

Association of Anemia with Postpartum Mood Disorders

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Abstract: Introduction: Anemia is an important global health issue which has a great impact on mental health. Postpartum depression is an important risk factor for suicide, a major cause of death in postpartum women worldwide. Objective: To determine the association of anemia in development of postpartum mood disorders. Methods and materials: This comparative study was conducted in the Department of Obstetrics and Gynaecology at Sree Balaji Medical College and hospital. 150 postnatal mothers who delivered by full term normal vaginal delivery were included in this study. Their hemoglobin levels were checked postnatally at 48hrs. They were categorized into anaemic and non anaemic. A Questionnaire based on Edinburgh postpartum depression scale was given to assess the mental status of the postpartum mothers. They were assessed periodically during each postnatal visit. They were followed up once in 2 weeks, until 6 weeks postpartum. Result: Out of 150 women assessed for maternal behavioral symptoms in postpartum period based on their iron status, women with anemia who developed postpartum blues and postpartum depression were about 60% and 30% respectively, while 10% did not develop any postpartum mood disorders. Anemia in postpartum period was significantly associated with increased risk of PPD. In contrast, no significant association was found between anemia and development of postpartum psychosis. Conclusion: Postpartum mood disorders was significantly higher in anaemic women versus non-anaemic women. The main causes are not yet known. Considering the negative consequences of depression on mother, her offspring & whole family, diagnosis of anaemia should be an essential part of maternity care during pregnancy and after delivery.

1. Introduction

Anemia is one of the most important public health issues worldwide, which has a great impact on the physical, mental health. The most common type of anemia is Iron deficiency anemia. Maternal iron requirements usually rise during pregnancy. Postpartum period, defined as the period beginning just after childbirth till the subsequent 6 weeks, is the most crucial time to restore iron lost during pregnancy and delivery. Maternal iron stores are one of the strongest predictors of postpartum anemia as iron stores tend to remain low for several months after childbirth, especially if there is significant blood loss during the delivery and if iron supplements are not taken regularly.

Postpartum anemia is a major health problem with prevalence of 50 to 80% of women present with anemia within 48 hours of postpartum. Postpartum anaemia is caused by postpartum haemorrhage in women without anaemia during pregnancy. The level of Hb is expected to increase in the first week postpartum as the physiological haemodilution disappears and thus the body's iron reserves become more available. However, anaemia becomes much commoner problem because postpartum Hb levels are influenced mainly by two circumstances: Gestational anemia and the magnitude of peripartum blood loss, where haemorrhage is the most frequently associated cause of puerperal anemia. Postpartum anemia is responsible for major repercussions on the health of both mothers and newborns with higher prevalence of complications such as infection, delayed wound healing, anxiety leading to postpartum psychiatric problems which includes postpartum blues, postpartum depression and postpartum psychosis. These alterations in the mother's emotional and cognitive functioning may, in turn, affect her interactions

with the infant and may negatively impact infant behaviour and development. Therefore if the iron stores are not restored soon after childbirth with iron supplements, this can lead to continued adverse maternal and infant outcomes.

The prevalence of postpartum depression is 10-15%. It is an important risk factor for suicide. It is a major cause of death in postpartum period.

Aim: The aim of the study is to determine the association of anemia in development of postpartum depression.

Objective: To assess the development of cognitive dysfunction in postpartum mothers based on their Haemoglobin level.

2. Methods and Material

An observational cross sectional study was conducted with sample size of 150 women who delivered in Sree Balaji Medical College and hospital Chennai from the month of August 2020 to the month of November 2020. A baseline survey including maternal demographic was conducted and first postpartum survey which included assessment of maternal haemoglobin at 48hrs of delivery. Blood samples were collected in Ethylene Diamine Tetraacetic Acid (EDTA) and Haemoglobin estimation was done by Sahli's Haemoglobinometer method. They were divided into anaemic and non-anaemic based on hemoglobin levels of <10g/dl and >10g/dl respectively according to WHO criteria. Inclusion criteria includes all term patients. The exclusion criteria were maternal psychiatric illness, use of antidepressant medication, consumption of smoking or alcohol, and family history of depression.

Maternal age, Socioeconomic status, BMI, Type of family, parity, symptomatology were retrieved from medical records were treated as continuous variables.

EPDS score of more than 9 was considered as postpartum depression.

They were followed up every 2 weeks till 6 weeks postpartum, and their mental status was assessed using EDINBURGH POSTPARTUM DEPRESSION SCALE. EPDS was used to classify the postpartum psychiatric illness into postpartum blues, postpartum depression, postpartum psychosis.

The EPDS is a 10-item questionnaire. Women are asked to answer each question in terms of the past seven days.	
1. I have been able to laugh and see the funny side of things	As much as I always could (score of 0) Not quite so much now (score of 1) Definitely not so much now (score of 2) Not at all (score of 3)
2. I have looked forward with enjoyment to things	As much as I ever did (score of 0) Rather less than I used to (score of 1) Definitely less than I used to (score of 2) Hardly at all (score of 3)
3. I have blamed myself unnecessarily when things went wrong	Yes, most of the time (score of 3) Yes, some of the time (score of 2) Not very often (score of 1) No, never (score of 0)
4. I have been anxious or worried for no good reason	No, not at all (score of 0) Hardly ever (score of 1) Yes, sometimes (score of 2) Yes, very often (score of 3)
5. I have felt scared or panicky for no very good reason	Yes, quite a lot (score of 3) Yes, sometimes (score of 2) No, not much (score of 1) No, not at all (score of 0)
6. Things have been getting on top of me	Yes, most of the time I haven't been able to cope at all (score of 3) Yes, sometimes I haven't been coping as well as usual (score of 2) No, most of the time I have coped quite well (score of 1) No, I have been coping as well as ever (score of 0)
7. I have been so unhappy that I have had difficulty sleeping	Yes, most of the time (score of 3) Yes, sometimes (score of 2) Not very often (score of 1) No, not at all (score of 0)
8. I have felt sad or miserable	Yes, most of the time (score of 3) Yes, quite often (score of 2) Not very often (score of 1) No, not at all (score of 0)
9. I have been so unhappy that I have been crying	Yes, most of the time (score of 3) Yes, quite often (score of 2) Only occasionally (score of 1) No, never (score of 0)
10. The thought of harming myself has occurred to me	Yes, quite often (score of 3) Sometimes (score of 2) Hardly ever (score of 1) Never (score of 0)

Source: Edinburgh Postnatal* Depression Scale (EPDS Cox et al 1987).
(*Developed as the Edinburgh Postnatal Depression Scale but can be used in both pregnancy and postnatal period to assess for possible depression and anxiety. Questions 3, 4 and 5 relate to possible symptoms of anxiety disorders)

3. Result

Among 150 women assessed for maternal behavioral symptoms in postpartum period based on their iron status,

women with anemia who developed postpartum blues and postpartum depression accounts to about 60% and 30% respectively, whereas 10% did not develop any post partum mood disorders. Anemia in postpartum period was significantly associated with increased risk of Postpartum

mood disorders. In contrast, no significant association was found between anemia and development of postpartum psychosis.

The demographic and social characteristics of participants stratified by PPD are shown in the following table

Table 1

Age	Post partum anemia N=53	Non anemia N=97	P value
18-25 years	21(40%)	21(22%)	0.019
26-30 years	14(26%)	34(35%)	0.25
31-35 years	18(34%)	42(43%)	0.28

20-25 yrs age group had a significant association in development of postpartum anemia

Table 2

BMI	Anemia N=53	Non-anemia N=97	P value
≤25kg/m ²	36(68%)	26(27%)	P<0.0001
26-30kg/m ²	15(28%)	30(30%)	0.7
≥31kg/m ²	2(4%)	41(43%)	<0.0001

Anemia is highly prevalent in normal BMI as well as in obese category

Table 3

Socioeconomic Status	Anemia N=53	Non-anemia N=97	P value
Low	24(45%)	28(29%)	0.04
Middle	17(32%)	37(38%)	0.46
High	12(23%)	32(33%)	0.2

In our study, anemia is more significant in low socioeconomic status.

Table 4

Type of Family	Anemia N=53	Non-Anemia N=97	P value
Joint	23(43%)	72(74%)	0.0002
Nuclear	30(57%)	25(26%)	0.0002

In our study, mothers in nuclear family have strong association for developing anemia

Table 5

Parity	Anemia (N=53)	Non-Anemia (N=97)	P value
PRIMI	19(36%)	58(60%)	0.005
MULTI	34(64%)	39(40%)	0.005

Our study showed anemia is highly significant in Multi gravida.

Table 6

	Anemia (n=53)	Non-anemia (n=97)	P value
Fatigue	32(60%)	16(17%)	0.0001
Memory loss	11(21%)	4(4%)	0.0009
Insomnia	7(13%)	2(2%)	0.006
Low self esteem	3(6%)	1(1%)	0.07
Asymptomatic	0	74(76%)	

In our study, the most common symptoms seen in anemic mothers were fatigue and memory loss, whereas symptoms like insomnia and low self esteem were moderately significant.

Table 7

	Anemia (n=53)	Non-Anemia (n=97)	P value
Blues	32(60%)	8(8%)	<0.0001
Depression	16(30)	5(5)	<0.05
Nopostpartum mood disorders	5(10%)	84(87%)	

In our study, there was high significance in development of postpartum blues and postpartum depression in anemic mothers.

4. Discussion

Postpartum depression (PPD) is a major depressive disorder that most often emerges within 6 to 12 weeks of delivery, but can happen any time up to 1 year after birth. Depression is about twice as common in women than in men and women of childbearing age are at high risk for major depressive disorder (MDD). It is linked to interference with breastfeeding and mother–infant interactions and reduced quality of childcare. In addition to risk of suicide or recurrence of mental health illness in affected women. Postpartum mood disorders can negatively impact developmental domains in offspring including emotional and cognitive functioning.

The etiology for postpartum depression suggests multifactorial cause.

Five groups of risk factors for postpartum depression are as follows:

- 1) Genetic base and previous experiences: Risk of depression during postpartum is influenced by genetic susceptibility and a family history of depression has been consistently found to be a significant risk factor for PPD.
- 2) Hormonal changes: Sexual hormone secretions are dramatically reduced subsequent to childbirth.
- 3) Nutritional status plays an important role in mental health and poor nutrition may contribute to the pathogenesis of major depressive disorder.
- 4) Psychological problems like low self esteem.
- 5) Low socioeconomic status

Recent studies reported notably higher mood disorders in postpartum women who were anemic compared with nonanemic women. This highlights the role of iron as a trace element. Iron is an essential element responsible for oxidative energy production and is distributed to different cell types in the brain. About 30% of the body iron is found in storage forms such as ferritin and hemosiderin in the spleen, liver and bone marrow and negligible amount accounts for blood transport protein transferrin. Iron deficiency has destructive effects on mental health of these women such as deficits in cognitive function, mood, short term memory, verbal learning, attention span /concentration and intelligence. It can lead to postpartum blues, depression and psychosis.

Hemoglobin decline may change the function of neurotransmitters and subsequently alter the cellular and oxidative mechanism. In addition, the reduction of inflammatory cytokines such as interleukin 2 as a causative agent for anemia, can be an influencing factor in depression.

Postpartum blues is estimated to occur in about 75% of postpartum women. They most commonly present during first 7 to 10 days following delivery. Symptoms of postpartum blues are crying, emotion lability, sleep disturbance, poor concentration, restlessness, headache and feeling of vulnerability and rejection. The reason could be due to anemia or withdrawal of progesterone following delivery. Risk factor includes previous history of depression and relationship issues. Treatment includes reassurance and follow up. It is essential to evaluate postpartum blues.

Postpartum depression occurs in 20% of women following delivery. Onset is from 1 to 3 months following delivery. Symptoms of postpartum depression include insomnia or hypersomnia, psychomotor agitation or retardation, fatigue, changes in appetite, feeling of worthlessness, decreased concentration and suicidal ideation. Patient may also have loss of interest or pleasure. Risk factors include adverse life events during or before pregnancy, domestic violence, ambivalent attitude towards pregnancy, history of depression. Edinburgh postnatal depression scale is used for assessment and treatment includes psychotherapy, antidepressant medication, and counselling.

Postpartum psychosis: It occurs in 1 in 500-800 deliveries. It begins 2-7 days after delivery. Symptoms include hallucination, delusion, cognitive impairment, insomnia. Risk factors include psychosis, bipolar disorder, marital discord, primi parity.

According to WHO's motto in 2017 "Depression; Let's talk", depression is a common emotional disorder and should be considered as a global health problem in all countries and societies. Family quality of life, early diagnosis of the disease in early weeks after delivery and early treatment are important. Therefore, the study and treatment for anemia during pregnancy and after pregnancy can be an important preventive and therapeutic measure.

5. Conclusion

In conclusion, postpartum anemia was found significantly associated with an increased risk of postpartum mood disorders. Postpartum depression was significantly higher in anemic women versus non-anemic women. Hence early diagnosis of disease in early weeks of delivery and early treatment are important. The study and treatment of anaemia during and after pregnancy can be an important preventive and therapeutic measures.

References

- [1] Kisioglu A, Ozturk M, Cakmak A, Özgüner F. Anaemia prevalence and its affecting factors in pregnant women of Isparta Province. *Biomed Res* 2005; 16: 11-14.
- [2] Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Glob Health* 2013; 1: e16-25.
- [3] Azami M, Badfar G, Shohani M, Mansouri A, Soleymani A, et al. The Prevalence of Depression in Pregnant Iranian Women: A Systematic Review and Meta-Analysis, *Iran J Psychiatry Behav Sci.* 2018 ; 12(3):e9975.
- [4] Campagne DM. The obstetrician and depression during pregnancy. *Eur J Obstet Gynecol Reprod Biol* 2004; 116: 125-30.
- [5] Goshtasebi A, Alizadeh M, Gandevani SB. Association between maternal anaemia and postpartum depression in an urban sample of pregnant women in Iran. *J Health Popul Nutr* 2013; 31: 398-402.
- [6] Corwin EJ, Murray-Kolb LE, Beard JL. Low hemoglobin level is a risk factor for postpartum depression. *J Nutr* 2003; 133: 4139-42.
- [7] Armony-Sivan R, Shao J, Li M, et al. No relationship between maternal iron status and postpartum depression in two samples in China. *J Pregnancy* 2012; 2012: 521431.
- [8] Alharbi AA, Abdulghani HM. Risk factors associated with postpartum depression in the Saudi population. *Neuropsychiatr Dis Treat* 2014; 10: 311-6.
- [9] Myint AM, Leonard BE, Steinbusch HW, Kim YK. Th1, Th2, and Th3 cytokine alterations in major depression. *J Affect Disord* 2005; 88: 167-73
- [10] Doucet S, Dennis C-L, Letourneau N, Blackmore ER. Differentiation and clinical implications of postpartum depression and postpartum psychosis. *J Obstet Gynecol Neonatal Nurs.* 2009;38:269-79.
- [11] Leung BMY, Kaplan BJ. Perinatal depression: prevalence, risks, and the nutrition link—a review of the literature. *J Am Diet Assoc.* 2009;109:1566
- [12] Marcus SM. Depression during pregnancy: rates, risks and consequences. *Can J Clin Pharmacol.* 2009;16:e2
- [13] Gjerdingen DK, Yawn BP. Postpartum depression screening: importance, methods, barriers, and recommendations for practice. *J Am Board Fam Med.* 2007;20:280-8