

Keywords: Depression; Diabetes, gestational; Mental disorders; Premature birth

Introduction

Commonly encountered psychiatric disorders in pregnant women include depression, anxiety disorders, substance abuse, and schizophrenia-related disorders[1]. In meta-analyses, depression is estimated to complicate 12.8% and 12.0% of pregnancies in the second and third trimester, respectively, and increases the risks of preterm birth and low birthweight[2-5]. In a Caucasian-based meta-analysis, anxiety disorder increased the risks of preterm birth (odds ratio=1.54) and low birthweight (odds ratio=1.80)[6]. Nonetheless, there are limited data on the prevalence of psychiatric disorders in Asian pregnant women, particularly in Hong Kong populations. The available data mainly focus on the neonatal outcomes; data on pregnancy outcomes are scarce. Studies of antidepressant exposure during pregnancy have reported conflicting results about adverse delivery and perinatal outcomes[2,7]. Pregnant women are concerned about the possible harmful effects of psychiatric medications and thus compliance is low[8].

This study aims to determine the prevalence of psychiatric disorders in Chinese pregnant women in Hong Kong, the effect of psychiatric disorders on pregnancy and perinatal outcomes, and the effect of antidepressants on pregnancy and perinatal outcomes. The findings are useful for management and counselling of pregnant women with psychiatric disorders and to increase the awareness of healthcare workers on the possible risks in these women.

Methods

In the New Territories West Cluster, all pregnant women who report pre-existing mental illness, history of significant life event, postnatal depression, or other issues related to grief and loss leading to a higher risk of peripartum mental illness are assessed by the specialty nurses of the Comprehensive Child Development Service (CCDS) in the Maternal Child Health Centres or Tuen Mun

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Hospital obstetrics unit. In addition to routine antenatal care, these women are also followed up by the CCDS nurses. Their psychiatric diagnoses, concurrent follow-up by the psychiatrist, use of psychiatric medications, and compliance with psychiatric management are documented. They are assessed by the CCDS team after delivery to ensure good postpartum recovery and childcare.

This study was approved by the New Territories West Cluster Research Ethics Committee (reference: NTWC/REC/19031). We retrospectively reviewed medical records of women who delivered in Tuen Mun Hospital after 24 weeks of gestation between 1 January 2016 and 31 December 2017 using the Obstetrics Specialty Clinical Information System. Chinese pregnant women with psychiatric disorders were identified. Women with multiple pregnancy were excluded to minimise confounding effects on pregnancy and perinatal outcomes.

Data collected included maternal characteristics, antepartum complications (hypertensive disorders, gestational diabetes, pre-eclampsia, antepartum haemorrhage, preterm labour, and intrauterine fetal demise), peripartum outcomes (need for induction of labour, mode of delivery, postpartum haemorrhage), and fetal and perinatal outcomes (gestational age at birth, stillbirth, neonatal death, birth weight, Apgar scores, admission to neonatal unit).

Pregnant women with or without psychiatric disorders were compared using independent *t* test for continuous variables and Pearson Chi-squared test or Fisher's exact test for categorical variables. Multiple logistic regression analysis was used to determine the risks of psychiatric disorders for adverse pregnancy and perinatal outcomes, with adjustment of cofounding factors. A p value of <0.05 was considered statistically significant. Statistical analysis was performed using SPSS (Windows version 22; IBM Corp, Armonk [NY], US).

Results

Of 9049 Chinese pregnant women included, 216 (2.4%) reported psychiatric disorders, with depressive disorders being the most prevalent (1%) [Table 1].

Table 1. 216 pregnant women reporting psychiatric disorders during 2016-2017

Psychiatric disorder	No. (%) of pregnant women (n=9049)
Depressive disorders	88 (1.0)
Adjustment disorders	66 (0.7)
Substance abuse	35 (0.4)
Anxiety	27 (0.3)
Personality disorders	20 (0.2)
Schizophrenia	20 (0.2)
Bipolar affective disorders	6 (0.07)
Other psychiatric diseases (eating disorder and conduct disorder)	4 (0.04)
Mixed diagnoses	41 (0.5)

Compared with pregnant women with no psychiatric disorders, pregnant women with psychiatric disorders were more likely to be aged <20 years (4.2% vs 1.5%) or ≥35 years (29.6% vs 25%) [p=0.002], multiparous (60.6% vs 52.4%, p=0.016), have gestational diabetes (10.2% vs 5.7%, p=0.005) and/or pre-existing diabetes (4.2% vs 1.9%, p=0.018), and have preterm birth before 37 weeks (13.9% vs 7.5%, p=0.001) [Table 2]. Similarly, women with depressive disorders were more likely to be multiparous (65.9% vs 52.4%, p=0.011), have gestational diabetes (11.4% vs 5.7%, p=0.022), and have preterm birth before 37 weeks (13.6% vs 7.5%, p=0.031) [Table 2].

Among 88 pregnant women with depressive disorders, those on or not on antidepressants were comparable in terms of maternal characteristics and maternal and perinatal outcomes (Table 3).

In multiple logistic regression, pregnant women with psychiatric disorders or depressive disorders were associated with nearly two-fold increase in risks of gestational diabetes mellitus and preterm birth before 37 weeks, after adjusting for cofounding factors (Table 4).

Discussion

The prevalence of psychiatric disorders in pregnant women who delivered in Tuen Mun Hospital was 2.4%, which was lower than 15% to 29% reported in a US national survey[9]. This could be due to underreporting of mental health problems in our pregnant women despite detailed history taking during the antenatal care.

Pregnant women with depression or other psychiatric disorders were more likely to have gestational diabetes. Depression was the most prevalent psychiatric disorder. A prospective cohort study in the United States also observed a bidirectional association between depression and gestational diabetes mellitus[10]. This can be attributed to the positive association between depression and metabolic perturbations (such as increased oxidative stress, chronic

Table 2. Comparison of pregnant women with or without psychiatric disorder in terms of maternal characteristics and pregnancy and fetal outcomes

Characteristic	Pregnant women with no psychiatric disorder (n=8833)	Pregnant women with psychiatric disorder (n=216)	p Value	Pregnant women with depressive disorder (n=88)	p Value
Age, y			0.002		0.633
<20	136 (1.5)	9 (4.2)		2 (2.3)	
20-35	6490 (73.5)	143 (6.2)		61 (69.3)	
≥35	2207 (25)	64 (29.6)		25 (28.4)	
Parity			0.016		0.011
Primiparous	4207 (47.6)	85 (39.4)		30 (34.1)	
Multiparous	4626 (52.4)	131 (60.6)		58 (65.9)	
Body mass index, kg/m^2	24.13±4.26	24.11±4.97	0.995	23.28±4.55	0.556
Diabetes	669 (7.6)	31 (14.4)	<0.001	12 (13.6)	0.033
Gestational diabetes mellitus	500 (5.7)	22 (10.2)	0.005	10 (11.4)	0.022
Pre-existing diabetes mellitus	169 (1.9)	9 (4.2)	0.018	2 (2.3)	0.807
Pre-eclampsia	60 (0.7)	3 (1.4)	0.215	2 (2.3)	0.073
Hypertension	167 (1.9)	6 (2.8)	0.347	3 (3.4)	0.300
Antepartum haemorrhage	607 (6.9)	13 (6)	0.624	3 (3.4)	0.200
Intrauterine fetal demise	25 (0.3)	0 (0)	0.434	0 (0.0)	0.617
Induction of labour	2676 (30.3)	63 (29.2)	0.721	25 (28.4)	0.702
Mode of delivery			0.287		0.150
Vaginal delivery	5877 (66.5)	138 (63.9)		52 (59.1)	
Instrumental delivery	551 (6.2)	10 (4.6)		4 (4.5)	
Caesarean section	2405 (27.2)	68 (31.5)		32 (36.4)	
Postpartum haemorrhage	451 (5.1)	9 (4.2)	0.535	3 (3.4)	0.471
Intrauterine growth restriction / small for gestational age	574 (5.6)	15 (6.9)	0.793	8 (9.1)	0.327
Preterm birth before 37 weeks	665 (7.5)	30 (13.9)	0.001	12 (13.6)	0.031
Preterm birth before 34 weeks	196 (2.2)	7 (3.2)	0.316	2 (2.3)	0.973
Apgar score <7 at 1 min	290 (3.3)	7 (3.2)	0.972	4 (4.5)	0.509
Apgar score <7 at 5 min	53 (0.6)	1 (0.5)	0.796	0 (0.0)	0.466
Neonatal intensive care unit admission	192 (2.2)	6 (2.8)	0.549	3 (3.4)	0.430
Neonatal death	10 (0.1)	0 (0)	0.621	0 (0.0)	0.752

* Data are presented as mean±standard deviation or No. (%) of pregnant women

inflammation, and insulin resistance), which subsequently contribute to the development of hyperglycaemia[11]. Healthcare workers should be more vigilant for gestational diabetes mellitus in women with depression or other psychiatric disorders.

Depression in pregnancy is associated with preterm births[3,12-14]. The underlying mechanism is not well understood, but it is hypothesised that stress leads to activation of inflammatory pathways involving maternal cortisol that results in premature delivery[15,16]. Hence, pregnant women with psychiatric disorders should be advised on the increased risk of preterm birth and on signs and symptoms of preterm labour for timely management.

In our study, use of antidepressants was not associated with adverse change in pregnancy and perinatal outcomes. Hence, pregnant women with psychiatric

Table 3. Comparison of pregnant women with depressive disorder on or not on antidepressants in terms of maternal characteristics and pregnancy and fetal outcomes

Characteristic	On antidepressants (n=36)	Not on antidepressants (n=52)	p Value
Age, y			0.374
<20	0	2 (3.8)	
20-35	24 (66.7)	37 (71.2)	
≥35	12 (33.3)	13 (25.0)	
Parity			0.901
Primiparous	12 (33.3)	18 (34.6)	
Multiparous	24 (66.7)	34 (65.4)	
Body mass index (kg/m^2)	23.8±4.01	22.89±5.50	0.819
Diabetes mellitus	7 (19.4)	5 (9.6)	0.186
Gestational diabetes mellitus	6 (16.7)	4 (7.7)	0.192
Pre-existing diabetes mellitus	1 (2.8)	1 (1.9)	0.791
Pre-eclampsia	1 (2.8)	1 (1.9)	0.791
Hypertension	2 (5.6)	1 (1.9)	0.356
Antepartum haemorrhage	1 (2.8)	2 (3.8)	0.786
Intrauterine fetal demise	0	0	-
Induction of labour	11 (30.6)	14 (26.9)	0.710
Mode of delivery			0.830
Vaginal delivery	20 (55.6)	32 (61.5)	
Instrumental delivery	2 (5.6)	2 (3.8)	
Caesarean section	14 (38.9)	18 (34.6)	
Postpartum haemorrhage	2 (5.6)	1 (1.9)	0.356
Intrauterine growth restriction / small for gestational age	2 (5.6)	6 (11.5)	0.337
Preterm birth before 37 weeks	5 (13.9)	7 (13.5)	0.954
Preterm birth before 34 weeks	1 (2.8)	1 (1.9)	0.791
Apgar score <7 at 1 min	1 (2.8)	3 (5.8)	0.508
Apgar score <7 at 5 min	0	0	-
Neonatal intensive care unit admission	2 (5.6)	1 (1.9)	0.356
Neonatal death	0	0	-

* Data are presented as mean±standard deviation or No. (%) of pregnant women

Table 4. Multiple logistic regression for risk factors

Variable	Adjusted odds ratio (95% confidence interval)	
	Pregnant women with psychiatric disorders*	Pregnant women with depressive disorder*
Gestational diabetes mellitus	1.84 (1.17-2.91), p=0.008	2.01 (1.07-4.12), p=0.031
Preterm birth before 37 weeks	1.91 (1.29-2.84), p=0.001	1.88 (1.02-3.48), p=0.045

* Comparison with 8833 pregnant women with no psychiatric disorder

disorders should be reassured that antidepressants do not have detrimental effects on pregnancy. They should be advised to continue the medication if indicated according to psychiatrist.

One limitation of this study was its retrospective nature. Some socioeconomic factors such as smoking status and family income could not be retrieved from the system. Recognition of psychiatric disorders relied on self-reporting and therefore the true number of affected patients might be under-reported[17]. Nonetheless, under-reporting exists even in prospective studies if stigmatisation of psychiatric disorders remains unchanged. The sample size was too small to determine the effect of psychiatric medication on pregnancy outcomes.

Conclusion

Depression and psychiatric disorders were associated with preterm birth and gestational diabetes. Use of antidepressants had no adverse effect on maternal or fetal outcomes.

Declaration

The authors have no conflict of interest to disclose.

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