

Factors Associated with Postpartum Iron Deficiency Anemia

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ABSTRACT

Objectives: To study the factors associated with postpartum iron deficiency anemia.

Study Design: Case-control study.

Place and Duration of Study: Department of Obstetrics & Gynecology Unit-II, Ghulam Muhammad Mahar Medical College Sukkur, Pakistan from 1st January 2020 to 31st December 2020

Methodology: Five hundred and seventy six women were included in which 144 women with postpartum iron deficiency anemia (Hb <11 g/dl at 24 to 48 hours post-delivery) were as case group and 432 women without postpartum iron deficiency anemia (Hb >11gdl at 24-48 hours post delivery) were as control group.

Results: There was not significant ($p=0.87$) difference between case and control groups. Multiparity was associated with postpartum iron deficiency anemia ($p=0.012$). Postpartum iron deficiency anemia was about two times more likely in multiparous (OR=1.65; 95%CI: 1.12 to 2.44) than primiparous, failure to exclusively breast-feeding was also associated ($p=0.003$), postpartum iron deficiency anemia was two times more likely in those women those were not exclusive breast-feeding (OR=1.95; 95%CI: 1.24 to 3.07) than those were. Similarly post-partum iron deficiency anemia was ten times more likely in those women whose education was below or metric (OR=10.54; 95%CI: 2.85 to 39.03) than those who are highly educated. On the other hand, obesity was not associated ($p=0.075$) unadjusted odd ratio of obese was 0.68 (95%CI: 0.44 to 1.04)

Conclusion: Multiparity failure to exclusively breast feed is significantly associated with postpartum iron deficiency anemia.

Keywords: Postpartum iron deficiency anemia, obesity, multiparty

INTRODUCTION

Anaemia is a condition that affects 25% to 50 % of the population of the world and approximately 50% of pregnant women.^{1,2} It affects forty percent of postpartum women. Postpartum anemia is chiefly due to iron deficiency³ and is caused principally by insufficient iron intake and blood loss during pregnancy. Iron deficient state is contributed by increased iron requirements of pregnancy,⁴ and blood loss during delivery.⁵⁻⁶ Various undesirable health outcomes occur because of postpartum iron deficiency anemia, like breathlessness, tiredness, palpitation, lactation failure, postpartum depression and maternal infection; thus leading to increased use of health resources, including prolonged hospital hang about.⁷

Postpartum period is generally thought to be the time of least possible iron deficiency, because iron status is expected to improve considerably after delivery.⁸ Nevertheless, recent studies have reported a high prevalence of postpartum iron deficiency anaemia among ethnically diverse low income population in US⁹⁻¹² remarking that poor postpartum iron status is a public health hitch that warrants greater attention. Antenatal factors worsen the postpartum iron state for multiparity (OR=1.5, 95% CI:0.8,2.9), prepregnancy obesity (OR=3.0, 95% CI:1.6,5.5). Certain postpartum factors also contribute to iron deficiency anemia for instance, failure to exclusively breast feed (OR=2.8, 95% CI: 1.0,7.7).¹¹ Potential factors which require further evaluation are inadequate postpartum iron intake through diet and /or supplements, long duration of lochia.⁸ The prevalence of factors associated with postpartum iron deficiency anaemia and its unpleasant health outcomes in Pakistan have not been evaluated yet. The maternal anaemia and its impact on perinatal outcome variables with a statistically significant association as preterm delivery (95% CI:2.5-6.3), low birth weight (95% CI:1.3-3.7) and fetal growth restriction (95% CI:1.1-3.3).¹³ Another study compares prevalence of anaemia in grandmultipara with women of lesser parities, results showed that severe anemia more prevalent in grandmultipara (4%) as compared to women of lessee parities(2%).¹⁴ Thus the purpose was to study the factors associated with postpartum iron deficiency anemia in order to increase awareness and introducing preventive strategies.

MATERIALS AND METHODS

This case-control study was conducted in the Department of Obstetrics and Gynaecology at Ghulam Muhammad Mahar Medical College, Sukkur Pakistan from 1st January 2020 to 31st December 2020. A total of 576 women were included in which 144

women with postpartum iron deficiency anemia (Hb <11 g/dl at 24 to 48 hours post-delivery) were as case group and 432 women without postpartum iron deficiency anemia (Hb >11gdl at 24-48 hours post delivery) were as control group. Women with postpartum iron deficiency anemia were included. The women who refused to give consent, pre-delivery anemia, anemia other than iron deficiency anemia, obstetrical complications or medical illness, peripartum blood transfusion, postpartum haemorrhage were excluded. The data was entered and analyzed through SPSS-20. Multiple logistic regression was done to identify the factors associated with postpartum iron deficiency anemia, odds ratio and their 95% confidence intervals along with p-values. Significance was taken as p-value <0.05. Adjusted odds ratio was calculated to evaluate Interaction between factors.

RESULTS

The average age of the postpartum women was 28.51±4.94 years (Table 1). There was not significant ($p=0.87$) between case and control groups (Fig. 1). Multiparity was associated with post partum iron deficiency anemia ($p=0.012$). Post partum iron deficiency anemia was about two times more likely in multiparous (OR=1.65; 95%CI: 1.12 to 2.44) than primiparous (Table 2). The pre-pregnancy obesity was not associated with post partum iron deficiency anemia ($p=0.075$).

Table 1: Frequency of maternal age (n=576)

Maternal age (years)	No.	%
16.3-18.8	4	0.7
21.9-21.3	31	5.4
21.4-23.8	60	10.4
23.9-26.3	124	21.5
26.4-28.8	89	15.4
28.9-31.3	116	20.1
31.4-33.8	61	10.6
33.9-36.3	48	8.4
36.4-38.8	24	4.2
38.9-41.3	16	2.8
41.4-43.8	2	0.4
43.9-48.3	1	0.1

Unadjusted odd ratio of obese was 0.68 (95% CI: 0.44 to 1.04) [Table 3]. Failure to exclusively breastfeed was associated with post partum iron deficiency anemia ($p=0.003$). Post partum iron deficiency anemia was two times more likely in those women those were not exclusively breastfeeding (OR=1.95; 95% CI: 1.24 to 3.07) than those who were exclusively breastfeeding (Table 4).

Similarly post partum iron deficiency anemia was ten times more likely in those women whose education was below or metric (OR=10.54; 95% CI: 2.85 to 39.03) than those who are highly educated (Table 5).

Parity, exclusive breastfeeding and education were the important predictors of iron deficiency anemia. Adjusted odd ratio

by the logistic model were as follows, multiparity 1.69 (95% CI: 1.08 to 2.64), pre-pregnancy obesity 2.05 (95% CI: 0.44 to 1.14); not exclusively breastfeeding 2.37 (95% CI: 1.05 to 2.51), low education 11 (95% CI: 2.50 to 35.36) [Table 6].

Table 2: Comparison of parity between case and control groups

Parity	Case	Control	Total	Odd Ratio	95% CI for odd ratio
Multiparous	94(65.3%)	230(53.2%)	324(56.3%)	1.65	1.12 to 2.44
Primiparous	50(34.7%)	202(46.8%)	252(43.8%)		

Chi-square = 6.359 df= 1 p=0.012

Table 3: Comparison of obesity between case and control groups

Obesity	Case	Control	Total	Odd Ratio	95% CI for odd ratio
Obese	35(24.3%)	139(32.2%)	174(30.2%)	0.68	0.44 to 1.04
Non obese	109(75.7%)	293(67.8%)	402(69.8%)		

Chi-square = 3.17 df= 1 p=0.075

Table 4: Comparison of exclusively breastfeeding between case and control groups

Exclusively breastfeeding	Case	Control	Total	Odd Ratio	95% CI for odd ratio
No	38(26.4%)	67(15.5%)	105(18.2%)	1.95	1.24 to 3.07
Yes	106(73.6%)	365(84.5%)	471(81.8%)		

Chi-square = 8.58 df= 1 p=0.003

Table 5: Comparison of education between case and control groups

Education	Case	Control	Total	Odd Ratio	95% CI for odd ratio
Metric & below metric	22(15.3%)	3(0.7%)	25(4.3%)	10.54	2.85 to 39.03
Intermediate	34(23.6%)	169(39.1%)	203(35.2%)	0.29	0.15 to 0.54
Graduate	63(43.8%)	224(51.9%)	287(49.8%)	0.41	0.23 to .73
Postgraduate	25(17.4%)	36(8.3%)	61(10.6%)	1.00	-

Chi-square = 70.025 df= 3 p=0.0005

Table 6: Adjusted odds ratios showing the association of factors with postpartum iron deficiency anemia

Factors	Wald Statistics	Adjusted OR	95% CI
Age (Years)	2.74	0.96	0.91 to 1.01
Parity:			
Primiparous		1.00	-
Multiparous	5.45	1.69	1.08 to 2.64
Obesity			
Non Obese (BMI≤29)		1.00	-
Obese (BMI>29)	2.05	0.71	0.44 to 1.14
Exclusive Breastfeeding			
Yes		1.00	-
No	2.37	1.48	1.05 to 2.51
Education			
Postgraduate		1.00	-
Graduate	9.01	0.39	0.21 to 0.72
Intermediate	13.41	0.27	0.13 to 0.54
Metric & < metric	11.00	9.41	2.50 - 35.36

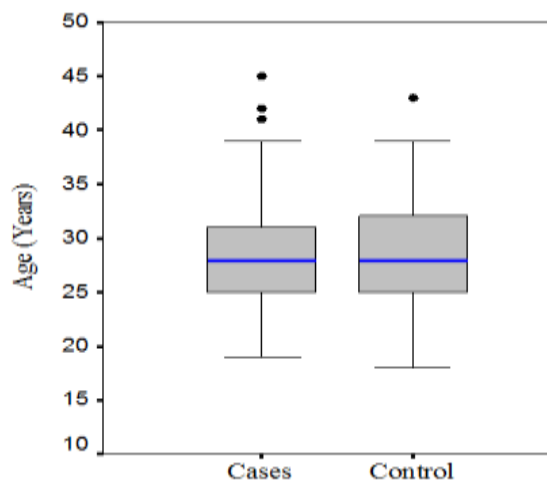


Fig. 1: Comparison of cases and control groups

DISCUSSION

Postpartum iron deficiency anemia remains an extensive public health hitch with major consequences for human health as well as social and economic development.^{15,16} Although estimates of the prevalence of anemia vary widely and accurate data are often lacking. It affects forty percent of postpartum women. Thirty percent having mild anemia that is Hb less than 10 g/dL and 10% of women have severe anemia that is, Hb less than 8 g/dL. Postpartum anemia is mainly due to iron deficiency.³ Iron deficient state was contributed by increased iron requirements of pregnancy⁴ and blood loss during delivery.⁵⁻⁶

In the postpartum anemia predictors, the three factors were associated with increased odds of anemia.¹⁰ Antenatal factors worsen the postpartum iron state (multiparity, prepregnancy obesity). Certain postpartum factors also contribute to iron deficiency anemia for instance, failure to exclusively breast feed.¹¹ Multiparous women may have a higher anemia risk because of the high iron demand of pregnancy coupled with insufficient recovery of iron status between pregnancies.¹¹

The association between pre-pregnancy obesity and anemia may related to factors common to obese women: greater blood loss during delivery¹⁷ less frequent use of vitamin and mineral supplements¹⁸ and a poor quality diet.^{19,20}

The results of this study show that multiparity associated with post-partum iron deficiency anemia was $p=0.012$. Post-partum iron deficiency anemia was about two times more likely in multiparous (OR=1.65; 95%CI: 1.12 to 2.44) than primiparous but it did not reach statistical significance ($p=0.07$) but prepregnancy obesity was not associated with post partum iron deficiency anemia ($p=0.075$). The post-partum iron deficiency anemia was two times more likely in those women those were not exclusively breastfeeding (OR=1.95; 95% CI: 1.24 to 3.07) than those who were exclusively breastfeeding. Similarly post-partum iron deficiency anemia was ten times more likely in those women whose education was below or metric (OR=10.54; 95% CI: 2.85 to 39.03) than those who are highly educated.

CONCLUSION

The multiparity, failure to exclusively breast feed and is significantly associated with postpartum iron deficiency anemia while pre-pregnancy obesity does not prove strong association.

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