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Abstract

Background : Maternal mental health is a very important issue. A great proportion of pregnant women are at risk of antenatal depression. Hospital admission would be a contributing factor to develop depression.

Objectives: To determine the association between hospital admission and maternal depression among pregnant women.

Study design: This cross- sectional study was conducted at the obstetrics and gynecology department at a tertiary hospital. The study recruited hospitalized pregnant women for variable causes. A control group including women attending for routine antenatal care was recruited. Screening for depression was done using Arabic validated form of the Edinburgh Postnatal Depression Scale. Comparison between both groups was done regarding depression scores, prevalence of depression, and suicidal thoughts.

Results: There was no difference between both groups but for employment, BMI, and parity. The study group was admitted for a mean duration of 7.3 ± 3.3 days. Only 1 patient (0.9%) in the study group had previous history of depression. The depression score was significantly increased among hospitalized women (13.24 ± 5.01) than the control group (10.32 ± 5.65) (p value 0.0001). High scores denoting depression was evident in a great proportion of the study group (52.8%) than the control group (29.3%). Suicidal thoughts were more prominent in the study group (52.8%) compared to the control group (28.5%) (p value 0.0001). None of the patients' related factors was associated with depression scores (P value > 0.05).

Conclusions: Maternal depression occurred in a great proportion among hospitalized women.

Key words: depression; pregnancy; hospital admission.

Introduction

Antepartum depression is a serious health problem affecting mothers with an incidence of 7-13% (1). Multiple risk factors were encountered including family history of depression, young maternal age < 20, multiparity (more than 3 children), smoking, intimate partner violence, low socioeconomic state, and low educational level (2). It is also associated with adverse maternal and neonatal outcomes as preterm birth, low birth weight, altered neonatal development, and altered childhood growth (3). It leads to impaired maternal-fetal bond which affects proper parenting (4) as well as increased future risk of depressive attacks (5). There is also increased risk for instrumental delivery, emergency cesarean delivery (6), low birth weight (7), and preterm delivery (8).

High risk pregnancies and hospital admission increased the risk of depression (9, 10)with an incidence of 32% among hospitalized patients (11) and the risk increased to 44% among pregnant women hospitalized in high-risk units (12). It has been reported that antepartum depression is commonly undiagnosed without intended screening, with recommendations for screening at least once during the peripartum period (13, 14). However; this is not applied universally which leads to misdiagnosed cases (15). Additionally, psychiatric consultation for inpatient obstetric cases was available for only 1.6% of cases (16). Few studies reported on the prevalence of depressive symptoms among hospitalized women with high- risk pregnancies. This study aimed to determining the association between hospital admission and maternal depression among hospitalized pregnant women.

Methods

This cross- sectional study was conducted at the obstetrics and gynecology department, at Suez Canal University hospital. The study recruited pregnant women admitted in the ward fulfilling the following inclusion and exclusion criteria. Inclusion criteria: a) patients' age 18-45 years, b) pregnant women of any gestational age, and c) singleton pregnancy. Exclusion criteria: a) any patient refusing to participate in the study, and b) women admitted because of fetal demise. A control group was recruited from the outpatient clinic including women attending for routine antenatal care.

After obtaining consent for participation in the study, eligible women were asked to fill in a self-administered questionnaire to determine depression. A researcher was available for help with illiterate women. Depression was evaluated using Arabic validated form of the Edinburgh Postnatal Depression Scale (EPDS). The scale comprises 10 questions that represent patients' feelings in the last seven days. Each question has multiple choices for answering it. Questions 1, 2, and 4 are scored 0, 1, 2, or 3 with the top choice scored as 0 while the last one as 3. Questions 3, 5-10 are reverse scored with the top choice scored as 3 while the last one as 0. The maximum score is 30. Scores are interpreted as follows: a score less than 8 as depression is not likely, a score of 9-11 as depression is possible, a score of 12-13 as fairly high possibility of depression, and a score ≥ 14 as possible depression. Each situation was dealt with according to the recommendations of the reproductive health program (17, 18).

The sample size was calculated at a significance level of 99% and an error level of 20%, with a prevalence of probable depression among non-hospitalized pregnant women as 49% (19) and high possibility of depression in hospitalized women as 24% (20). After adding 10% drop out, the sample was 99 pregnant women per group.

Ethical approval: This study was conducted after approval of the research ethics committee at Faculty of Medicine, Suez Canal University on 29/11/2021 with a number of 4735.

Statistical Analysis

Data were statistically described in terms of mean and standard deviation, frequencies (number of cases) and percentages when appropriate. P values less than 0.05 was considered statistically significant. All statistical calculations were done using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) release 23 for Microsoft Windows. Chi-square test was used for categorical variables and (t) test for continuous variables with normally distributed data. Regression analysis was done for the variables predicting increased depression scores.

<u>Results</u>

One hundred eleven and 125 women were eligible for the study and control groups. Three and 2 women declined to participate in each group respectively. This resulted in 108 and 123 women included in the final analysis in the study and control groups respectively.

There was no difference between both groups but for employment, BMI, and parity. A great proportion of the control group was employed (30.1%) rather than the study group (21.3%). They have lower BMI (27.5 \pm 3.9) than the study group (28.9 \pm 5.7) (p value 0.028). the study group had a significantly increased parity (1.9 \pm 1.5) than the control group (0.7 \pm 0.4) (p value 0.0001) (Table 1). None of the recruited patients had history of alcohol intake or smoking.

The study group was admitted for a mean duration of 7.3 ± 3.3 days. The most prevalent cause for admission was preeclampsia (25.9%) followed by hyperemesis gravidarum (17.6%). 52.8% of the study group delivered during their admission. The most prevalent postpartum complication was meconium aspiration syndrome (19.3%) followed by established preterm birth (14%) (Table 2).

Only 1 patient (0.9%) in the study group had previous history of depression. The depression score was significantly increased among hospitalized women (13.24 ± 5.01) than the control group (10.32 ± 5.65) (p value 0.0001). high scores denoting depression was evident in a great proportion of the study group (52.8%) than the control group (29.3%). Suicidal thoughts were more prominent in the study group (52.8%) compared to the control group (28.5%) (p value 0.0001) (Table 3).

Using multivariate regression analysis, none of the patients' related factors was associated with depression score (Table 4).

Discussion

A great proportion of the control group was employed rather than the study group. An earlier study reported that almost half (55%) of the hospitalized women were unemployed at admission (20). About two-thirds of both groups reported middle education or less. This agreed with previous results where 56% of the participants had high school education or less (20). One patient in the study group had previous history of depression. This contradicted previous results where 47% of the studied population had previous history of depression or anxiety (20). This discrepancy would be rendered to different ethnic groups as they recruited African American (51%), while the current study recruited women of the same ethnicity. Also, a proportion (21%)of them reported history of intimate partner violence, while this was not evaluated in the current study. Additionally, 31% of their studied population were married, while all of our studied population were married.

The study group was admitted for a mean duration of 7.3 ± 3.3 days. Another study reported a mean hospital stay of 10 days (20). The most common cause of admission was prematurity issues (46%) (20), while pre-eclampsia was evident in the current study. It has been reported by a meta-analysis that 18% of the included population were evaluated immediately upon admission, while 34% were evaluated after 3 days. While more than half of the studies did not mention the timing of screening relative to hospital admission. This would reflect the nature of prehospitalization mental illness, rather than relation to hospitalization (21).

In the study group, 72.2% scored \geq 12. This

was markedly elevated than the results reported earlier as 24% of the participants scored \geq 12 (20). Other studies reported scores \geq 13 in 32.9% (22) and \geq 10 in 28.3% of their participants (23). One patient in the study group reported to have previous history of depression, while another study reported no history of depression in their studied population (24). This would be related to social fears from reporting having mental illness (22). The depression score was significantly increased among hospitalized women than the control group. High scores denoting depression were evident in a great proportion of the study group than the control group. This would be explained by the effect of frustration due to having a high-risk pregnancy (22). This striking increase in rate of depression among hospitalized women would be explained by the different races, as it has been mentioned that Muslim Bedouin women were more liable to depression than Jewish (23). This was rendered to their suffering from domestic violence due to increased parity and other additional factors (24). Although, the current study recruited Arab Muslim women, they were of the same ethnic group without recruitment of Bedouin. Additionally, domestic violence was not evaluated. Other contributing factors might include poverty, lack of social support, and neglect (23). Additionally, lack of privacy would result in underreporting which contributed to the great difference in depression rates (23).

Also, insufficient evaluation of pre-pregnancy mood disorders in previous studies would affect the cumulative rate of depression reported by different studies. Additionally, different cultural believes would affect symptom reporting because of fear of mental illness stigma. Different cut off values was noted between studies which relatively affects the rates of depression. The use of EPDS which is considered as a screening tool would result in overestimation of depression rates (21).

Suicidal thoughts were more prominent in the study group (52.8%) compared to the control group (28.5%). An earlier study reported that only 2 women (2.7%) of their participants had suicidal thought (21). These variable results would be rendered to different tools used to evaluate depression among studies, different sample size, recruitment of women with certain adverse pregnancy disorder only (FGR) (21), exposure to other factors as low income, unemployment, unstable marital status (25), and increased alcohol intake and smoking (26).

None of the patients' related factors was associated with depression scores. This contradicted previous results where depression was associated with maternal smoking and the gestational age on admission. However; this study recruited pregnant women with FGR only (22). Another study reported that maternal depression was associated with preterm delivery (23), however; the association between pregnancy outcomes and depression was not evaluated in the current study.

Strength and limitations: This was the first study in Egypt to evaluate the association between hospital admission and maternal depression. The sample size was relatively small. The association between maternal depression and adverse pregnancy outcome was not evaluated. The questionnaire was administered to women privately in the absence of her relatives to give her the chance to express her feelings. The duration of hospitalization was mentioned to avoid bias from possible preadmission mental illness. We used EPDS which is a screening tool and definitive diagnosis was not mentioned.

Conclusion: Maternal depression occurred in a great proportion among hospitalized women.

Conflict of interest: None

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		Study group (N= 108)	Control group (N= 123)	P value
Age (years) (N	Mean ± SD)	29.4 ± 7.5	28.7 ± 5.7	0.452
Education N (%)	None	34 (31.5%)	25 (20.3%)	
	Middle	48 (44.4%)	62 (50.4%)	0.149
	High	26 (24.1%)	36 (29.3%)	
Job N (%)	Housewife	85 (78.7%)	86 (69.9%)	0.0001
	Employee	23 (21.3%)	37 (30.1%)	0.0001
BMI (kg/m ²)	(Mean ± SD)	28.9 ± 5.7	27.5 ± 3.9	0.028
Parity (Mean ± SD)		1.9 ± 1.5	0.7 ± 0.4	0.0001
GA (weeks) (Mean ± SD)		28.7 ± 11.3*	30.2 ± 7.9	0.263

Table 1: Basic demographic data of the studied population:

*Gestational age at admission, BMI: body mass index, GA: gestational age

Table 2: Admission data of the study group

Duration of admission (Days) (Mean ± SD)		7.3 ± 3.3
	Antepartum hemorrhage	11 (10.2%)
	Acute urinary tract infection	6 (5.6 %)
	Uncontrolled hypertension	2 (1.9%)
	Hyperemesis gravidarum	19 (17.6%)
	preeclampsia	28 (25.9%)
	Uncontrolled diabetes	17 (15.7%)
Cause of admission	Ectopic pregnancy	3 (2.8%)
N (%)	Premature rupture of mem- branes	14 (12.9%)
	Preterm labor	9 (8.3%)
	Placenta previa	1 (0.9%)
	Placenta accreta	3 (2.8%)
	Eclampsia	1 (0.9%)
	Diabetic ketoacidosis	1 (0.9%)
Delivered N (%)	Yes	57 (52.8%)
	No	51 (47.2%)
	Postpartum hemorrhage	5 (8.8%)
	Blood transfusion	6 (10.5%)
	Superimposed preeclampsia	2 (3.5%)
Destu autom someliastions	Preterm birth	8 (14%)
N (%)	Septic wound	2 (3.5%)
	Meconium aspiration syndrome	11 (19.3%)
	Neonatal hypoglycemia	4 (7%)
	Bladder injury	3 (5.3%)
	Neonatal tachypnea	1 (1.8%)

Mode of delivery N (9/)	Vaginal delivery	12 (21.1%)
Nide of derivery in (78)	Cesarean delivery	45 (78.9%)
Fetal weight (grams) (Mean ± SD)		2926.6 ± 659

Table 3: Depression scores between both groups

		Study group (N= 108)	Control group (N= 123)	P value
Depression score	e (Mean ± SD)	13.24 ± 5.01	10.32 ± 5.65	0.0001
	No depression	20 (18.5%)	47 (38.2%)	
Depression	Possible depression	10 (9.3%)	19 (15.4%)	0.0001
N (%)	High possibility of depression	21 (19.4%)	21 (17.1%)	0.0001
	Depression	57 (52.8%)	36 (29.3%)	
Suicidal	No	51 (47.2%)	88 (71.5%)	0.0001
thoughts N (%)	Yes	57 (52.8%)	35 (28.5%)	0.0001

Table 4: Multivariate regression analysis for the factors associated with depression score

	β	95% confidence interval	P value
Age	0.077	-0.114- 0.268	0.424
Education	-0.496	-1.999- 1.006	0.514
Job	1.463	-1.275- 4.201	0.292
BMI	-0.040	-0.241- 0.161	0.693
Parity	0.521	-0.369- 1.410	0.248
GA	0.074	-0.020- 0.168	0.122
Duration of admission	-0.100	-0.382- 0.181	0.481