

A Prospective Study on Impact of Anemia and Iron Supplementation in Pregnancy, Baptist Hospital, Bangalore, India

ZAHRA KHOSHDEL*, SHIBI TOMAS

Doctors of Pharmacy, Department of pharmacy practice, Karnataka College of Pharmacy, Bengaluru, India

Correspondence to Dr. Xshts zkhodhfrl, Email: niloofar.khoshdell99@yahoo.com

ABSTRACT

Aim: A prospective study on Impact of Anemia and Iron Supplementation in Pregnancy, Baptist Hospital, Bangalore, India

Methodology: the prospective observational study was conducted for 6 months from September 2016_Febrry to 2017. All inpatients women who are pregnant and anemic. The patient data collection was used to collect all the details like inpatient number, age, sex, social history, history, laboratory data, diagnosis, therapeutic management. All inpatients diagnosed anemia in pregnancy and pregnant women without anemia. Fulfilling the inclusion criteria will be enrolled into the study and their prescriptions will be analyzed on daily basis. The prescription guidelines, Micromedex, interaction checker, drug interaction database, and Stockley's drug interaction book 8 edition. The drug interaction in prescription was collected and then compare with guidelines. When the analysis of prescription was completed then all data entered into the appropriate software and the results were gained.

Results: The present study was focused to find out the presence of anemia in 110 pregnant women who were admitted to gynecology and OBG wards of BBH (Bangalore Baptist Hospital). Presence study showed that anemia was Confirmed in 50 patients. Of these 28(25.4%) of them diagnosed as mild anemic, 20 (18.1%) Of them with Moderate and 2(1.8%) of them as severe anemic patients. The result of this study showed that LBW is higher in anemic women 19(25%) compared to non-anemic 17(21%).

Conclusion: The present study showed from a total of 110 patients were included in this study, anemia was confirmed in 50 patients. Of these 28(25.4%) of them diagnosed as mild anemic, 20(18.1%) Of them with Moderate and 2(1.8%) of them as severe anemic patients. 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. Has also a recognizable association with fetal outcome.

Keywords: Anemia, Iron, anemia, iron supplementation, pregnancy, low birth weight.

INTRODUCTION

The arrangement of iron supplements to pregnant women is quite possibly the most broadly rehearsed general wellbeing measures, yet shockingly little is thought about the advantages of supplemental iron for the mother or her posterity during fetal or postnatal life. The reason for this article is to inspect distributed data on the impacts of frailty and iron deficiency on pregnancy outcome and to recognize current holes in the information¹.

Around 2 billion individuals, adding up to more than 30% of the total populace are anemic, mostly because of iron deficiency¹. Iron deficiency is the most pervasive and the most dismissed supplement deficiency on the planet, especially among pregnant women and kids, particularly in non-industrial nations². It is additionally essentially common in industrialized nations. Assessments state that all around the world, 56 million pregnant women (41.8% of the aggregate) are influenced with weakness, again generally because of iron deficiency³. In agricultural nations, this extent can be as high as 80% can imagine in South Asia⁴, making pregnant moms defenseless to the expanded danger of mortality and diminished work limit. It might likewise prompt other perinatal intricacies like toxemia, low birth weight, prematurity, and perinatal mortality⁵. It is the least fortunate, generally helpless, and least taught who are excessively influenced by iron deficiency, and it is this gathering that stands to acquire the most by its decrease. Frailty, as characterized by low hemoglobin or hematocrit, is usually used to evaluate the seriousness of iron

deficiency in populaces without high paces of jungle fever. The high physiological prerequisite for iron in pregnancy is hard to meet with most weight control plans. Thusly, pregnant women ought to regularly get iron supplementation, particularly in non-industrial nations. Prenatal iron supplementation isn't mandatory in many industrialized nations and the suggested portion is normally little (30mg ferrous iron every day)⁶. In any case, for agricultural nations, the proposal is an everyday portion of 60mg of iron for pregnant, non-anemic women for a half day and an expanded portion of 120mg of the iron day by day if the length of supplementation is more limited, if iron deficiency prevalence in women of a given nation is high, and if pregnant women are anemic. This supplement ought to incorporate 400µg of folic corrosive or lower portions if this sum isn't accessible⁷.

In India, pallor contributes straightforwardly to 20% of maternal demise and by implication to an additional 20%^{2,3}. The primary driver of Anemia in the agricultural nations in Antenatal women incorporates low dietary admission of iron and folic corrosive, helpless bioavailability of iron and fiber-rich Indian eating regimen, poor Retention of iron because of snare worm's pervasion and blood misfortune during conveyance and weighty feminine blood loss.⁴⁻⁶ Iron deficiency and Anemia during the antenatal period are related to low birth weight children, untimely birth, and increment perinatal and neonatal mortality. Anemia increases the risk of maternal morbidity & mortality and adverse maternal outcome such as antepartum hemorrhage, post-partum hemorrhage & puerperal sepsis⁸.

Iron deficiency is responsible for about 95% anemia during pregnancy, reflecting the increased demand for iron. During the first half of pregnancy, the iron requirement may not increase significantly and 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. 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 800mg. This cannot be supplied in the diet, and iron supplementation is a must. [9] Women experience an assortment of physiological changes during pregnancy. Changes in the blood circulatory framework are especially striking, allowing typical fetal development. Indeed, even in typical pregnant women, the hemoglobin fixation diminishes with weakening as indicated by the increment in the volume of flowing blood. Since iron and folic corrosive in sums important to the embryo are specially shipped to the baby, the mother is probably going to create iron deficiency sickness and folic corrosive deficiency weakness. About 20% of pregnant women endure paleness, and the greater part of the cases are iron deficiency, folic corrosive deficiency, or both¹⁰.

MATERIALS AND METHODS

the prospective observational study was conducted for 6 months from September 2016-February 2017. All inpatients women who are pregnant and anemic. Approval from the Institutional Ethics Committee and permission from the hospital was obtained before starting the study. 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, sex, social history, history, laboratory data, diagnosis, therapeutic management. All inpatients diagnosed anemia in pregnancy and pregnant women without anemia. Fulfilling the inclusion criteria will be enrolled into the study and their prescriptions will be analyzed daily the prescription guidelines, Micromedex, Interaction Checker, Drug Interaction Database, and Stockley's Drug Interaction Book 8 Edition. The drug interaction in prescription was collected and then compare with guidelines. When the analysis of prescription was completed then all data entered into the appropriate software and the results were gained.

RESULTS AND DISCUSSION

Anemia is quite possibly the most regularly experienced clinical issues during pregnancy. In non-industrial nations, it is a reason for genuine worry as, other than numerous other unfavorable consequences for the mother and the embryo it contributes fundamentally high maternal mortality¹¹. According to World Health Organization gauges, up to 56% of all women living in agricultural nations are anemic, hemoglobin level below 11gm/dl in pregnant women constitutes anemia, and hemoglobin below 7gm/dl is severe anemia.

The present study was focused to find out the presence of anemia in 110 pregnant women who were admitted to gynecology and OBG wards of BBH (Bangalore Baptist Hospital) .to know about any correlation between adverse effects on the mother or fetus and serum hemoglobin/iron deficiency. We selected randomly 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 several hospitalizations.

Through this study majority numbers of patients were listed in the 20-30 years age group 65(59%). also, in this study has been found that the percentage of anemic patients was more in the 20-30 years age group 30(27.2%) compared to the <20 years age and >30yeras age group.

This study has been supported by H.K. Cheema et al who in their study number of patients were listed more in 20-30 years age group 170(56.6%). male patients exceeded female, with 119(59.5%). Also, in their study anemic patients were listed more in the 20-30 years age group¹². Also, in this study, we find out non-educated women were having the maximum prevalence of anemia 32(30.9%) as compared to educated. almost similar finding was observed by SWATI PAWAR *et al*, in their result showed the presence of anemia were more in non-educated patients (62.7%).observation of the present study could be explained by the fact that less-educated women have lack of knowledge about nutritious food, inadequate use of health services, lack of awareness regarding anemia and its effect on pregnancy and its outcomes¹⁴ Presence study showed from a total of 110 patients were included in this study, anemia was Confirmed in 50 patients. Of these 28 (25.4%) of them diagnosed as mild anemic, 20 (18.1%) Of them with Moderate, and 2 (1.8%) of them as severe anemic patients. This result was the same as the result that found with Dereje Lelissa et al, in their result also out of 125 patients, 70 of them were anemic and among these cases, 41(53.2%) of them diagnosed with mild anemia, and 36(46.7%) of them as moderate anemic¹¹. Our result also compared with Mushoumi Biswar et al, the study showed that the number of moderate anemias 107(76.9%) was more than mild anemia 21(15.1%)¹⁵ (Table 1)

Likewise, a mother who had <3 antenatal visits were significantly more anemic 19(17.3%) in this study. This may be due to a lack of proper ante-natal care during pregnancy. as 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 have <3 ANS visits were more anemic than those who had >3 ANS visits¹⁶.(Table 2).

The result of this study showed that LBW is higher in anemic women 19(25%) compared to non-anemic 17(21%). Also, the majority number of the male newborn 66(59.9%) were listed more. This study has been supported by Wali Lone et al, who in their study the number of LBW was higher in anemic women compare to non-anemic, and the male newborn was listed more 42(24%) than female²⁰ (Table 3).

Out of the drugs used after delivery, the most drugs used was PPI drugs, then antibiotics, analgesic, and supplements (Table 4).

In this study, we were found that there is some drug-drug interaction between drugs with each other. We find out 33 drug-drug interactions, from these 12 of them were major and 21 of them were moderate, also the number of interactions was more in anemic patients compare to non-anemic. interaction between Metronidazole and Ondansetron was the most major drug-drug interaction, which caused an increased risk of Q-T interval

prolongation, so ECG monitoring is recommended. Table 5. This result was the same as the result founded by STOCKLEY'S drug interaction edited by Karen Baxter, in their study also the concomitant use of Metronidazole and Ondansetron may increase the risk of Q-T interval prolongation and arrhythmia so if coadministration is required, monitoring of ECG may be warranted¹⁸.

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)	
	n	%age	n	%age	n	%age
<20 YRS	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%

Table 2: Association of ANC Variable with anemia

ANC variable		Anaemic		Nonanamic		Total	
		N	%	N	%	N	%
Age of mothers	<20 YRS	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%

Table 3: Association of fetal and newborn outcomes with anemia

Fetal outcome		Anaemia status					
		Anemic		Non-anameic		Total	
		N	%	N	%	N	%
W.t of fetal	>2.5	31	17.1%	43	35.7%	74	52.9%
	<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 number	<1	27	24.5%	23	20.9%	50	45.4%
	>2	23	20.9%	37	33.6%	60	54.6%

Table 4: Drugs used after delivery

Drug class	Drug name	Number	Total
Anti biotics	Piperacillin	5	69
	Metronidazole	17	
	Augmentin	5	
	Cephalexin	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
Hormone/thyroid	Thyronorm	17	17
Others	Nifedipine/levetriacetam	19	19

Table 5: 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	Deacresed tramadol efficacy	3	6

CONCLUSION

Through this study majority numbers of patients were listed in the 20-30 years age group (n=65), (59%). also, in this study has been found that the percentage of anemic patients was more in the 20-30 years age group (n=30), (27.2%).

The present study showed from a total of 110 patients were included in this study, anemia was confirmed in 50 patients. Of these 28 (25.4%) of them diagnosed as mild anemic, 20 (18.1%) Of them with Moderate and 2 (1.8%) of them as severe anemic patients.

In this study, we were found that there is some drug-drug interaction between drugs with each other. We find out 33 drug-drug interactions, from these 12 of them were major and 21 of them were moderate, also the number of interactions was more in anemic patients compare to non-anemic.

Variables related to anemia in pregnancy were Caste, dietary – propensity, Education, Occupation, Socio-monetary status, ANC Visit, Iron and folic acid supplementation while Residence Religion Number of Children Type of family 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 might be diminished by legitimate Iron and folic corrosive supplementation which can be improved through giving appropriate ANC administrations. Has a likewise conspicuous relationship with fetal outcome.

REFERENCES

- World Health Organization. (1992). The prevalence of anemia in women: a tabulation of available information (No. WHO/MCH/MSM/92.2. Unpublished). World Health Organization.
- Peña-Rosas, J. P., & Viteri, F. E. (2009). Effects and safety of preventive oral iron or iron+ folic acid supplementation for women during pregnancy. *Cochrane database of systematic reviews*, (4).
- De Benoist, B., Cogswell, M., Egli, I., & McLean, E. (2008). Worldwide prevalence of anaemia 1993-2005; WHO Global Database of anaemia.
- World Health Organization. *The World Health Report—Conquering Suffering, Enriching Humanity* (1997). Geneva, Switzerland.
- Murphy, J. F., Newcombe, R. G., O'riordan, J., Coles, E. C., & Pearson, J. F. (1986). Relation of haemoglobin levels in first and second trimesters to outcome of pregnancy. *The Lancet*, 327(8488), 992-995.
- Bothwell, T. H. (2000). Iron requirements in pregnancy and strategies to meet them. *The American journal of clinical nutrition*, 72(1), 257S-264S.
- Stoltzfus, R. J., Mullany, L., & Black, R. E. (2004). Iron deficiency anaemia. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors, 1, 163-209.
- Bardisi, S. M. (2015). Evaluation of anemia during pregnancy at Rusaifah primary health care center in Makkah Al Mukarramah, Saudi Arabia. *International Journal of Medical Science and Public Health*, 4(5), 694-700.
- Bekele, A., Tilahun, M., & Mekuria, A. (2016). 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. *Anemia*, 2016.
- Kumari, S., & Priya, J. (2000). Prevalence of anemia risk factors in pregnant women. *Nutrition*, 72(1), 257S-S264.
- Lelissa, D., Yilma, M., Shewalem, W., Abraha, A., Worku, M., Ambachew, H., & Birhaneselassie, M. (2015). Prevalence of anemia among women receiving antenatal care at Boditii Health Center, Southern Ethiopia. *Age*, 15(19), 25.
- Cheema, H. K., Bajwa, B. S., Kaur, K., & Joshi, H. (2016). Prevalence and possible risk factors of anaemia in different trimesters of pregnancy. *International Journal of Contemporary Medical Research*, 3(4), 1194-1197.
- Khan, M. S., Srivastav, A., & Dixit, A. K. (2014). The burden of anaemia amongst antenatal women in the rural population of northern India. *International Journal of Scientific Study*, 1(4), 40-42.
- Pawar, S. Demographic Profile, anemia status and fetal outcome of the pregnant women attending at tertiary care hospital, Bikaner.
- Biswas, M., & Baruah, R. (2014). Maternal anaemia associated with socio-demographic factors among pregnant women of Boko-Bongaon Block Kamrup, Assam. *Indian Journal of Basic and Applied Medical Research*, 3(2), 712-721.
- Bedi, R., Acharya, R., Gupta, R., Pawar, S., & Sharma, R. (2015). Maternal factors of anemia in 3rd trimester of Pregnancy and its association with fetal outcome. *International Multispecialty Journal of Health (IMJH)*, 1(7), 46-53.
- Farah Wali Lone¹, Rahat Najam Qureshi, Maternal anaemia and its impact on perinatal outcome, June 5, 2007
- Baxter, K., & Preston, C. L. (Eds.). (2010). *Stockley's drug interactions* (Vol. 495). London: Pharmaceutical Press.
- Uche-Nwachi, E. O., Odekunle, A., Jacinto, S., Burnett, M., Clapperton, M., David, Y., ... & Singh, R. (2010). Anaemia in pregnancy: associations with parity, abortions and child spacing in primary healthcare clinic attendees in Trinidad and Tobago. *African health sciences*, 10(1), 66.
- Sharma, J. B., & Shankar, M. (2008). Anaemia in pregnancy. *Differential Diagnosis in Obstetrics and Gynaecology: An AZ*, 31, 19.
- Khalafallah, A. A., & Dennis, A. E. (2012). Iron deficiency anaemia in pregnancy and postpartum: pathophysiology and effect of oral versus intravenous iron therapy. *Journal of pregnancy*, 2012.