

Association of Anemia with Postpartum Haemorrhage

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ABSTRACT

Introduction: Maternal anaemia is a common condition. According to the World Health Organization, pregnancy anaemia and postpartum anaemia is very frequent across the world, and confers a number of health risks to mother and child. Maternal symptoms and signs include fatigue, paleness and cardiovascular strain, reduced mental and physical performance and increased risk for blood transfusion.

Objectives: To determine the association of maternal anaemia with postpartum haemorrhage in pregnant females presenting for antenatal check-up

Study Design: Case control study

Setting: Department of Obstetrics and Gynaecology B Unit, Mardan Medical Complex.

Duration of Study: Study was carried out over a period of six months from 01-08-2019 to 31-01-2020

Subjects and Methods: A total of 224 patients (112 in each group) were included in the study. Cases were females with PPH and controls were females without PPH.

Results: Mean age of the patients was 28.0±4.3 and 28.2±5.1 in group-A and B, respectively. Mean gestational age was (38.7±1.8 vs 38.5±2.4), mean BMI was (27.0±4.2 vs 26.2±4.6) and mean Hb was (9.1±2.1 vs 9.9±1.9). Majority of the patients were between para 1-2 in both cases. Anaemia was found in 59 patients (52.7%) of cases and 36 patients (32.2%) of controls (Odds ratio 2.35; 95% CI 1.36 - 4.04). Stratification for age, gestational age, BMI and parity was also carried out.

Conclusion: In conclusion, postpartum anaemia has a high prevalence. Anemia during the third trimester of pregnancy, heavy bleeding perceived by the mother during delivery, younger maternal age was associated with postpartum anemia.

Keywords: Anaemia, Blood loss, Postpartum haemorrhage

INTRODUCTION

Anaemia in pregnancy is an important health issue resulting in high maternal morbidity and mortality [1]. Maternal anaemia is associated with postpartum haemorrhage [2].

Maternal iron deficiency anaemia defined using the WHO criteria for moderate anaemia (pregnant women with an Hb level of 7-9.9 g/dL) and severe anaemia (Hb level <7 g/dL) [1]. Maternal anaemia is associated with increased risks of PPH [2]. Postpartum haemorrhage (PPH) was classified into two types, primary and secondary. Primary is defined as blood loss of greater than 500 ml due to vaginal delivery and loss of 1500 ml due to C section within first 24 hours of delivery. Its incidence is 5% of all deliveries. Secondary is defined as excessive vaginal blood loss or heavy lochial discharge occurring at least 24 hours after the end of the third stage of labor [3].

PPH remains a significant cause of maternal mortality and morbidity like hypovolemic shock, anaemia, multi organ failure, consumptive coagulopathy, disseminated intra vascular coagulation (DIC), blood transfusion related complications and hysterectomy leading to loss of childbearing potential [4]. It is the leading cause of maternal death in low-income countries and is the primary cause of approximately one-quarter of global maternal deaths [5]. Consequently, PPH has received increasing attention as a quality indicator for obstetric care. Although maternal mortality rates have declined greatly in the developed world, PPH remains a leading cause of maternal mortality elsewhere.

All women who carry a pregnancy beyond 20 weeks' gestation are at risk for PPH and its sequelae. Anaemia is common in developing world due to poverty and less birth spacing.

There is increased risk of PPH observed among pregnant women with moderate-severe anaemia who underwent induction of labour, but it is also possible that other mechanisms exist [2]. Common causes for PPH include uterine atony, retained or adherent placenta, and lacerations [4]. In the developing world, several countries have maternal mortality rates in excess of 1000 women per 100,000 live births, and World Health Organization statistics suggest that 60% of maternal deaths in developing

countries are due to PPH, accounting for more than 100,000 maternal deaths per year. Overall, PPH accounts for an estimated 25% of maternal mortality worldwide [6]. One study showed that among pregnant females, anaemia was found in 53.8% in females with PPH and 35.1% in females without PPH (p<0.05) [4].

Rationale of this study is to determine the association of maternal anaemia with postpartum haemorrhage in pregnant females presenting for antenatal check-up. Literature showed that there is a significant association of PPH and anaemia during pregnancy. But not much work has been done in this regard. Moreover, no local study found which could help us to determine the extent of problem in local population. So we want to conduct this study to get local evidence which could help us whether PPH is significantly associated with anaemia. So that we can plan to rectify the problem of anaemia during pregnancy in order to prevent PPH. This would help us to improve our practice and knowledge and we will be able to improve condition of patient.

MATERIALS AND METHODS

This case control study was conducted at OPD of Department of Obstetrics and Gynaecology, B UNIT, Mardan Medical Complex. Study was carried out over a period of six months from 01-08-2019 to 31-01-2020. Total 224 pregnant women of age 20-40 years, parity < 5, presenting after 20 weeks of pregnancy were enrolled in this study. Multiple pregnancy (on ultrasound), morbidly obese (BMI>35kg/m²), history of retained placenta in previous pregnancy, placenta previa, placenta accreta, percreta, increta (on ultrasound), hemophilia, thalassemia (on medical record), coagulation abnormalities (PT>15sec, INR>2), high risk females i.e. chronic or gestational hypertension (BP >140/90mmHg), diabetes (BSR>186mg/dl), hypothyroidism (TSH>5IU/L), renal problems (creatinine>1.2mg/dl), deranged LFTs (AST>40 IU, ALT > 40IU) were excluded.

Informed consent was obtained. Demographic information (name, age, gestational age, parity and BMI) were also obtained. Then patients were divided in two groups i.e. of females with PPH (cases) and group of females without PPH (controls). Then

medical record of females was obtained and level of Hb at time of presentation for delivery was noted. If level of Hb <10g/dl, then anaemia was noted (as per operational definition). Females with PPH and anaemia were managed as per hospital protocol.

Data were analyzed by SPSS version 20. Quantitative variables like age, gestational age, BMI and Hb were calculated as mean and standard deviation. A qualitative variable like anaemia was calculated as frequency and percentage. Parity was also presented as frequency. Odds ratio was calculated to measure association of with anaemia. OR>1 was considered as significant. Data were stratified for age, gestational age, BMI and parity. Post-stratification, adjusted OR was calculated to measure association of PPH with anaemia. OR> 1 was considered as significant.

RESULTS

Mean age of the patients was 28.0±4.3 and 28.2±5.1 in group-A and B, respectively. Mean gestational age was (38.7±1.8 vs 38.5±2.4), mean BMI was (27.0±4.2 vs 26.2±4.6) and mean Hb was (9.1±2.1 vs 9.9±1.9). Majority of the patients were between para 1-2 in both cases. (Table 1)

Table 1: Baseline details of all the patients

Variables	Group A (Cases)	Group B (Control)
Mean Age (Years)	28.0±4.3	28.2±5.1
Gestational age (Weeks)	38.7±1.8	38.5±2.4
BMI (kg/m ²)	27.0±4.2	26.2±4.6
Hb (mg/dl)	9.1±2.1	9.9±1.9
Parity		
1 to 2	60 (53.6)	58 (51.8)
3 to 4	52 (46.4)	54 (48.2)

Anaemia was found in 59 patients (52.7%) of cases and 36 patients (32.2%) of controls (Odds ratio 2.35; 95% CI 1.36 - 4.04). Stratification for age, gestational age, BMI and parity was also carried out.

Table 2: Distribution of patients by anaemia

Anaemia	Group-A (Cases)		Group-B (Controls)	
	No.	%	No.	%
Yes	59	52.7	36	32.2
No	53	47.3	76	67.8
Total	112	100.0	112	100.0
Odds ratio =		2.350	95% CI (1.36 - 4.04)	

Table 3: Stratification of age with regard to anaemia

Age (Year)	Group	Anaemia		Total	Odds ratio/ (95% CI)
		Yes	No		
20-30	Group-A	42	36	78	2.545 (1.29-4.98)
	Group-B	22	48	70	
Total		64	84	148	
31-40	Group-A	17	17	34	2.00 (0.79-5.06)
	Group-B	14	28	42	
Total		31	45	76	

Table 4: Stratification of gestational age with regard to anaemia

Gestational age (Week)	Group	Anaemia		Total	Odds ratio/ (95% CI)
		Yes	No		
≤ 37	Group-A	0	3	3	1.62 (1.05-2.49)
	Group-B	5	8	13	
Total		5	11	16	
> 37	Group-A	59	50	109	2.58 (1.46-4.56)
	Group-B	31	68	99	
Total		90	118	208	

Table 5: Stratification of BMI with regard to anaemia

BMI (kg/m ²)	Group	Anaemia		Total	Odds ratio/ (95% CI)
		Yes	No		
< 25	Group-A	17	16	33	1.93 (0.78-4.78)
	Group-B	17	31	48	
Total		34	47	81	
≥ 25	Group-A	42	37	79	2.68 (1.34-5.38)
	Group-B	19	45	64	
Total		61	82	143	

Table 6: Stratification of parity with regard to anaemia

Parity	Group	Anaemia		Total	Odds ratio/ (95% CI)
		Yes	No		
1-2	Group-A	32	28	60	2.34 (1.11-4.95)
	Group-B	19	39	58	
Total		51	67	118	
3-4	Group-A	27	25	52	2.35 (1.06-5.18)
	Group-B	17	37	54	
Total		44	62	106	

DISCUSSION

Anemia is one of the leading causes of disability and is a major global public health problem.¹ Even though the problem of iron deficiency in pregnancy is adequately emphasized, very little attention has been paid to postpartum anemia.

Maternal anemia affects postpartum emotion and cognition [123] and a low hemoglobin level has been found to be associated with postpartum depression [124]. Anemia during the postpartum period can be a contributing factor for low milk supply, delayed wound healing, low immunity, and increased susceptibility to mastitis, ductitis, and urinary tract infection [125,126].

Therefore, postpartum anemia occurring when the mother is learning to parent and take care of her baby will have major consequences and warrants greater attention and higher quality care.

The change in hemoglobin values during the postpartum period in a setting of optimal antenatal care would be of great use because it can provide a baseline against which comparisons can be made for the rest of the country. This study highlights postpartum anemia as a significant public health problem. Currently, there are no separate cut-off values defined by the World Health Organization for the postpartum period.

In the current study, the prevalence of anemia in females with PPH (cases) was 52.7% while in females without PPH (controls) anaemia was observed in 36 females (32.2%) with odds ratio 2.350 (95% CI 1.36 - 4.04). Our findings are comparable with a study carried out by Naz et al [4], they reported anaemia 53.8% in cases and 35.1% in controls. Reports from other developing countries also support our results [118,119,127,128,129].

During the postpartum period, the hemodilution effect usually wanes and hemoglobin returns to normal. This period is characterized by increased erythropoiesis and expansion of the red cell mass. A fall or inadequate rise in hemoglobin during the postpartum period might be due to excessive blood loss during and after delivery and/or due to inadequate erythropoiesis taking place postpartum, which could be due to depleted iron stores. These poor iron stores often date back to the prepregnancy state and continue throughout the pregnancy, and tip the precarious balance in the postpartum period.

Heavy/moderate blood loss as perceived by the mother at the time of delivery was a significant risk factor for postpartum anemia. Previous studies from Uganda and Germany have also identified that heavy blood loss perceived by the mother at delivery was significantly associated with anemia during the postpartum period [117,130].

Not taking iron and folic acid regularly in the postpartum period has been identified as a risk factor for postpartum anemia. A woman might reach postpartum period after depleting all her iron stores, and supplementation with iron tablets at that time is necessary for the production of red blood cells. In areas where there is a high prevalence of anemia, the World Health Organization recommends continuing supplementation of iron tablets for 3 months into the postpartum period [131].

CONCLUSION

In conclusion, postpartum anaemia has a high prevalence. Anemia during the third trimester of pregnancy, heavy bleeding perceived

by the mother during delivery, younger maternal age was associated with postpartum anemia.

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