ORIGINAL ARTICLE

Correlates of anemia in pregnant women

Ranjana Singh[1], Akhil Kumar Singh[2], S C Gupta[3], Hemant Kumar Singh[4]

[1]Professor, [2]Assistant Professor, Department of Dermatology & Venereology, [3]Professor & Head Department of Community Medicine, [4]Associate Professor cum Statistician, Department of Community Medicine, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh

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Corresponding Author

Address for Correspondence: Ranjana Singh, Professor, Department of Community Medicine, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh
E Mail ID: sranjana@rediffmail.com

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Abstract

Background: Anemia during pregnancy is a global public health challenge facing the world today. Prevalence of anemia in pregnancy in all the age groups is higher in India as compared to other developing countries. **Objective:** This study is aimed at determining the magnitude and to explore the socio-demographic and other correlates of anemia among pregnant women. **Methodology**: This descriptive study with cross-sectional design was conducted in a tertiary care hospital. Pregnant who were attending antenatal clinic for a period of one year were comprised the study material. Correlation between variables was analyzed using the chi-square and odd ratio. **Results**: Three hundred and thirty eight pregnant women were registered for the present study, whose age ranged from 16 to 45 years with a mean age of 26.08 years. Majority (81.95%) participants were found to be anemic. It was observed that anemia was more prevalent in pregnant women age groups i.e. 25-29 years and 30+years i.e. 86.67% and 86.21% respectively. Anemia was 82.92% in women were belonging to Hindu and others religion and 82.24% in women having vegetarian diet. Maximum prevalence (83.93%) of anemia was observed in women who were booked for antenatal care in the 3rd trimester of pregnancy. The prevalence of anemia is higher (>85%) in women having parity two or more, but this association was not statistically significant. Very few (6.21%) were found to be severely anemic as compared to women who were moderately anemic (43.19%). Multiple logistic regression analysis of these factors showed that possibility of anemia is less in women who belong to rural area and it is highly significant. Analysis further showed significant association between anemia and type of diet and other factors like women having parity 1 and 4. **Conclusion**: The prevalence of anemia amongst the pregnant participants was very high. The socio-demographic and obstetrics factors were found to be associated with anemia. To prevent anemia is a challenge in antenatal care and it is recommended that studies focusing on the specific etiologic agents are needed to be conducted.

Key Words

Pregnant women; Anemia; Prevalence

Introduction

Anemia is most common nutritional disorder in the world. WHO estimates that one third of world's population (about 2 billion) suffer from anemia .(1,2) Anemia is a global public health problem affecting both developing and developed countries with a major consequences for human health as well as social and economic development. It occurs at all stages of life cycle, in which it is more prevalent in pregnant women and young children. The WHO mentioned that the prevalence of anemia in pregnant women in developed countries is 14% and in developing countries is 51% and it is 65-75% in India. (3) Anemia directly causes 20% of maternal

deaths in India and indirectly accounts for another 20% of maternal deaths. (4) Prevalence of anemia in all age groups is higher in India as compared to the others developing countries. It is still higher in the South East Asian countries (highest in the world) WHO mentioned that even more important is the fact that about half of global deaths among the pregnant mothers in South Asian countries are due to anemia and India contributes to about 80% of it.(5) Women with moderate anemia have decreased working efficiency with higher maternal morbidity rates.(6) They are more prone to infections. Not only this, ante-partum and post-partum hemorrhage and eclampsia are frequently seen with pregnant women with moderate anemia. This maternal anemia is associated with poor intrauterine growth and increased risk of low birth weight. These results in higher chances of sepsis, peri-natal and infant morbidity and mortality rate. Thus anemia, especially anemia in pregnancy is a big concern and needs for special attention.

Aims & Objectives

To determine the prevalence, associated socio-demographic factors and other correlates of anemia in pregnant women.

Material and Methods

This descriptive study with cross-sectional design was conducted in a tertiary care hospital for the period of one year after ethical clearance and approval .The study subjects include 338 pregnant women who were registered for their antenatal check-up, visiting the Saraswathi Institute of Medical Sciences, Hapur . The anemia was recorded as per their Hb level (gm %) and anemia in this study is taken by using the WHO criteria of hemoglobin values of less than11g/dl, Mild anemia (9.0–10.9 g/dl), Moderate anemia (7.0–8.9 g/dl) and Severe anemia (< 7.0 g/dl).(7) Table 1

Information pertaining to different variables like age, religion, residence, type of diet, reproductive attributes e.g. gravida, parity, time of registration etc. was recorded for the purpose of observations of the present study.

All qualitative data was entered in computer and SPSS version 16 was used for statistical analysis. Thus data obtained from pregnant women were analyzed and chi-square test was applied to explore association between dependent variables. We have also performed multiple logistic regression analysis of determinants of anemia with other factors and odd ratios obtained were used as an approximation for relative risk.

Results

Out of total study subjects enrolled in the study, anemia was recorded in 81.95 % of the pregnant women at the1st trimester or the other trimesters of pregnancy

Women in the 20-24 years age group constituted the highest number of anemic cases 101 i.e. followed by 91 in the 25-29 years age groups. The prevalence of anemia was higher in age group 25-29 years (86.67%) and 30+ years (86.21%) as compared to other age groups. However this difference is statistically not significant.

A higher prevalence of anemia was observed among women living in rural area (82.04%) and women who belong to Hindu and others religion (82.92%). A higher number of anemic were non-vegetarian (152) however the prevalence (82.24%) was high in vegetarian participants. Anemia trend among women that were booked for antenatal care in the 3rd trimester of pregnancy was highest (83.93%).The prevalence of anemia was very high in women having parity two or more (>85%) but this association was not statistically significant. The almost similar prevalence of anemia i.e. 80.58 %, 82.32% and 83.33% in Gravida-1, 2-4 and 5+ respectively showing insignificant association. (Table-2)

Regression coefficient of age group-20-24, 25-29 & 30+ years are 0.406, 1.027 & 1.065 and their respective odds ratios were 0.67, 0.36 & 0.35.Assuming age group of 15-19 years as reference category, odds ratios of age group 20-24 years was 0.67, which showed that, in this age group there are[(1-.67)*100=33%] lower anemic as compared to reference category but it is insignificant. Similarly odds ratio of age group 25-29 & 30+ years were 64% and 65%, showing that lower anemic were found in this age group compared to reference category (15-19 age group). It showed that with increase in age of women, the possibility of anemia is less.

In case of residence, the regression coefficient of rural area is 0.056 & odds ratio is 0.946. The women who belong to rural area are [(1-.946)*100=6%]less anemic compared to reference category (urban area).It is highly significant. The regression coefficient of women having non vegetarian diet is 0.115 and respective odd ratio is 0.891 and vegetarian group using as a reference category[(1-.891)*100=11%].It showed that women having non

vegetarian diet are 11% less likely to develop anemia when compared to vegetarian diet and it is significant.

The multiple logistic regression analysis revealed that there was statistically significant association between anemia and women having parity 1 and 4 but insignificant association was observed between anemia and gravida and trimester of pregnancy. (Table 3)

Discussion

Anemia affects almost two-thirds of pregnant women in developing countries and contributes to high maternal morbidity, mortality and low birthweight. The prevalence of anemia observed in this study was very high and was consistent with data observed elsewhere in developing countries. This study is in line to the estimations of WHO on the prevalence of anemic cases in developing countries. Recorded prevalence of anemia in this study i.e. 81.95% is an indication that anemia during pregnancy is a major problem. In pregnancy it is more severe because of increase demand of body, decreased appetite and lack of knowledge, unequal distribution of food and eating last in family with less food in Indian tradition or due to poverty. This is much high when compared with what was obtained in similar studies conducted in different areas eg Oyo state (32.8%) (8), Kano (48.1%) (9), Bangladesh (49%) (10) and in Gilgit (43.17%) (11). This variation could be due to poverty, ignorance, non-availability of and / or failure to avail medical facilities. In an Indian study which was conducted in rural communities in Delhi showed high prevalence (96.5%), which we cannot compare with the present hospital based study, (12) Socio-demographic variables like maternal age, place of residence and other obstetric factors are insignificantly contributing to maternal anemia. It may be due to the fact that women cannot afford to book early for antenatal care, eat healthy food due to false beliefs inculcated in them by their mothers in law or elder person in their families.

Anemia was observed to be least prevalent (71.45 %) in a pregnant women aged 15-19 years. By applying regression analysis, it was found that odds ratio of age group 20-24 & 30+ years were 64% and 65%, which showed that lower anemic were found in this age group as compared to reference category (15-19 age group) but this is insignificant (12). It showed that with increase in age of women, possibility of anemia is less as these women were more likely to be on iron tablets which might have improved their hemoglobin levels during antenatal visits.

A higher prevalence of anemia (86.67%) were recorded in young mothers (25–29 years) conforms to the observations by the others (13,14). Anemia trend among women that were booked for antenatal care in the 3rd trimester of pregnancy is said to be highest (83.93%) than the first and second trimesters. This may have also contributed that the high percentage of anemia recorded at the time of the 1st visit to hospital and that too in their 3rd trimester. Similar finding were observed by others that the prevalence of anemia increased significantly with duration of pregnancy (15). Since the demand for micronutrients is maximum during last trimester, this could be one underlying factor for high prevalence.

The results of present study are similar to the finding of other studies where moderate anemia (43.20%) was found to be more prevalent (16,17) followed by mild anemia(32.54%).The low incidence of severe anemia(6.21%) recorded in this study is similar to the study in south Nigeria (18). But the result of present study was contrary to study of Pakistan (19) where majority of cases had mild anemia (75%) and moderate anemia (14.8%) and severe anemia was only in 0.7%.This may be due to difference in their diet and cultural habits.

In this study significant association between anemia and parity was observed. This finding corroborates to previous reports in Eastern Sudan, Nigeria and Zaire. (18, 20,21)

Religion, gravid and trimester of pregnancy have been associated with maternal anemia, though this association is not statistically significant. Health education and proper utilization of health care is important to reduce the adverse effects of maternal anemia.

Conclusion

The study is intended to provide useful information that would help in identifying likely areas for specific intervention for enhanced reproductive health performance. The findings in this study demonstrate that there is a high prevalence of anemia among pregnant women. It is recommended that health promotion and disease prevention campaigns be organized at places of contact with pregnant women.

Recommendation

During pregnancy, efforts should be made towards early diagnosis and treatment of all anemic women

before delivery. It is not only needed to prevent anemia at hospital levels but also to address the prevailing demographic factors and cultural factors associated with it

Authors Contribution

All authors have contribute equally.

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Tables

TABLE 1 HEMOGLOBIN LEVELS AND GRADES OF ANEMIA IN PREGNANT MOTHERS

Hemoglobin level (gm %)	Grades of anemia	N=338	%
(≥11)	Non- Anemic	61	18.05
(8-<11)	Mildly anemic	110	32.54
(6.5-<8)	Moderately Anemic	146	43.20
(<6.5)	Severely anemic	21	6.21
(<11)	Total Anemic	277	81.95

TABLE 2 SOCIO-DEMOGRAPHIC AND OBSTETRICS CHARACTERISTICS OF ANEMIC AND NON- ANEMIC PREGNANT WOMEN

Characteristics	All pregnant women N=338	Non anemic N=61		Anemic women N=277		Test of significance		
						Chi –square	d.f.	P value
	No.	No.	%	No.	%			

Age (yrs)								
15-19	14	4	28.57	10	71.45	6.329	3	0.097
20-24	132	31	23.48	101	76.52			
25-29	105	14	13.13	91	86.67			
30+	87	12	13.79	75	86.21			
Religion								
Hindu & others	205	35	17.07	170	82.92	0.334	1	0.563
Muslim	133	26	19.54	107	80.45			
Residence								
Urban	132	24	18.18	108	81.81	0.003	1	0.959
Rural	206	37	17.96	169	82.04			
Type of Diet								
Vegetarian	152	27	17.76	125	82.24	0.015	1	0.902
Non-Vegetarian	186	34	18.28	152	81.72			
Parity								
0	108	22	20.37	86	79.63	3.538	4	0.472
1	73	17	23.29	56	76.71			
2	61	8	13.11	53	86.89			
3	49	7	14.29	42	85.71			
4+	47	7	14.89	40	85.11			
Gravida						0.813	2	0.846
G 1	103	20	19.42	83	80.58			
G 2-4	181	32	17.68	149	82.32			
G 5+	54	9	16.67	45	83.33			
Trimesters								
1st	121	24	19.83	97	80.17	0.637	2	0.706
2nd	49	9	18.37	40	81.63	2nd		
3rd	168	27	16.07	141	83.93	3rd		

TABLE 3 REGRESSION ANALYSIS OF FACTORS AFFECTING ANEMIA AMONG PREGNANT WOMEN

Factors	Variables	Regression Coefficient	S.E.	Wald	Odds Ratio
Age	15-19	-	-	-	1
	20-24	0.406	0.674	0.363	0.666
	25-29	1.027	0.72	2.032	0.358
	30+	1.065	0.765	1.94	0.345
Residence	Urban	-	-	-	1
	Rural	0.056*	0.302	0.034	0.946
Religion	Hindu & Other	-	-	-	1
	Muslim	0.286	0.396	0.521	1.331
Type of Diet	Vegetarian	-	-	-	1
	Non-Vegetarian	0.115**	0.392	0.086	0.891
Parity	0	-	-	-	1
	1	0.382**	0.99	0.149	0.682
	2	0.933	1.028	0.823	0.393
	3	0.814	1.088	0.56	0.443
	4+	1.764**	1.408	1.569	0.171
Gravida	1	-	-	-	1
	2-4,	0.769	0.973	0.625	2.16
	5+	1.903	1.341	2.014	6.7
Trimester	1st	-	-	-	1
	2nd	0.472	0.443	1.132	1.603
	3rd	0.127	0.346	0.135	1.136