

Association of Post-Partum Depression (PPD) with Anaemia and Vitamin D Deficiency

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Abstract:

Background: Postpartum depression (PPD) affects about 15% of mothers. It is a serious disorder that may affect physical and mental health of new mothers and newborns. Mothers suffering from anemia and vitamin D deficiency may be at increased risk of developing PPD.

Aim: Our study aimed to detect the association of anaemia and Vit D deficiency with postpartum depression & also to look at association of other maternal and perinatal complications.

Materials & methods: In this cross sectional observational study, pregnant women having anemia (Hb% <11gm/dl), were grouped as A (n=141), pregnant women having low Vit D were grouped as B (n=28), and pregnant women with normal Hb% and normal Vit D were grouped as group C (n=58). A & B were taken as cases and group C was taken as control in the study. Depression was evaluated by using Edinburg postnatal depression rating scale, P <0.05 was taken as statistically significant. Also secondary outcome like PPH, wound infection, Apgar score, preterm birth neonatal admission were noted down.

Introduction

Postpartum depression (PPD) is a devastating condition for the woman and the family and their newborn. During this time a family deserves happiness for the arrival of new member but PPD destroys this happiness. The classic symptoms of PPD are depressed mood, anxiety, loss of appetite and sleep disturbances, physical

Results: Depression was found significantly higher in both A= 60.3% and B =14.2%, than group C =0% (p<0.0001). Postpartum hemorrhage (PPH) and wound infection were found higher for group A (58% & 13%), Group B (28 & 3%) respectively than control group C (5 & 2%). Interestingly all women with VitD deficiency had postpartal haemorrhage (PPH). Regarding neonatal outcome, APGAR score was low in A (38%) and B (10.7%) in compare to control group C (0%). NICU Admission was seen higher in A=26% & B=10.7% than for C=0%. Incidence of Preterm birth (PTB) for A =25% & B= 2% were significantly higher than group C= 0%. No stillbirth was found in any group.

Conclusion: Prevention, identification and treatment of anaemia and Vitamin D deficiency in pregnant women seem necessary, as they are strongly associated with postpartum depression and other complications.

Keywords: Postpartum depression (PPD), anemia, hemoglobin and vitamin D.

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agitation, fatigue, feelings of worthlessness and excessive guilt, decreased concentration and recurrent thoughts of death or suicidal thought.¹ Depressive symptoms during and after pregnancy are associated with unfavorable outcomes for mothers and their infants. Many studies showed that depression has short-term and long-term effects including high-risk behaviours, preeclampsia, low birth weight, prematurity, small head circumference and increased PPD.²⁻⁴ Additionally, depression during and after pregnancy is also related to a range of other negative outcomes such as social isolation,⁵ marital conflicts,⁶ delayed motor skills or intellectual development in the infant,⁷ embryonic growth restriction, and high stress response in new born at delivery.^{8,9}

Many women develop suicidal tendency and have thought of harming their infant during postnatal period. So it is very important for health professionals to be proactive to enquire about whether a postnatal woman has been experiencing thoughts of harming herself or

her baby, regardless of the reason why she has presented.¹⁰

The association between anaemia and postpartum depression (PPD) has been reported to be controversial in different studies. We know anaemia is one of the most important public health issues worldwide, which has a great impact on the physical and mental ability of pregnant women. The prevalence of anaemia in pregnant women is affected by geographical region, lifestyle, and diet, and it is reported to be between 14-80% in different societies.¹¹⁻¹² Various studies have investigated the association between anaemia and PPD but the results of these studies are diverse.¹³⁻¹⁸

Similarly, Vitamin D has been associated with postpartum depression (PPD) in many studies; some results did not show any significant association, some studies showed there are association. Generally active form of Vitamin D, is 25-hydroxy-cholecalciferol, which has important role in maintaining bone mass density. It has also important role in reproduction, fertility, immunity and mental health.¹⁹

Both anemia and VitD deficiency are modifiable risk factors in pregnancy; health care providers should encourage pregnant women to have those supplements regularly. The study of Brockington et al mentioned, early detection and treatment of PPD should be of high public health priority to prevent negative outcomes for both mothers and children.²⁰ According to the World Health Organization (WHO), globally 13-15% of women experience postpartum depression and this number reaches 19.8% in developing countries.²¹ In Bangladesh studies, on prevalence of PPD are less, but the study by Azad et al showed in the slum areas the prevalence of PPD was 39.4% within first 12 months following the child birth.²² Also Sheikh Jamal et al reflected that the prevalence of depressive symptoms was 51.7% in community of rural area of Bangladesh, which is significantly high.²³

Therefore, our study aimed to provide a comprehensive assessment of association of anaemia & Vit D deficiency with PPD in our society at the same time as secondary outcomes we tried to look at some other maternal and perinatal complications associated with this deficiency state.

Methods:

This was a Cross sectional study, carried out from ZHSWMCH & Medinova consultation center. In this

cross sectional observational study, pregnant women having anemia (Hb% <11gm/dl), were grouped as A (n=141), pregnant women having low VitD were grouped as B (n=28), and pregnant women with normal Hb% and normal Vit D were grouped as C (n=58). A & B were taken as case and group C was taken as control in the study. Postnatal Depression was evaluated by using Edinburg postnatal depression rating scale, $P < 0.05$ was taken as statistically significant. Also secondary outcome like PPH, wound infection, Apgar score, preterm birth neonatal admission were noted down. For the study purposive sample was taken. Women having any complications like Preeclampsia, Gestational diabetes, Pulmonary TB, prolong infertility, previous psychological disturbances, were excluded from the study.

Pregnancy of third trimester onward and who came at delivery were included, they all were interviewed at 6 weeks postnatal, and were requested to answer the 10 questions of the Edinburgh Postnatal Depression rating scale (Edinburgh Postnatal Depression Scale, Perinatology.com <https://perinatology.com> > Calculators) to assess the risk of their depression. While questioning, we used the same scale but translated into Bengali if it was necessary. We interviewed them to answer that which was most close to their feeling such as- question No.1. You have been able to laugh and see the funny side of things in the past 7 days, women needed to tick the following, most suitable they thought.

As much as I always could=0

Not quite so much now=1

Definitely not so much now=2

Not at all=3

Each answer is given a score of 0 to 3. The maximum score is $10 \times 3 = 30$. The score of 10 or more was identified as suffering from depression.

Primary outcome was analyzed for postnatal depression. As anemia and Vit D deficiency are associated with other maternal and perinatal complications so we tried to find out secondary outcomes for both mother and neonates. Such as we looked at the incidence of PPH, Wound infection, preterm birth, Apgar score & NICU (Neonatal intensive care unit) admission. Women who were found having depression, were referred to psychiatrist for the proper management. The data was analyzed by SPSS

version 18 Chicago USA. Measures of variability was done as median and & 95% confidence interval. CI is the range around a sample mean within which we predicted the means of the sample's population.

Variability like anemia, vitamin D deficiency, and postnatal depression was mentioned in the table as median & 95% CI. The χ^2 expressed as mean and standard deviation. Test was standardized and applied when evaluating the association between variables. $P < 0.05$ was taken as statistically significant. Data was collected from patients-face to face by a standard questionnaire.

Ethical clearance

Written informed consent was taken from each patient. Ethical clearance was done from ethical committee of Z.H. Sikder women's medical college hospital, Ref. No Institutional ethical committee no -:ZHSWMC&H/2019/363.

Result:

Significant symptoms of postpartum depression were seen in both anemia and VitD deficiency group of pregnant women.

Table-I

<i>Baseline demographic characteristics</i>				
Variables	Group A N=141	Group B N=28	Group C N=58	p-value
Age	25.00 (24.05-27.68)	27.00 (24.32-28.96)	29 (27.18-30.54)	0.013
Parity				
Primae	63(44.6%)	14(50.00%)	19(33.7%)	0.290
Multi=2	38(26.95%)	9(32.1%)	23(39.6%)	
Others	40(28.45%)	5(17.9%)	16(27.6%)	
BMI				
Low weight	19(13.5%)	1 (3.6%)	5(8.6%)	0.030
Over weight	49(35.0%)	8(28.6%)	11(19.0%)	
Normal	51(70 %)	9 (32%)	25(43.1%)	
Obesity	22(13.5)	10 (35.7%)	17(29.3%)	

All women were from young reproductive Age group between 24 to 30 years. Maximum women were primae gravid. There was no gross difference of BMI (Body mass index) among the three groups.

Table-II

<i>Incidence of anemia (Group A) & of Vit D (Group B)</i>		
	Group A gm/dl	Group C gm/dl
Anaemia	8.80(+0.97)	11.30(+0.50)
	Group B	
Vit D	21.85(+2.90)	50.56(+10.56)

Group A had average Hb% 9gm/dl (SD 7.0-9.5)

Group B had Vit D deficiency average 21.85 (SD+2.90)

Table-III

<i>Maternal outcomes</i>				
Events	Group A N=141	Group B N=28	Group C N=58	p-value
Depression	85 (60.3%)	4 (14.2%)	0 (0%)	<0.001
Postpartal haemorrhage	82 (58%)	28 (100%)	5 (2.9%)	<0.0001
Wound Infection	13(9.2%)	3 (1)>&%)	2 (3.4%)	<0.001

Table-IV

<i>Perinatal outcome</i>				
Events	Group AN=141	Group BN=28	Group CN=58	p-value
NICU Admission	11(7.8%)	1(3.6%)	0(0.0%)	<0.0001
Apgar score <7 in 5min	38 (26.0%)	3 (10.7%)	0(0.0%)	<0.0001
Preterm Baby	22 (15.0)	2 (7.07)	0(0.0)	

Depression was found significantly higher in both A= 60.3% and B =14.2%, than group C =0% (p<0.0001). PPH and wound infection were found higher for group A (58% & 13%), B (28 & 3%) respectively than control group C (5&2%) p value <0.0001. Interestingly all women with VitD deficiency had incidence of PPH. Regarding perinatal outcome, APGAR score was low in A (38%) and B (10.7%) in compare to control group C (0). NICU Admission was seen higher in A=26% & B= 2%, significantly higher than group C= 0% p<0.0001.

Discussion:

So this is very important issue to prevent PPD by all cost to save our mothers that jeopardies their lives.

Our Study clearly showed that Pregnancy with anemia had higher incidence of PPD, though huge controversy exists. We found incidence of PPD is significantly higher in pregnant women with anaemia. Similarly, meta-analysis by Milad Azami showed anaemia during pregnancy and after pregnancy significantly increased the risk of postpartum depression.²⁴ Wassef et al had literature search which reflected, anaemia and/or iron-deficiency may contribute to PPD in at-risk women.²⁵ On the contrary Nirmala and et al did not agree that, anemia is the independent factor for PPD.²⁶

The study from other researchers reported -no correlation between low hemoglobin levels and high score for Edinburgh post-partum depression (EPDS) scale.²⁷ But by Yuto Maeda clearly showed that anaemia was associated with an increased risk of PPD²⁸ which is similar to our findings.

Shutherlandand et al showed anaemia during pregnancy or in peuperium is associated with an increased incidence of PPD and they commented that anaemia should be investigated as a potential risk factor for PPD.²⁹ Parvin Abedi in her study showed, there is a significant relationship between a low level of vitamin D and

postpartum depression among reproductive-aged Iranian women.³⁰

A study on 687 pregnant women showed that pregnant women who had low levels of 25-OH vitamin D were more prone to have postpartum depression.³¹ Interestingly though not PPD but the study by Anne Williams J showed that women who had a low-level vitamin D in early pregnancy were at a greater risk for depression in mid and late pregnancy.³² In contrast, Nielson et al had study where 605 women with PPD were taken for a case study and 875 women were taken as control they tried to found any association of PPD and VitD deficiency but they could not found any significant relationship between vitamin D deficiency and PPD.³³ Vikash Menon had review article, which commented serum vitamin D levels inversely correlate with clinical depression, but the evidence is not strong enough to recommend universal supplementation in depression.³⁴

Amanda Ribamar et al had a review article, where they mentioned that there is a probable relationship between VitD deficiency and a higher predisposition to gestational and postpartum depression. Also they showed vitamin D supplementation had proven to be a promising strategy for reducing the risk of depressive symptoms.³⁵

The Endocrine Society recommends routine vitamin D supplementation during pregnancy and lactation due to increased metabolic demand in the mother, but we tried to search Cochrane review where we did not find any recommendation for routine Vit D screening in pregnant women.³⁶ Having lots of controversies regarding Vit D screening, our study showed that Vit D deficiency is associated with PPD so it could be in routine program. Therefore, it is high time to have more evidence-based research to recommend Vit D estimation & supplementation during pregnancy in Bangladesh.

Conclusion:

Prevention, identification and treatment of anaemia and Vitamin D deficiency in pregnant women seem necessary. Health care providers should pay attention to the measuring vitamin D level along with anaemia as one of the primary tests of pregnant women.

Vitamin D & iron supplementations are relatively safe and cost-effective interventions during pregnancy, therefore we recommend to investigate and treat all pregnant women for Vit D deficiency along with anaemia to prevent many complications particularly PPD.

Declaration of interest

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