

Determinants of post-partum anaemia – a cross sectional study

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Abstract

Introduction: Anaemia in the postpartum period is a common public health problem, but there is a paucity of studies regarding anaemia in the postnatal period. Prevention and treatment of anaemia in post-natal women is essential in reducing maternal mortality and morbidity, improving quality of life, as well as improving work performance.

Objectives: To determine the correlates of anaemia at the post-partum period in Mariakani sub-county hospital.

Methods: Cross sectional study, a total of three hundred and twenty three women attending mother and child health clinic at the sixth week post-partum at Mariakani sub-county hospital were recruited into the study. Their management for anaemia during antenatal period was assessed using prenatal records followed by a haemoglobin estimation using the prick method; those found to be anaemic by World Health Organisation (WHO) criteria had further investigations done to determine the cause.

Results: The duration of haematinic use and repeated Intermittent Preventive Therapy (IPT) administration during pregnancy were protective for post-natal anaemia. Maternal education, place of delivery, complications during pregnancy or delivery and late ANC booking were significantly associated with post-natal anaemia.

Conclusion and recommendation: Management of anaemia at the antenatal period is the most crucial strategy in combating post-natal anaemia, and this is highly recommended in all levels of health care system. In addition promoting facility delivery and empowering women through formal education should form part of the management in the preventive strategies to combat anaemia.

Introduction

Anaemia is the world's second leading cause of morbidity and thus one of the most serious global public health problems (1,2). Although anaemia in postnatal period is widespread, health care systems have not addressed it effectively and there are few local studies on anaemia in the postpartum period. Women of reproductive age, adolescent girls and pregnant women are risk-prone to anaemia (3,4). Based on the World Health Organisation (WHO) reviews on national representative samples from 1993 to 2005, 42% of pregnant women have anaemia and 60% of this is due to iron deficiency in non-malaria areas and 50% in malaria endemic regions (5). Women with post-partum anaemia tend to suffer more from "maternal blues", reduced sense of well-being and increased risk of postpartum depression compared to non-anaemic mothers (6,7). Prevention and treatment of anaemia in post natal women is therefore essential in reducing maternal mortality and morbidity, improving quality of life, as well as improving work performance (6). Mothers are at greater risk of post-partum anaemia if they were anaemic during the third trimester of pregnancy, suffered post partum haemorrhage or had multiple gestations delivery with prenatal anaemia is the strongest predictor of post-partum anaemia (7,8).

In line with this, the WHO recommends a preventive regimen of sixty milligram of iron and four hundred micrograms folic acid daily during pregnancy for all women, beginning as soon as possible during gestation and not later than the third month (9) and where the prevalence of anaemia in pregnancy is more than 40%, supplementation with iron and folate should continue for three months in the postpartum period (10).

Bearing in mind the paucity of local data on the subject, we conducted this study in a sub-urban health facility in Kenya to determine the correlates of anaemia in the postpartum period.

Materials and Methods

We conducted a cross sectional study at the Mariakani sub-county hospital. The study included all women presenting six weeks post-partum. Entry point was the mother and child health clinic at the hospital. Women were eligible if they were 6-weeks post delivery. A total of 323 women were required considering a 75.6% prevalence of anaemia in the region to achieve 95% precision. Simple random sampling method was used to select women for the study.

Data management

An interviewer administered structured questionnaire was used to collect socio demographic details. The

antenatal card was used to record patients' use of haematinics, deworming medication and Intermittent Preventive Therapy (IPT) for malaria. An inquiry was done on utilization of Insecticide Treated Nets (ITN) at home.

Laboratory tests

After the initial interview the women were sent to the laboratory for haemoglobin estimation. A prick haemoglobin (Hb) was done using the mission HB-meter. Further tests were only done for those whose Hb was below 10.5g/dl. These included stool test using the dilution technique, complete blood count and a blood slide for malaria parasites.

The results were then returned to the principal investigator or research assistant who guided treatment based on the results after explaining to the patient the findings of the tests done. Women whose Hb was above 10.5g/dl were informed about the results and counseling was done on prevention of anaemia. Women with a Hb below 10.5g/dl, were treated with haematinics and a return visit of two days was arranged to get the results of the additional tests done, where treatment offered was based on results. Treatment followed the standard of care at the hospital.

The entire samples were discarded in accordance to the safety of human waste discarding regulations.

Data analysis

Data analysis was conducted to determine strength of association between dependent and independent variables using Chi-square for categorical variables. Categorical variables are summarized using proportions. All statistical tests were performed at 5% significance level. A logistic regression model was fitted to the anaemia data to explain the predicted odds of postpartum anaemia. The model included postpartum anaemia as the dependant variable and four main effects; namely complications during antenatal period, place of delivery, gestational age and maternal occupation, all measured as categorical variables. Inclusion of predictors in the variable was based on statistically significant association (p values <0.05) in the bivariate analysis.

Results

The point prevalence of post-partum anaemia was 53 (16.4%).

Table 1: Prevalence of post-partum anaemia by socio-demographic characteristics

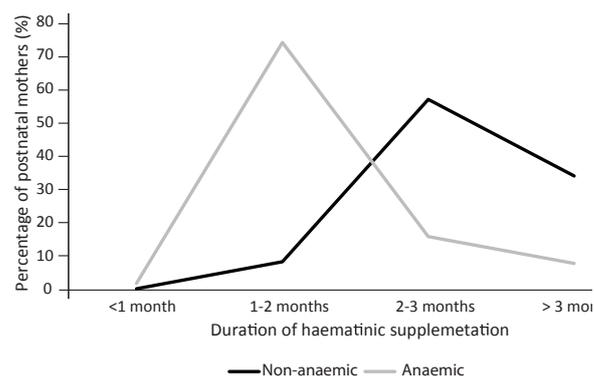
Socio-demographic characteristics	Not anaemic		Anaemic		P value
	No.	(%)	No.	(%)	
Marital status					
Single	50	79.4	13	20.6	0.059
Married	212	85.8	35	14.2	
Divorced/Separated	6	60	4	40	
Widowed	2	66.7	1	33.3	
Age group					
14-19	33	82.5	7	17.5	0.346
20-25	102	82.3	22	17.7	
26-30	72	85.7	12	14.3	
31-35	53	88.3	7	11.7	
>35	10	66.7	5	33.3	
Education level					
None	27	65.9	14	34.1	0.004
Primary	188	85.5	32	14.5	
Secondary	35	83.3	7	16.7	
University/College	20	100	0	0	
Occupation					
Housewife	239	85.4	41	14.6	0.008
Employed	11	73.3	4	26.7	
Business	20	71.4	8	28.6	
Religion					
Christian	152	84.9	27	15.1	<0.001
Islam	112	83.6	22	16.4	
Others	6	60	4	40	

Maternal education, occupation and religion showed statistically significant association with postnatal anaemia (P<0.05). Regarding formal education tertiary education perfectly predicted protection from post natal anaemia with all (n=20) mothers with university/college education being non- anaemic.

Table 2: Obstetric history and postpartum anaemia

Obstetric history	Not anaemic		Anaemic		P value
	No.	(%)	No.	(%)	
Parity					
1	44	84.6	8	15.4	0.073
2	99	82.5	21	17.5	
3	97	88.2	13	11.8	
4	11	68.8	5	31.3	
>5	17	68	8	32	
Interval between last 2 pregnancies					
Less than 1 year	12	70.6	5	29.4	0.382
1 year	99	82.5	21	17.5	
2 years	63	84	12	16	
>3 years	52	88.1	7	11.9	
Mode of delivery in last pregnancy					
SVD	249	84.4	46	15.6	
C/S	21	75	7	25	0.20
Place of delivery					
Health facility	268	84.3	50	15.7	
Home	2	40	3	60	0.01
Complications during/after delivery					
Yes	6	54.5	5	45.5	
No	264	84.6	48	15.4	0.008
Attendance PNC after delivery					
Yes	21	75	7	25	
No	249	84.4	46	15.6	0.20

Among the obstetric risk factors evaluated, the place of delivery and complications during or after delivery were significantly associated with anaemia. Those with complications or home deliveries were strongly associated with post natal anaemia ($P < 0.05$).

Figure 1: Duration of haematinic use between anaemic and non- anaemic patients

There was a statistically significant association between duration of haematinic use and anaemia prevalence. As shown in Figure 1, most (74%) anaemic patients had used haematinics for 1-2 months while 57% of the non-anaemic patients had used haematinic for a longer duration of between 2 and 3 months.

Table 3: Multivariable regression analysis in relation to post-partum anaemia

Complication during or after delivery	Odds Ratio	95% CI	P value
Complications present			
Complications present	1.0 (Reference)		
No complications	0.2	0.04 - 0.8	0.02
Place of delivery			
Hospital facility delivery			
Hospital facility delivery	1.0 (Reference)		
Non-facility delivery			
Non-facility delivery	12.1	1.5 - 99.9	0.021
ANC initiation			
First or second trimester			
First or second trimester	1.0 (Reference)		
Third trimester			
Third trimester	10.5	5.3 - 20.9	<0.001
Occupation			
Housewife			
Housewife	1.0 (Reference)		
Employed			
Employed	1.6	0.3 - 7.4	0.562
Business			
Business	2.8	1.0 - 7.8	0.047

Multivariable regression analysis of the independent predictors of post-partum anaemia as presented in Table 3. The findings of the logistic regression model including complications during pregnancy and delivery, place of delivery, pregnancy gestation during initial ANC visits and maternal occupation showed that: non-facility delivery, late initiation of ANC and complications during pregnancy or delivery were independently associated with higher risk of post-partum anaemia.

The risk of anaemia in mothers with no labour or delivery complications was 0.2 times lower than that of mothers with complications (OR =0.2; 95% CI 0.04-0.8). The risk of anaemia increased ten times (OR=10.5;95% CI 5.3-20.9) in mothers initiating ANC care during third trimester compared to first or second trimester. Similarly the risk of anaemia was twelve fold higher in non-facility deliveries (OR=12.1;95% CI 1.5-99.9) compared to facility delivery.

Occupation was not significantly associated with anaemia in the logistic regression suggesting possible confounding effects by occupation in the bivariate analysis. Clients formal education showed significant association in the bivariate analysis with post-partum anaemia but has been excluded in the regression analysis because tertiary education perfectly predicted post natal anaemia with all twenty mothers with tertiary education being non anaemic.

Discussion

The prevalence of anaemia at the six week postpartum was 16.4% in our study population. Factors associated with post-partum anaemia included; late antenatal clinic initiation, non-facility delivery and delivery complications. Maternal formal education, long duration of haematinic use at the antenatal period and repeated IPT use were found to be protective for post-partum anaemia.

Even though the prevalence of post-partum anaemia in our study population was high; it was much lower in comparison to other studies in the region. A study done in Uganda showed a prevalence of 64.4% (11) while another one done in a North Indian village showed a prevalence of 70% (12). Literature search did not reveal any previous study done at the same setting and therefore we do not have previous results to compare. The low prevalence recorded in our study in comparison to the other studies, may be because majority of the study participants were beneficiaries of the obstetric aid funding and were captured in the antenatal period where management for anaemia was crucial and directly impacts on post natal anaemia. The study done in the North Indian village was a community based study and showed a high prevalence which may not be comparable to a hospital based study. Another explanation may be due to the variation in haemoglobin

cut off used to define anaemia at the post-partum period in the different studies.

Health facility delivery was protective for post-partum anaemia in this study, which could be due to effective management and utilization of preventive strategies in labour management as the patient is attended to by a health professional. A study done in Uganda identified complications during delivery, which were significantly associated with postnatal anaemia as retained placenta and post-partum haemorrhage. This study was consistent with the findings in the Uganda study as it showed retained placenta was the commonest complication occurring in four out of the five participants who had home deliveries (11).

From this study formal maternal education was protective for postnatal anaemia; this could be due to better health seeking behaviour in the group with education. This was consistent with a study done at Vietnam where women who had lower education were more anaemic than women who had higher education (7).

A majority of the women had taken haematinics in the antenatal period. This upward trend in haematinic supplementation during pregnancy was also reported in the Kenya Demographic Health Survey (KDHS) 2008-2009 with a rise from 41% in 2003 to 60% 2008-2009 (14). Our higher value could be due to the benefits in OBA funding in the facility which majority of the study participants were beneficiaries and thus had ready access to haematinics and IPT. Long duration of haematinic use was protective of anaemia, as was the case of repeated IPT administration. Iron supplementation improves the iron status of the mother during pregnancy and the postnatal period, even in women who enter pregnancy with low iron stores. The government of Kenya policy on IPT administration emphasizes its prophylactic use in malaria endemic regions (13).

It is interesting to note that a majority of the study participants had not attended a post natal clinic. As per KDHS 2008-2009, 53% of women do not receive post natal care (14). Our study recorded a much higher prevalence. This study clearly shows post natal follow up is a neglected opportunity. However there was no statistical significance in post natal anaemia and post natal visits in this study.

Late ANC initiation was a risk factor for post natal anaemia compared to early ANC visit, This could be due to longer duration of haematinics use and other interventions in the management of anaemia antenatally which the population who attended clinic early could have benefited from.

Conclusions

Management of anaemia at the antenatal period is the most crucial strategy in combating post natal anaemia, and this is highly recommended in all levels of health

care system. In addition promoting facility delivery and empowering women through formal education should form part of the management in the preventive strategies to combat anaemia.

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