Original Article

The impact of anemia and iron supplementation during pregnancy in St. Philomena's hospital, Bangalore, India

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Abstract

Objective: the main objective of the study was to investigate the impact of anemia in pregnancy. **Methodology:** it was a prospective observational study conducted in the gynecology ward, St. Philomena's hospital, Bangalore, India, conducted for 6 months from October 2016 to March 2017. The participants were all inpatients women who were pregnant and anemic. The patient data collection was used to collect all the details like inpatient number, age, gender, social history, history, laboratory data, diagnosis, and therapeutic management. All inpatients were those diagnosed with and without anemia in pregnancy. The prescription guidelines, Micromedex, were collected and then compared with guidelines. When the analysis of prescription was completed, all data entered into the appropriate software and the results were obtained. **Results:** The present study showed that from a total of 110 patients included in this study, anemia was confirmed in 50 patients of them. Among these, 28 (25.4%) patients were diagnosed as mild anemic, 20 (18.1%) as moderate, and 2 (1.8%) as severe anemic patients. The results of this study showed that LBW is higher in anemic women (n=19, 25%) compared to non-anemic (n=17, 21%). Besides, the majority of newborns (n=66, 59.9%) were male. **Conclusion:** Factors associated with anemia in pregnancy were caste, dietary – habits, education, occupation, socioeconomic status, ANC visit, iron, and folic acid supplementation, whereas residence, religion, number of children, type of family, and inter-pregnancy interval (months), were not associated. These should be improved by providing proper ANC services. More low-birth-weight (LBW) babies were born to anemic mothers. Anemia in pregnancy may be reduced by proper iron and folic acid supplementation which can be improved through providing proper ANC services. Anemia has also a recognizable association with fetal outcome.

Keywords: Anemia, Iron supplementation, Pregnancy

Introduction

Anemia in pregnancy is a typical marvel in low-and center pay nations, and it is because of a decrease in the hemoglobin focus notwithstanding an expansion in the red cell mass. Anemia may cause draining inconveniences in the mother all through the pregnancy period, in labor, and after the infant is conceived, just as impeded development of the baby [1]. The reason for anemia in pregnant ladies is chiefly because of iron deficiency, and its pervasiveness in agricultural nations is high [2]. Iron deficiency anemia (IDA) in pregnant women has been portrayed as a quiet executioner; in this manner, additional iron supplementation or treatment should be given to building Hb [3]. Low admission of miniature supplements is assumed to have a significant job; hence, pregnant women are urged to burn-through routine iron/folate supplementation or in any case Fe-containing food [1]. The WHO suggests oral iron supplementation consistently as much as 30–60 mg to have the option to meet iron necessities [2], particularly in the third trimester of pregnancy [4]. In Indonesia, the government endeavors to forestall anemia, and iron supplementation has been given, as a public program [5]. Although this program for managing iron supplementation has been continuing for quite a while, the pervasiveness of anemia in pregnant women is still high [6], adding to obstetric entanglements.

Regardless of much exploration, the connection between anemia and unfriendly pregnancy result is indistinct. The proof that maternal anemia can lessen a pregnant lady's capacity to withstand abrupt blood misfortune or that it expands the danger of unconstrained fetus removal, preterm conveyance, low birth weight, and maternal mortality [6-9] is inconclusive. [10-12] Associations between maternal anemia and antagonistic pregnancy result might be better clarified by different elements. For instance, women who convey before the 35th, seven day stretch of incubation (a considerable lot of whom have low-birthweight infants) will have lower hemoglobin levels in light of pregnancy-related

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hemodilution. [7, 8] The connection between maternal anemia and mortality in non-industrial nations might be represented by contrasts in the financial status of pallid and nonanemic women. More well-off women eat better, are less weak, and present themselves immediately (and in better condition) to medical care offices for conveyance or pregnancy end than unfortunate women. Women who get speedy administration via prepared suppliers are bound to endure obstetric difficulties compared with the individuals who do not.

Iron supplementation is prescribed during pregnancy to address or forestall iron deficiency, [6, 7, 13] because dietary utilization of iron is probably not going to meet the everyday dietary suggestion of 30 mg. [14] Iron absorption for the most part is poor in very much sustained women, although it improves in pregnancy. Absorption relies upon the type of iron ingested and the organization of the eating regimen (tea and phytates restrain absorption). [8] Heme iron is more productively retained than nonheme iron; however, it is accessible just from creature nourishments that, by and large, are moderately costly, and thusly less inclined to be consumed by helpless women. Iron absorption might be especially poor where parasitic and irresistible sicknesses, including jungle fever, are common, although absorption might be more productive in light of iron deficiency. [7, 14]

In India, anemia contributes straightforwardly to 20% of maternal passing and in a roundabout way to add 20%. [2, 3] The fundamental driver of anemia in the agricultural nations in antenatal women incorporates, low dietary admission of iron and folic corrosive, poor bioavailability of iron and fiber-rich Indian eating routine, poor absorption of iron because of snare worm's pervasion, and blood misfortune during conveyance and hefty feminine blood loss. [4-6] Iron deficiency and anemia during the antenatal period are associated with low birth weight babies, premature birth, and increased perinatal and neonatal mortality. Anemia increases the risk of maternal morbidity and mortality and adverse maternal outcomes such as antepartum hemorrhage, postpartum hemorrhage, and puerperal sepsis. [15]

Iron deficiency is responsible for about 95% of anemia during pregnancy, reflecting the increased demand for iron. During the first half of pregnancy, an iron requirement may not increase significantly, and an iron intake of 10–15 mg/day from food is sufficient to cover the basal loss of 1 mg/day. However, in the second half of pregnancy, iron requirements increase owing to an expansion of red blood cell mass and rapid growth of the fetus. An increased number of red blood cells and a higher hemoglobin mass require about 500 mg iron. The iron requirement of the fetus on average is 300 mg. Thus, the total amount of iron necessary throughout a normal pregnancy is approximately 800 mg. This cannot be supplied in the diet, and iron supplementation is a must. [16]

Materials and Methods

This was an observational analytical cross-sectional study with a convenience sample conducted at the St. Philomena Hospital, India. The study was conducted for 6 months from October 2016_march 2017. This maternity hospital is expected for the consideration of low, transitional, and high-hazard pregnant ladies of low financial level in labor who have gotten or not pre-birth care in the unit. By and large, 110 grown-up pregnant ladies with sequential age somewhere in the range of 20 and 38 years of age were admitted to gynecology wards. Moms were recently counseled for the consideration of their kids in this examination. Inclusion criteria were: prenatal care card filled appropriately and sufficiently, singleton pregnancy whose fetuses are born alive without congenital malformation, and information on gestational age at birth. Exclusion criteria were: smokers, drug and alcohol users, and those with infectious diseases. The first step after the selection of the topic in the study was to design a data collection form. The patient data collection was used to collect all the details like inpatient number, age, gender, social history, history, laboratory data, diagnosis, and therapeutic management. All inpatients were those diagnosed with and without anemia in pregnancy. When the analysis of prescription was completed, all data entered into the appropriate software and the results were obtained.

Result and Discussion

We randomly selected 110 cases during 6 months and analyzed various parameters of the case sheet-like as laboratory data, demographic information, drug interaction, medical history, medical outcomes, and hospitalizations. Through this study, the majority of patients were listed in the 20-30 years age group (n=65), (59%). In addition, in this study it was found that the percentage of anemic patients was more in the 20-30 years age group (n=30), (27.2%) compared to the <20 years age and >30 years age group.

Out of 110 patients, 50 were anemic and from these 28 were diagnosed as mild anemic, 20 with moderate, and 2 as severe anemic patients. This result was the same as the result that was found by DEREJE LELISSA *et al.* In their result also out of 125 patients, 70 were anemic and among them, 41 (53.2%) were diagnosed with mild anemia and 36 (46.7%) as moderate anemic. [17] (Table 1).

Table 1: Severity of Anaemia according to Mothers Age. (Normal Range >10.9g/Dl)

AGE	MILD (10-10.9G/DL)		MODERAT(7-<10G/DL)		SEVER(<7G/DL)	
	NO	(%)	NO	(%)	NO	(%)
<20YRS	3	2.7%	2	1.8%	0	0%

20-30YRS	15	13.6%	13	11.8%	2	1.8%
>30YRS	10	9.09%	5	4.5%	0	0%
TOTAL	28	25.4%	20	18.1%	2	1.8%

Likewise, a mother who had <3 antenatal visits were significantly more anemic (n=19), (17.3%) in this study. This may be due to a lack of proper ante-natal care during pregnancy. Regular check-ups during pregnancy can detect anemia during pregnancy and other associated diseases. This result was compared with RENO BEDI *et al.* In their study also pregnant women who had <3 ANS visits were more anemic than those who had >3 ANS visits. [18] (Table 2).

Table 2: Association of ANC Variable with Anemia

ANC VARIABLE		ANAEMIC		NONANAMIC		TOTAL	
		N	%	N	%	N	%
AGE OF MOTHERS	**<20YRS**	**5**	**4.5%**	**7**	**6.3%**	**12**	**10.8%**
	20-30YRS	30	27.2%	35	31.8%	68	59%
	>30YRS	15	13.6%	18	16.3%	33	29.9%
ANC VISIT	<3	19	17.2%	17	15.4%	36	32.6%
	>3	31	28.1%	43	39.09%	74	67.3%
MEDICAL ILLNESS	DESEASED	18	16.3%	17	15.4%	35	31.7%
	UNDISEASED	32	29.09%	43	39.09%	75	68.3%
IRON AND FOLIC ACID SUPPLEMENTATION	ADEQUATE	18	16.3%	30	27.2%	48	43.5%
	INADEQUATE	15	13.6%	21	19.09%	36	32.6%
	NOT TAKEN	17	15.4%	9	8.1%	26	23.5%

In this study, the prevalence of anemia was significantly higher among the women who did not take iron and folic acid supplementation during pregnancy (30.1% VS 9.3%). A similar finding was found in a study conducted by RAKESH SHARMA et al. In their study also anemic patients were not taken proper iron supplementation compared to non-anemic patients (27.4% VS 13.6%). The effect of iron and folic acid supplementation is explained by the fact that iron supplementation increases hemoglobin, serum ferritin, mean cell volume, serum iron, and transferrin saturation. Supplementation can reduce the extent of iron depletion in the third trimester. [19]

The result of this study showed that LBW is higher in anemic women (n=19, 25%) compared to non-anemic ones (n=17, 21%). Moreover, the majority of newborns (n=66, 59.9%) were male. This study has been supported by WALI LONE et al., in the study of whom the number of LBW was higher in anemic women compared to non-anemic, and the male newborns were listed more (n=42,24%) than female. [20] (Table 3)

Table 3: Association of Fetal and Newborn Outcomes with Anemia

FATAL OUTCOME		ANAEMIA STATUS					
		ANEMIC		NON-ANAMEIC		TOTAL	
W.T OF	>2.5	31	17.1%	43	35.7%	74	52.9%
FATAL	<2.5	19	25.7%	17	21.4%	36	47.1%
GENDER	MALE	29	26.3%	37	33.6%	66	59.9%
	FEMALE	21	19.09%	23	20.9%	44	40.1%
GRADE	<1	27	24.5%	23	20.9%	50	45.4%
NUMBER	>2	23	20.9%	37	33.6%	60	54.6%

Out of 110 patients, 29 were high-risk, 16 had an abortion, 11 had dead children, 43 had leaked during pregnancy, and 11 had bled. (Table 4)

Table 4: Clinical Outcomes (High Risk, Bleeding)

OUTCOME	ANAEMIC	NONANAEMIC	TOTAL
BLEEDING	5	6	11
LEAKING	20	23	43
DEATH CHILD	5	6	11
ABORTION	7	9	16
HIGH RISK	13	16	29

Out of the drugs used after delivery, the most usual ones were PPI drugs, then antibiotics, analgesics, and supplements. (Table 5).

Table 5: Drugs Used After Delivery

DRUG CLASS	DRUG NAME	NUMBER	TOTAL
ANTI BIOTICS	PIPERACILLIN	5	69
	METRONIDAZOLE	17	
	AUGMENTIN	5	
	CEFALEXINE	23	
	CEFAZOLINE	19	
PPI	RANITIDINE	41	74
	PANTOPRAZOLE	33	
SUPPLEMENT	CALCIUM	25	54
	IRON	29	
ANALGESIC	PARACETAMOL	21	63
	DICLOFENAC	42	
ANTIEMETIC	ONDANSETRON	24	24
HORMON/THYROID	THYRONORM	17	17
OTHERS	NIFEDIPINE/LEVETRIACETAM	19	19

Out of 110 patients, we found 33 drug-drug interactions, from which, 12 were major and 21 were moderate; also, the number of interactions was more in anemic patients compared to non-anemic ones. (Table 6).

Table 6: Drug-Drug Interaction

DRUGS NAME	SEVERITY	EFFECT	ANEMIC	NON-ANEMIC
METRONIDAZOLE/ ONDANSETRON	MAJOR	INCREASED Q-T INTERVAL PROLONGATION, ARRHYTHMIA	7	5
THYRONORM/ CALCIUM	MODERATE	REDUCED CALCIUM ABSORPTION	8	4
ONDANSETRON /TRAMADOL	MODERATE	DECREASED TRAMADOL EFFICACY	3	6

Conclusion

Through this study, the majority of patients were listed in the 20-30 years age group (n=65), (59%). Moreover, in this study, it was found that the percentage of anemic patients was more in the 20-30 years age group (n=30), (27.2%). The present study indicated that from a total of 110 patients included in this study, anemia was confirmed in 50 patients of them. Among these, 28 (25.4%) were diagnosed as mild anemic, 20 (18.1%) as moderate, and 2 (1.8%) as severe anemic patients.

The factors associated with anemia in pregnancy were caste, dietary – habits, education, occupation, socioeconomic status, ANC visit, and iron and folic acid supplementation, whereas residence, religion, number of children, type of family, and inter-pregnancy interval (months) were not associated. These should be improved by providing proper ANC services. More low-birth-weight (LBW) babies were born to anemic mothers. Anemia in pregnancy may be reduced by proper iron and folic acid supplementation which can be improved through providing proper ANC services. Anemia has also a recognizable association with fetal outcome.

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