

Anemia and its impact on Pregnancy Outcome in Patients, at University Hospital, Hyderabad Sindh, Pakistan

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Abstract

Background: Anemia is a global problem in pregnant women involving 30 million pregnant ladies throughout the world. This is also a spreading disorder in Pakistan especially in Hyderabad. The present study was conducted to acknowledge the anemic status of pregnant women in Hyderabad.

Methodology: the study was conducted in the gynae and Obs department of Liaquat University of Medical and Health Sciences. The study was conducted during the period of Dec 2018 to March 2018.

Result: Out of 200 participants 175 (75%) were anemic. The prevalence of anemia was 25% in each group. The severity of APH increased with intensity of anemia (28.5% total with p value 0.000). The PPH also increased with severity of anemia. The most incidences were found in moderate anemia (46%). The p value was 0.000. The incidence of abortion also increased with severity of anemia. It was 54% in severe anemia (P value 0.000). The incidence of still birth was most abundant in severe anemia i.e. 28% (P value 0.000). 46% incidence of birth asphyxia was noted in severe anemia. The incidence of anemia increases as duration between delivery decreases (86% in 1 year duration). The increased incidence of anemia was found in participants who did not take IFA tablets and did not attend the ANC clinic. The incidence of IUGR and fetal distress also increased with severity of anemia.

Conclusion: A high prevalence of anemia was found in the pregnant patients producing both maternal and fetal mortality and morbidity.

Keywords: Anemia, pregnancy, outcome

Introduction

Pregnancy is the center of all the hopes and pleasure in one's marriage life but these dreams can be in danger when they face the trouble of anemia during pregnancy.¹ WHO define anemia as, A condition in which the hemoglobin level falls below 11g/dl^{9,13} WHO categorizes anemia as normal if it is 11g/dl, milder if lies between 10-11g/dl, moderate if it ranges between 07-10 g/dl and severe if it is less than 7g/dl. In Pakistan anemia is most prevalent due to nutritional deficiency rather than other causes. Anemia is the most prevalent problem in the low socio-economic section of the Pakistani society. The most important factor in high prevalence of anemia is low income, behavior of peoples and their cultural stigmas.^{11, 3}

During the 2nd and the 3rd trimester plasma volume increases by 25-80% leading to decrease in RBC and oxygen carrying capacity.¹³ Hypercoagulability develops in

pregnancy due to increase in the activity of clotting factors but this is counteracted by increase in the volume of plasma leading to relative decrease in RBC count, culminating in anemia.⁴

The decreased hemoglobin leads to decreased oxygen carrying capacity in circulation. Anemia may be produced by decreased RBC production from bone marrow, decreased iron, folic acid, bone marrow suppression by drugs and radiation, chronic parasitic infestation or genetic disorder. About 43% pregnant women of eastern countries and 9% of western countries are suffering from anemic disorder.¹⁶

Anemia is the outcome of poor social development in the society, high parity, low health facilities in the region, illiteracy, poverty, poor socioeconomic facilities and diet devoid of balanced nutrition.²¹ WHO, American Congress of Obstetricians and Gynecologists (ACOG), and the Centers for Disease Control and Prevention (CDCP), consider iron deficiency as the major cause of anemia, strongly favors iron supplementation during pregnancy.²³

Anemia leads to early fatigue, lethargic, headache, vertigo and change of color. Anemia leads to renal failure,

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cardiac failure and severe maternal and fetal complications.²³ Nutritional mismanagement is the one of the most important factor in the development of anemia. According to WHO, 41.8% pregnant women are suffering from this diseases throughout the world. Most of the gynecologist and obstetrician are of the view that that anemia directly influences the outcome of pregnancy.¹⁹ WHO consider iron deficiency anemia as the leading cause of complication in south Asia. One of the most impotent factors includes dietary deficiency of iron, infestation with worms, malarial infection and decrease folic acid intake in diet.²⁰ Anemia is the leading factor involved in maternal and fetal complications including mortality and morbidity. The major complications involving mother include, APH, PPH, premature labor and sepsis complication in puerperium.^{8,9}

The fetal risk involves IUGR, fetal distress, perinatal death and iron deficiency in fetus.^{24, 10} Anemia has produced a grave situation throughout the world with estimated 14% pregnant women in the western world and 51% in the south East Asian countries are suffering from this problem. Though health departments of this region has done quite a lot to supply iron and folic acid supplement but the incidence of anemia in pregnancy is not coming down.¹⁵

About 1.62 billion peoples suffering from anemia.¹⁸ According to who more than 50% of Pakistani pregnant women are suffering from anemia while about 51% non pregnant are suffering from anemia.⁶

The national survey of United States narrates that 5.4% pregnant women in America are suffering from iron deficiency anemia.²⁵ The peak prevalence rate is present in Africa with tally reaching up to 61.3%.about 20% of maternal death occurs throughout the world.² Anemia is the one of most important factor determining the pregnancy outcome.¹⁴ Maternal and fetal complications increase with anemia.⁵

Pregnant women suffering from anemia suffer more from complications such as birth asphyxia, eclampsia and pyrexial complications in post partum period.¹² Anemia leads to low apgar score, fetal and maternal complication.³ A previous history shows hemoglobin less than 8g/dl leads to increase incidence of pph, low birth weight and preterm babies.¹⁷ PPH is one of the most frequent outcomes of maternal mortality in anemia.⁷ In south East Asia anemia leads to 80% of maternal death²²

Methodology

This Prospective Observational study was conducted in the Gynae and Obs department of liaquat university of Medical and Health Sciences. The study was conducted during the period of dec 2018 to march 2018. 200 patients were selected by simple random sampling method of which 150 were anemic who were divided in four groups. Informed consent was taken from the patients and all the pregnant women who were willing to participate in the study were included. Diabetes

mellitus, hypertension, tobacco smoking and who were not willing for taking part in the study. Ethical Committee approval was taken for the study. The information regarding age, parity, interval between pregnancies, gestational age, maternal and fetal complications were entered in an especially designed questioner Performa. The level of hemoglobin was obtained from the lab investigation which was conducted from the research lab of LUMHS Hyderabad. The anemic level of women was structured according to WHO recommendation. Data was analyzed on Spss version 16. All the data entered was categorical. Frequency and cross tabs were used to analyze the result. Chi-square test was applied to verify the result.

Results

Table 1 shows age wise distribution of participants. They were divided into three groups. Group one comprised of 59 participants (29.5%) of below 20 years of age group. Group 2 comprised of 61 participants (30.5%) of between 20-30 years of age. Group 3 comprised of 80 participants (40%) of between 30-40 years of age group)

Table 2 shows frequency of anemia. 50 (25%) were not anemic. 50 (25%) were mild anemic 50 (25%) were moderate anemic and 50 (25%) were severely anemic

Table 3 shows association of anemia to APH. The participants who were in the not anemic group only 2 (4%) shows APH. The participants of mild anemic group suffer 5 (10%). The moderate anemic suffer 17 (34%) while the severely anemic showed 33(66%).

Table 4 shows association of anemia to PPH. The participants of not anemic group show 4% of PPH. The mild anemic group shows 14% of suffered from PPH. The moderate anemic group showed 46% of PPH while the severe group showed 30% involvement. a total of 23.5% suffered from PPH. The p value was 0.000 significant

Table 5 shows association of anemia to abortion. The non anemic group shows 4% suffering from abortion. The mild anemic showed 18% abortion. The moderate group showed 40% while the severe group showed 54% suffering from abortion. Total of 29% suffered from abortion. The P value was 0.000.

Table no 6 shows association of anemia to stillbirth. 2% of non anemic group showed stillbirth. 16% of mild anemic group shows stillbirth. 28% of moderate anemic participants showed stillbirth while 12% showed stillbirth babies.

Table no 7 shows association of anemia to birth asphyxia. 25 o non anemic group suffered from birth asphyxia. 16% of mild anemic group suffered from birth asphyxia. 38% from moderate anemic group suffered from birth asphyxia while 46% from the severely anemic group suffered from birth asphyxia. A total of 25.4% suffered from birth asphyxia. P value of 0.000 was noted.

Table no 8 shows association of anemia to LCS. The non anemic group shows only 85 of participants undergoing LCS. The mild group showed 18% of frequency. The

moderate group shows 36% of LCS while the severely anemic group showed 84% of LCS. A total of 36.5 % showed association of anemia to LCS. The P value was 0.000.

Table no 9 showing association of anemia to duration between pregnancy, the non anemic group shoed 100% participants showed more than 2 years of duration between pregnancy. The mild anemic group showed 100% an interval of more than 2 years.The moderate anemic group showed 16% of 1 year interval and 84% of more than 1 year. The severely anemic group showed 86% of only 1 years of interval 14% of more than 1 year. The p value was 0.000.

Table no 10 showing association of anemia to education. The non anemic group showed 100% education. The mild anemic group showed 84% education. The moderate group showed 38% education while the severly anemic group showed only 20% of education. The P value was 0.000.

Table no 11 shows association of anemia to income of the family. 50% of participants from the non anemic group belong to middle and rich families. In the mild anemic group 64% were from the middle class. In the moderate anemic group 76% were from the middle class. The severe group 78% was from the poor class. The P value was 0.000.

Table no 12 shows association between anemia and parity. The non anemic group was 50% both primipara and multipara. In the mild group 88% were from the primipara group. In the moderate anemic group 50% of both categories were suffering but 80% of multipara were suffering from severe anemia. The P value was 0.000.

Table no 13 showing association of anemia to IFA tablets. In the mild anemic group 100% were taking IFA tablets. In the mild anemic group 90% were not taking pills. In the moderate anemic group 80% were not taking pills while in severely anemic group 94% were not taking PILLS. The P value was 0.000.

Table no 14 shows association of anemia with ANC visits. The non anemic group regularly 100% visited ANC clinics. The mild anemic group showed only 5% visiting the clinics. The moderate anemic group showed only 16% visiting the clinics. The severe anemic group showing only 8% visiting ANC clinic. The P value was 0.000.

Table no15 shows association of anemia to IUGR. It was 6% in non anemic group. Mild group shows 18%, moderate shows 28% while severe anemic group shows 44%.

Table no 16 shows association of anemia to fetal distress. 85 % of non anemic group, 22% of mild group, 32% of moderate group and 44% of severe group were suffering from fetal distress. P value was 0.002.

Table 1 Shows age wise distribution of participants

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 20 years	59	29.2	29.5	29.5
	between 20-30 years	61	30.2	30.5	60.0
	between 30-40 years	80	39.6	40.0	100.0
	Total	200	99.0	100.0	
Missing	System	2	1.0		
Total		202	100.0		

Table 2 Showing frequency of anemia

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not anemic	50	24.8	25	25
	mild anemic	50	24.8	25	50
	Moderate anemic	50	24.8	25	75
	severe anemic	50	24.8	25	100
	Total	200	99	100	
Missing	System	2	1		
Total		202	100		

Table 3 Shows association of anemia to APH

		APH		Total	P value
		yes	no		
anemia	not anemic	Count	2	48	50
		% within anemia	4.0%	96.0%	100.0%
	mild anemic	Count	5	45	50
		% within anemia	10.0%	90.0%	100.0%
	moderate anemic	Count	17	33	50
		% within anemia	34.0%	66.0%	100.0%
	severe anemic	Count	33	17	50
		% within anemia	66.0%	34.0%	100.0%
Total		Count	57	143	200
		% within anemia	28.5%	71.5%	100.0%

Table 4 Shows association of anemeia to PPH anemia

			PPH		Total	P value
			yes	no		
anemia	not anemic	Count	2	48	50	0.000
		% within anemia	4.0%	96.0%	100.0%	
	mild anemic	Count	7	43	50	
		% within anemia	14.0%	86.0%	100.0%	
	moderate anemic	Count	23	27	50	
		% within anemia	46.0%	54.0%	100.0%	
	severe anemic	Count	15	35	50	
		% within anemia	30.0%	70.0%	100.0%	
Total	Count	47	153	200		
	% within anemia	23.5%	76.5%	100.0%		

Table no 5 Shows association of anemia to abortion

			abortion		Total	P value
			yes	no		
anemia	not anemic	Count	2	48	50	0
		% within anemia	4.00%	96.00%	100.00%	
	mild anemic	Count	9	41	50	
		% within anemia	18.00%	82.00%	100.00%	
	moderate anemic	Count	20	30	50	
		% within anemia	40.00%	60.00%	100.00%	
	severe anemic	Count	27	23	50	
		% within anemia	54.00%	46.00%	100.00%	
Total	Count	58	142	200		
	% within anemia	29.00%	71.00%	100.00%		

Table no 6 Shows association of anemia to still birth

			stillbirth		Total	P value
			yes	no		
anemia	not anemic	Count	1	49	50	0.003
		% within anemia	2.00%	98.00%	100.00%	
	mild anemic	Count	8	42	50	
		% within anemia	16.00%	84.00%	100.00%	
	moderate anemic	Count	14	36	50	
		% within anemia	28.00%	72.00%	100.00%	
	severe anemic	Count	6	44	50	
		% within anemia	12.00%	88.00%	100.00%	
Total	Count	29	171	200		
	% within anemia	14.50%	85.50%	100.00%		

Table no 7 Shows association of anemia to * birth asphyxia

			birth asphyxia		Total	P vau
			yes	no		
anemia	not anemic	Count	1	49	50	0
		% within anemia	2.00%	98.00%	100.00%	
	mild anemic	Count	8	42	50	
		% within anemia	16.00%	84.00%	100.00%	
	moderate anemic	Count	19	31	50	
		% within anemia	38.00%	62.00%	100.00%	
	severe anemic	Count	23	27	50	
		% within anemia	46.00%	54.00%	100.00%	
Total	Count	51	149	200		
	% within anemia	25.50%	74.50%	100.00%		

Table no 8 Showing association of anemia to duration between pregnancy anemia * duration between delivery Crosstabulation

			duration between delivery			Total	P value
			1 year	more then 1 year	more then 2 years		
anemia	not anemic	Count	0	0	50	50	0.000
		% within anemia	.0%	.0%	100.0%	100.0%	
	mild anemic	Count	0	0	50	50	
		% within anemia	.0%	.0%	100.0%	100.0%	
	moderate anemic	Count	8	42	0	50	
		% within anemia	16.0%	84.0%	.0%	100.0%	
	severe anemic	Count	43	7	0	50	
		% within anemia	86.0%	14.0%	.0%	100.0%	
Total	Count	51	49	100	200		
	% within anemia	25.5%	24.5%	50.0%	100.0%		

Table no 9 Showing association of anemia to education anemia * education Crosstabulation

			education		Total	P value
			illeterate	educated		
anemia	not anemic	Count	0	50	50	0.000
		% within anemia	.0%	100.0%	100.0%	
	mild anemic	Count	8	42	50	
		% within anemia	16.0%	84.0%	100.0%	
	moderate anemic	Count	31	19	50	
		% within anemia	62.0%	38.0%	100.0%	
	severe anemic	Count	40	10	50	
		% within anemia	80.0%	20.0%	100.0%	
Total	Count	79	121	200		
	% within anemia	39.5%	60.5%	100.0%		

Table no 10 Shows association of anemia to income of the family anemia * income Crosstabulation

			Income			Total
			poor	middle class	rich	
anemia	not anemic	Count	0	25	25	50
		% within anemia	.0%	50.0%	50.0%	100.0%
	mild anemic	Count	7	32	11	50
		% within anemia	14.0%	64.0%	22.0%	100.0%
	moderate anemic	Count	12	38	0	50
		% within anemia	24.0%	76.0%	.0%	100.0%
	severe anemic	Count	39	11	0	50
		% within anemia	78.0%	22.0%	.0%	100.0%
Total	Count	58	106	36	200	
	% within anemia	29.0%	53.0%	18.0%	100.0%	

Table no 11 Shows association between anemia and parity anemia * parity Crosstabulation

			parity		Total	P value
			primipara	multipara		
anemia	not anemic	Count	25	25	50	0.000
		% within anemia	50.0%	50.0%	100.0%	
	mild anemic	Count	44	6	50	
		% within anemia	88.0%	12.0%	100.0%	
	moderate anemic	Count	25	25	50	
		% within anemia	50.0%	50.0%	100.0%	
	severe anemic	Count	10	40	50	
		% within anemia	20.0%	80.0%	100.0%	
Total	Count	104	96	200		
	% within anemia	52.0%	48.0%	100.0%		

Table no 12 Showing association of anemia to IFA tablets anemia * IFA tabltls Crosstabulation

			IFA tabltls		Total	P value
			taken	not taken		
anemia	not anemic	Count	50	0	50	0.000
		% within anemia	100.0%	.0%	100.0%	
	mild anemic	Count	5	45	50	
		% within anemia	10.0%	90.0%	100.0%	
	moderate anemic	Count	10	40	50	
		% within anemia	20.0%	80.0%	100.0%	
	severe anemic	Count	3	47	50	
		% within anemia	6.0%	94.0%	100.0%	
Total		Count	68	132	200	
		% within anemia	34.0%	66.0%	100.0%	

Table no13 Shows association of anemia to IUGR anemia * IUGR Crosstabulation

			IUGR		Total	P value
			yes	no		
anemia	not anemic	Count	3	47	50	0.000
		% within anemia	6.0%	94.0%	100.0%	
	mild anemic	Count	9	41	50	
		% within anemia	18.0%	82.0%	100.0%	
	moderate anemic	Count	14	36	50	
		% within anemia	28.0%	72.0%	100.0%	
	severe anemic	Count	22	28	50	
		% within anemia	44.0%	56.0%	100.0%	
Total		Count	48	152	200	
		% within anemia	24.0%	76.0%	100.0%	

Discussion

This study was designed to access the effect of anemia on pregnancy. It was noted that the complications that occurred were on a higher edge in anemic patients then those of non anemic patients (p value < 0.005). The complications were studied by dividing the anemic patients into mild, moderate and severe categories. It was found that in most of the cases, the complications increased as the severity of anemia increased. It was noted that not only maternal complications e.g. APH, PPH and abortion increased but fetal complications e.g. fetal distress, birth asphyxia and IUGR also increased. In this study effect of socioeconomic condition of patients and their education was correlated with anemia. It was noted that incidence of anemia was low in better educated and middle class families as compared to low socioeconomic group and illiterate patients. It was also noted that low level of complications occurred in patients who attended ANC clinics and consumed IFA tablets regularly.

Conflict of interest: None to declare

References

[1]. Abiselvi A, Gopalakrishnan S.1, Umadevi R.1 *et al*, Socio-demographic and obstetric risk factors of anaemia among pregnant women in rural Tamil Nadu, Int J Community Med Public Health. 2018 ;5(2):721-727
 [2]. Abel G and Afework M. Prevalence of Anemia and Associated Factors among Pregnant Women in North

Western Zone of Tigray, Northern Ethiopia: A Cross-Sectional Study. J Nutri Metabolism, 2015, 1-7.
 [3]. Bekele A, Tilahun M, Mekuria A. Prevalence of Anemia and Its Associated Factors among pregnant Women Attending Antenatal Care in Health Institutions of Arba Minch Town, Gamo Gofa Zone, Ethiopia A Cross-Sectional Study, Hindawi Publishing Corporation, 2016, 1-9
 [4]. Buzyan LO. Mild anemia as a protective factor against pregnancy loss. Int J Risk Saf Med. 2015;27(1):7-8.
 [5]. Derso T, Abera Z, Tariku A. Magnitude and associated factors of anemia among pregnant women in Dera District: a cross-sectional study in northwest Ethiopia, BMC Res Notes. 2017;10,(1):359.
 [6]. Faseeh S, Fazli R, Aymen S, Sehrish S. Frequency of anaemia in patients presenting to tertiary care hospital in peshawar (pakistan), KMUJ 2015;7(1):30-33.
 [7]. Ferguson MT, Dennis AT. Defining peri-operative anemia in pregnant women- challenging the status quo. Anesthesia. 2019;74(2):237-245.
 [8]. Gopinath A *et al*. Prevalence and factors influencing anaemia among pregnant women in rural Mysuru, India, Int J Community Med Public Health. 2016;3(4):968-972
 [9]. Grum T, Brhane E, Hintsu S, Kahsay G Magnitude and factors associated with anemia among pregnant women attending antenatal care in public health centers in central zone of Tigray region, northern Ethiopia: a cross sectional study, BMC Pregnancy Childbirth. 2018 18(1):433.
 [10]. Hasina A C, Rumana K, Fatema J, Jesmin A *et al*, Factors associated with maternal anemia among pregnant women in Dhaka city, BMC Women's Health. 2015;15:77.
 [11]. Ingle1P V, Patil S D, Patel J M , Dighore P N, S. J. Suraa s J, Anaemia as a Risk Factor for Maternal-Perinatal Complications and Pregnancy Outcomes in Pregnant Womens, J Pharmaceu Res & Clin Prac, 2015; 5(3):1-7.

- [12]. Li Lin, Yumei Wei, Weiwei Zhu, Chen Wang, Prevalence, risk factors and associated adverse pregnancy outcomes of anaemia in Chinese pregnant women: a multicentre retrospective study, *BMC Pregnancy and Childbirth*, 2018;18(1):111.
- [13]. Manpreet K, Aarti C, Dilshad Manzar M D, Mohammad Muntafa R, Maternal Anaemia and Neonatal Outcome: A Prospective Study on Urban Pregnant Women, *Journal of Clinical and Diagnostic Research*. 2015;9(12):4-8 .
- [14]. Mangla M, Deepak S *et al.* Prevalence of anaemia among pregnant women in rural India: a longitudinal observational study, *Int J Reprod Contracept Obstet Gynecol*. 2016;5(10):3500-3505.
- [15]. Mridul M, Mridul M, High prevalence of anaemia in pregnant women of Lakhimpur District of Assam, *Indian Journal of Basic and Applied Medical Research*; 2014;3(4):314-321.
- [16]. Nair M, Manisha Nair, Manoj K Choudhury, Saswati S *et al.* Association between maternal anaemia and pregnancy outcomes: a cohort study in Assam, India, *BMJ Glob Health* 2016;1(1):
- [17]. Obai G, Odongo P, Wanyama R. Prevalence of anaemia and associated risk factors among pregnant women attending antenatal care in Gulu and Hoima Regional Hospitals in Uganda: A cross sectional study, *MC Pregnancy Childbirth*. 2016 11;16:76.
- [18]. Jagti P. Prevalence of nutritional anemia in pregnant women in selected slum areas under the Cuttack municipal corporation - A field study, *International Journal of Home Science* 2017; 3(2): 147-150
- [19]. Paladugu RK, Radha K, Paladugu1, Srinivas Jagath P *et al.* Prevalence and outcome of anaemia among pregnant women attending tertiary care hospital in Visakhapatnam *Int J Community Med Public Health*. 2018;5(1):203-205
- [20]. Ravishankar S, Muninarayana C, Anil Navale S, Prathima S, Sheela S.R. Prospective study on prevalence of anemia of pregnant women and its outcome: A community based study, *J Family Med Prim Care*. 2017;6(4):739–743
- [21]. Ravishankar S, Anil Navale Santhuram, Muninarayana Chandrappa, Prathima Shivajirao, Sheela Shikaripur Rangappa, Prevalence of anemia among pregnant women in rural population of Kolar district *International Journal of Medical Science and Public Health*.2016;5(03):454-458.
- [22]. Shristi R, Stefanie N. Hinkle1 *et al.* A longitudinal study of body iron status during pregnancy and risk of gestational diabetes: findings from a prospective, multiracial cohort, *Diabetologia*. 2017;60(2): 249–257.
- [23]. Shwetha, Prasad K.N. "Prevalence of anemia among pregnant women--A cross-sectional study." *International Journal of Medical Science and Public Health*, 2018;7(12):1023.
- [24]. Yuan Ru, Eva K Pressman, Elizabeth M Cooper, Ronnie Guillet, Philip J Katzman, Tera R Kent. Iron deficiency and anemia are prevalent in women with multiple gestations, *Am J Clin Nutr* 2016;104:1052–60.