

Full Length Research Paper

Maternal anaemia impact on maternal and perinatal outcome an observational study at University Hospital of Sindh

Naushaba Rizwan^{1*}, Syed Farhan Uddin² and Firdous Mumtaz¹

¹Department of Obstetrics and Gynaecology, Liaquat University of Medical and Health Sciences, LUMHS) Jamshoro, Sindh – Pakistan.

²Department of Physiology, Liaquat University of Medical and Health Sciences, LUMHS) Jamshoro, Sindh – Pakistan.

Received 19 September, 2012; Accepted 01 January, 2013

Anemia in pregnancy constitutes a major public health problem in developing countries and is associated with adverse maternal and perinatal outcome. The objective of the study is to determine the prevalence of anemia in pregnancy and its impact on maternal and perinatal outcome. The specific plan or protocol for conducting the study is descriptive case series. This retrospective study was carried out from May 2011 to May 2012 in the department of Gynecology and Obstetrics (Unit-I) of Liaquat University of Medical & Health Sciences Sindh. A total 1225 women irrespective of reproductive age, social economic, educational and residential status were included in the study. Women with other medical disorders except anemia were excluded from the study. The women who fulfilled the inclusion criteria were interviewed and the data was recorded on a predesigned proforma that recorded the Hb estimation, gest age, BMI, Parity, perinatal outcome (live birth, still birth, intrauterine death(IUD), IUGR (in intrauterine growth restriction).Univariate analysis was performed and also multivariate analysis was undertaken to control for confounding factors. Among 1225 women, 688were anemic (Hb< 11gm) prevalence of anemia was (56.1%). Risk of preterm delivery was 56.25%. Antepartum hemorrhage was found in 44(6.4%) patients. Retained placenta in 9(1.3%). PPH was found in 28(4.1%). Sepsis was noted in 125(18.2%). Maternal death occurred in 6(0.9%). Low birth weight was found in 96(14.0%).Perinatal mortality was 16(2.3%). Intrauterine death in 61(8.9%), low Apgar score at 1 minute was 69(10.0%) and at 5 minute was 16(2.3%) respectively. Anemia in pregnancy is associated with adverse maternal and perinatal outcome.

Key words:Anemia, Maternal outcome premature birth, perinatal mortality.

INTRODUCTION

Anemia in pregnancy constitutes a major public health problem in developing countries and a high morbidity and mortality among antenatal mothers (NikRosmawati et al., 2012; Idowu et al., 2005; McLean et al., 2009; Rasheed et al., 2008).

Anemia is defined as the condition in which there is decreased level of hemoglobin than the normal or there is decreased number of RBC's than the normal value (Beutler and Waalen, 2006; Breyman, 2001).

WHO has recommended a cut off value of 11.0 g/dl for hemoglobin to define anemia at any time during pregnancy (Rizwan et al., 2010). Anemia is a common problem of underdeveloped countries. Patients of anemia usually have various symptoms especially generalized weakness, easy fatigability and poor concentration etc. If anemia is marked and prolonged it may precipitate cardiac problems. Anemia in pregnancy is a special issue. Here anemia has deleterious effects both on mother as well as on growing fetus (Lone et al., 2004). It may lead to premature delivery, low birth weight and fetal death. Adverse fetal outcome and perinatal complications associated with anemia have also been reported from Pakistan (Khan, 2001; Pathak et al., 1999). By correction

*Corresponding author. E-mail: naushabarizwansyed@yahoo.com. Tel: 0300-3058246.

of anemia at proper time we can improve maternal and fetal outcome (Letsky et al., 1980).

During pregnancy, plasma volume expands by 46 to 55%, whereas red cell volume expands by 18 to 25%. The resulting haemodilution has been, perhaps wrongly, termed physiological anaemia of pregnancy. There are insufficient data to give physiological limits for the expected haemodilution. In most published studies the mean minimum normal haemoglobin in healthy pregnant women living at sea level is between 11 and 12 g/dL (Letsky, 1995; Susan 2008). The aim of our study was to determine the impact of anaemia on maternal and perinatal outcome.

METHODOLOGY

A retrospective observational study was carried out from May 2011 to May 2012. A total number of 34200 women were delivered during the study period. Of these we included all the women who fulfilled the criteria that is, all women with haemoglobin less than 7.0 g, were included in the study. Women with other medical illness except anaemia were excluded from the study. The women who fulfilled the inclusion criteria were interviewed and the data was recorded on a predesigned proforma that recorded the Hb estimation, gest age, BMI, Parity, perinatal outcome (live birth, still birth, intrauterine death(IUD), in intrauterine growth restriction (IUGR). Preterm delivery was defined as delivery after 24 and before 37 completed weeks of gestation. The weight of newborns and their apgar score at 1 and 5 min were recorded.

Statistical analysis

The data were entered and analyzed in statistical program SPSS version 16.0. The qualitative data (frequencies and percentages) such as maternal outcome that is, preterm, abruption placenta, retained placenta, PPH, sepsis and maternal death and perinatal outcome including low birth weight, perinatal mortality, apgar score and intrauterine death etc. were presented as n(%). Univariate analysis was performed and also multivariate analysis was undertaken to control for confounding factors. Chi square test was applied to compare the proportions between anemic and non-anemic women. All data were calculated on 95% confidence interval. A p value < 0.05 was considered as statistically significant level.

RESULTS

A total of 1225 women were studied, 688 were in the anemic group and 537 were in the non anemic group. The prevalence of anemia was 56.1%. Most of the

women in both groups were Muslims, urban dwellers and spoke the national language Urdu. There were no statistically significant differences between the groups in terms of educational level (most up to Grade 10, employment status (most were housewives), family structure (most lived in extended families).

Risk of preterm delivery was higher in anemic group 56.25% (95% CL: 0.05-0.09). Risk of abruptio placentae was 6.4% (95% CL: 2.1-9.6). Similarly there was a high risk of retained placenta 1.3% (95% CL: 0.7-16.4), PPH 4.1% (95% CL: 1.9-16.2) respectively.

A high incidence of sepsis was found in women who were referred from rural areas after being manipulated by TBAs at home 18.2% (95% CL: 10.8-80.6). There was a high risk of maternal death in anemic women 0.9% (95% CL: 0.5-39.2) (Table 1).

There was a high risk of low birth weight 14.0% (95% CL: 1.2-2.7), perinatal mortality 2.3% (95% CL: 0.5-2.4), low apgar score at one minute 8.9%, at 5 min 10.0%, respectively. The risk of intrauterine death also high among anemic women 2.3% (95% CL: 0.9-6.9) (Tables 2 and 3).

DISCUSSION

Anaemia during pregnancy is a significant public health problem. Anaemia diagnosed in pregnancy is associated with increased risks of low birth weight and preterm delivery. Iron deficiency is the most commonly recognized nutritional deficit in either the developed or the developing world (McLean et al., 2009). Anaemia can result in a wide variety of adverse outcomes including diminished work capacity, impaired thermoregulation, immune dysfunction, gastrointestinal disturbances and neurocognitive impairment (van de Broek, 1998; Walter et al., 1989).

A high proportion of women in both Industrialized and developing countries become anaemic during pregnancy. Estimates from the world health organization report that from 35 to 75% (56% on average) of pregnant women in developing countries and 18% of women from industrialized countries are anaemic (WHO, 1968, 1992; Lindsay, 2000).

Our study shows an increased incidence of maternal morbidity and mortality in anaemic women. Maternal mortality due to anaemia in selected developing countries ranges from 27 (India) to 194 (Pakistan) deaths per 100,000 live births. Our study shows that relation of maternal mortality with anaemia reflected a greater extent of hemorrhage and late arrival at admission rather than the effect of a prenatal anaemic condition. Similar observation was found in the other study (Garn et al., 1981).

Our results show a high incidence of preterm delivery, LBW, IUD and perinatal mortality. Prematurity was the leading cause of perinatal death. Similar results were

Table 1. Univariate analysis of maternal outcome among anemic and non-anemic women (n = 1225).

Maternal complications	Anemic < 11 g (n = 688)	Non-anemic > 11 gm (n = 537)	Total	Adjusted relative risk	95% CI	P value
Preterm						
Yes	387(56.25%)	108(20.11%)	495(40.4%)	0.07	0.05-0.09	< 0.0001
No	150(21.80%)	580(108.0%)	730(59.6%)			
Abruptio placenta						
Yes	44(6.4%)	8(1.5%)	52(4.2%)	4.5	2.1-9.6	< 0.0001
No	644(93.6%)	529(98.5%)	1173(95.8%)			
Retained Placenta						
Yes	9(1.3%)	2(0.4%)	11(0.9%)	3.5	0.7-16.4	0.12
No	679(98.7%)	535(99.6%)	1214(99.1%)			
PPH						
Yes	28(4.1%)	4(0.7%)	32(2.6%)	5.6	1.9-16.2	< 0.0001
No	660(95.9%)	533(99.3%)	1193(97.4%)			
Sepsis						
Yes	125(18.2%)	4(0.7%)	129(10.5%)	29.5	10.8-80.6	< 0.0001
No	563(81.8%)	533(99.3%)	1096(89.5%)			
Maternal Death						
Yes	6(0.9%)	1(0.2%)	7(0.6%)	4.7	0.5-39.2	0.14
No	682(99.1%)	536(99.8%)	1218(99.4%)			

Table 2. Univariate analysis of perinatal outcome among anemic and non-anemic women (n = 1225).

Perinatal complications	Anemic < 11gm (n = 688)	Non-anemic > 11gm (n = 537)	Total	Adjusted Relative risk	95% CI	P value
Low birth weight						
Yes	96(14.0%)	43(8.0%)	139(11.3%)	1.86	1.2-2.7	0.001
No	592(86.0%)	494(92.0%)	1086(88.7%)			
Perinatal Mortality						
Yes	16(2.3%)	11(2.0%)	27(2.2%)	1.13	0.5-2.4	0.84
No	672(97.7%)	526(98.0%)	1198(97.8%)			
Low apgar at 1 min						
Yes	61(8.9%)	38(7.1%)	99(8.1%)	1.27	0.8-1.9	0.29
No	627(91.1%)	499(92.9%)	1126(91.9%)			
Low apgar at 5 min						
Yes	69(10.0%)	43(8.0%)	112(9.1%)	1.28	0.8-1.9	0.23
No	619(90.0%)	494(92.0%)	1113(90.9%)			
Intrauterine death						
Yes	16(2.3%)	5(0.9%)	21(1.7%)	2.53	0.9-6.9	0.07
No	672(97.7%)	532(99.1%)	1204(98.3%)			

Table 3. Multivariate analysis of maternal and perinatal outcome among anemic and non-anemic women (n = 1225).

Maternal complications	Odds ratio	95% CI	P value
Preterm	5.98	9.9-0.6	< 0.0001
Abruptio placenta	0.37	0.1-0.9	0.032
Retained placenta	0.03	0.06-0.16	< 0.0001
PPH	0.42	0.05-3.3	0.41
Sepsis	0.004	0.01-0.01	<0.0001
Maternal Death	0.09	0.07-1.32	0.08
Perinatal complications			
Low birth weight	0.96	0.57-1.6	0.90
Perinatal mortality	1.26	0.35-4.4	0.71
Low apgar at 1 min	0.78	0.44-1.3	0.40
Low apgar at 5 min	0.57	0.32-1.0	0.06
Intrauterine death	0.68	0.17-2.6	0.58

found in other studies (Allen, 1993; Mitchell, 1992; Harrison and Ibeziako, 1973; Cutner et al., 1999).

Health education and adequate prenatal care may be important in potentially reducing the risks associated with anaemia during pregnancy. Efforts must be made to address the problem through strategies such as fortification and periodic supplementation and counseling of women of the risks of anaemia during pregnancy. This may help to reduce the manifestation of iron deficiency, improve public health and thus reduce maternal and neonatal morbidity and mortality.

Conclusion

Maternal anaemia in pregnancy is associated with increased risks of adverse maternal and perinatal outcome. Efforts must be made to reduce the prevalence of anaemia especially during pregnancy.

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