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Original Research Article

PREVALENCE OF ANAEMIA DURING PREGNANCY IN NASHIK DISTRICT, INDIA

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ABSTRACT

The present study was designed to estimate the prevalence of anaemia during pregnancy in women of SMBT Institute of Medical science and research center, Nandi hills, Dhamangaon, Ghoti taluka, Nashik dist., and its association with socio-economic status of patients. Blood samples of 100 randomly selected pregnant women of age group (20-40) years were analysed. The overall prevalence rate of anaemia was 75%. Anaemia was found to be prevalent in third trimester (89.3%) as compared to the second (8%) and first (27%) trimester of pregnancy. Out of the 75 anaemic patients, the socio-economic factors (age, monthly income) showed non-significant correlation between anaemic and non-anaemic pregnant women. Present investigation revealed high prevalence of anaemia and the majority of them were of the moderate (hemoglobin: 8.1 -9.9 g/dl) type (33%). The need of the day is to educate people especially pregnant women about their health by launching special health promotional programs and supplementation programs.

KEY WORDS: Anaemia, Iron-deficiency, Nashik district., pregnant Women.

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INTRODUCTION

In 2012, the World Health Assembly Resolution 65.6 endorsed Comprehensive implementation plan on maternal, infant and young child nutrition, which specified six global nutrition targets for 2025 [1]. As per the WHO estimation among the South Asian countries, India has the highest prevalence of anaemia. It is an Asian countries and India contributes to about 80% of the maternal deaths due to anaemia in South Asia [2].

Anaemia is a condition in which there is decline in the circulating red blood cell mass, which reduces the capacity to carry oxygen to the vital organs of the mother and fetus [3]. During pregnancy and puerperium, anaemia is defined as haemoglobin concentration of less than 10.5 to 11g/dl. According to the standard laid down by WHO, anaemia in pregnancy is present when the haemoglobin concentration in the peripheral blood is 11g/dl or less. During pregnancy plasma volume expands, maximum around 32 weeks, resulting in hemo dilution. For this reason, haemoglobin level below 10g/dl at any time during pregnancy is considered anaemia. Haemoglobin level at or below 9g/dl requires detailed investigation and appropriate treatment. Anaemia is responsible for 20% of maternal deaths in the developing countries [4].

Iron deficiency anaemia is the most common anemia of pregnancy complicating as many as 15%to25% of all pregnancies.

Many women enter into pregnancy with low iron stores preconceptionally [5]. It may be due to diet low in iron, heavy menstrual flow, vigorous weight reduction programmes, closely spaced pregnancies etc [6]. When an inadequate supply of iron is ingested, iron is unavailable for incorporation into the red blood cells resulting in iron deficiency anaemia with decreased haematocrit and hemoglobin levels in the blood.

Anaemia in pregnancy is a condition with effects that may be deleterious to the mother and the foetus. Adverse effects of anaemia during antenatal period are poor weight gain, PIH, placenta praevia, eclampsia, abruption placenta and premature rupture of membranes. Maternal risk during intranatal period include preterm labour, dysfunctional labour, intranatal haemorrhage, shock, anaesthesia risk cardiac failure, etc. The postnatal period can be complicated with postnatal sepsis, sub involution and embolism. Anaemia can also effect the foetal and neonatal outcome adversely in the form of complications like prematurity, low birth weight, poor APGAR score, foetal distress, neonatal distress requiring prolonged resuscitation and neonatal anaemia due to poor reserve [7]. The current study was therefore designed to evaluate the prevalence of anaemia during pregnancy in District Nashik pregnant women. The objectives of this study were intended to provide a basis for measures to improve the health of mothers and children.

MATERIALS AND METHODS

A total 100 pregnant women; 75 Anaemic pregnant women, and 25 non- anaemic pregnant women belongs to 20-40 years' age group, who attended the SMBT Institute of Medical science and research center, Nandi hills, Dhamangaon, Ghoti taluka, Nashik dist., were included in the study. The hospitals were daily visited for blood samples and data collected from July 2017- Jan 2018. The purpose, benefits and risks of the study were properly demonstrated to the voluntary participants before obtaining any information and blood sample collection. All information was collected by interviewing of pregnant women.

All the women were informed that the information will be kept confidential and obtained data will be used only for research purpose. A questionnaire was prepared which included different parameters i.e., socio-demographic characters, age, respondent and husband education and their occupation, income, family members, family type, gravid, parity, abortion, ante partum haemorrhage, menorrhagia, oligomennorhea, gestational week, iron supplements and history of number of diseases (jaundice, malaria, T.B, cardiac disease, uterus fibroids, renal diseases, blood haemorrhoids) and dietary history was recorded. Complete blood count (CBC) of the blood samples collected was conducted. The hemoglobin level also categorized into mild anaemic (10.0-10.9), moderate anaemic (8.1-9.9) and severe anaemic (<8.00). Blood samples were drawn and stored in tubes containing EDTA. CBC was performed on all samples by using CBC hematology analyser SYSMEX KX-21. Blood test results and data obtained with the help of questionnaire specially designed for this purpose, were analysed using software program SPSS. Frequencies and percentages were calculated and chi-square test was performed to investigate the significance in the association of the different variables. Correlations were considered significant if $P<0.05$.

RESULTS

Table 1: Frequency of anaemic and non-anaemic patients in different age groups.

Age group (years)	Anaemic (n=75)	Non-anaemic (n=25)
20-30	60 (80%)	24 (96%)
31-40	15 (20%)	1 (4%)

Table 2: Distribution of patients on the basis of CBC parameters.

Variable	Range of variable	No. of patients n=100	Mean ± SD (Range)
MCV	Low (<76 fl)	32	72.12±3.50 (62-76)
	Normal (76-96 fl)	68	83.16±5.03 (76.10-96.00)
	High (>76.96 fl)	Nil	Nil
MCHC	Low (<30%)	23	27.68±2.39 (20.70-29.90)
	Normal (30-35%)	66	32.47±1.28 (30.10-35.00)
	High (>35%)	11	35.75±0.50 (35.10-36.50)
MCH	Low (<20Pg)	9	18.29±1.76 (14.50-20.00)
	Normal (20-32Pg)	90	25.95±2.98 (20.20-31.50)
	High (>32Pg)	1	32.60±.00 (32.60-32.60)
HCT	Low (<40%)	97	30.22±4.54 (16.40-40.00)
	Normal (40-54%)	3	41.23±0.81 (40.30-41.80)
	High (>40-54%)	Nil	Nil
WBC	Low (<4/Cu. mmx103)	1	1.60±0.00 (1.60-1.60)
	Normal(4-11/Cu.mm x103)	72	8.14±1.57 (4.30-10.90)
	High (>11/Cu.mm x103)	27	14.55±3.50 (11.10-28.60)
R.B.C	Low (<4.5 Mill/Cu.mm)	91	3.75±0.50 (1.91-4.50)
	Normal (4.5-6.5Mill/Cu.mm)	9	4.85±0.29 (4.55-5.36)
	High (>6.5Mill/Cu.mm)	Nil	Nil

RBC: Red Blood Cell count, Hb: Hemoglobin, HCT: Haematocrit, MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration, WBC: White Blood Cells count.

Table 3: Statistical comparison of anaemic and non-anaemic pregnant women with their socioeconomic status.

Parameters	Type of patients	Mean ± SD	Significance
Hb	Anaemic (n=75)	8.93±1.49	<0.001
	Non -anaemic (n=25)	12.22±0.98	
Age	Anaemic (n=75)	26.23±5.45	>0.05
	Non -anaemic (n=25)	25.60±3.55	
Gravida	Anaemic (n=75)	3.23±2.19	>0.05
	Non -anaemic (n=25)	2.68±1.68	
Parity	Anaemic (n=75)	1.53±1.80	>0.05
	Non -anaemic (n=25)	0.92±1.12	
Monthly income	Anaemic (n=75)	11.43±10.74	>0.05
	Non -anaemic (n=25)	14.66±19.84	

Here P>0.05, <0.01 and <0.001 means non significance, significant and highly significant, respectively.

DISCUSSION

The present study was to evaluate the prevalence of anemia during pregnancy in Nashik dist. Hundred pregnant women during Six months' period from July 2017 to Jan 2018 were selected randomly. The age of the study subjects varied from 20 to 40 years. According to the blood picture, out of those 100, 75 were anaemic and 25 were non-anaemic Table-1. Out of 75 patients, 24% were mild anaemic, 33% were moderately anaemic and 18% were severe anaemic. Anaemic and non-anaemic pregnant females were categorized into two age groups 20-30 years and 31-40 years. Out of 75 anaemic females 60 (80%) were in 1st group and 15 (20%) were in 2nd group. While out of 25 non-anaemic pregnant females 24 (96%) were in 1st group and 1 (4%) in 2nd group. It was seen that the prevalence of anaemia is higher in 20-30 years' age group as compared to 31-40 years' age group. (Table 1). The correction between frequency of anaemia and monthly income was non-significant (P>0.05).

Patients were distributed on the basis of CBC parameters. Out of 100 patients MCV was <76fl in 32 women and it was normal (76-96 fl) in 68. MCHC was <30% in 23 women, it was normal (30-35%) in 66 women and it was >35% in 11 women. MCH was <20Pg in 9 women, it was normal (20-32Pg) in 90 women and it was >32Pg in 1 woman. HCT was <40% in 97 women and it was normal (40-54%) in 3 women. WBC was <4000/Cu.mm in 1 woman, it was normal (4000-11000/Cu.mm) in 72 women and it was >11000/Cu.mm in 27 women. R.B.C was <4.5 Mill/Cu.mm in 91 women and it was normal (4.5-6.5Mill/Cu.mm) in 9 women. (Table 2). During present study, out of 100 studied pregnant women, the No. of anaemic women (75%) were significantly higher (P<0.001) than non-anaemic patient (25%). The other socioeconomic factors showed non-significant correlation between anaemic and non-anaemic pregnant women (Table 3).

Micronutrient Survey was conducted by National Nutrition Monitoring Bureau to estimate the prevalence of anaemia in the country. It estimated that 70% of pregnant women and 40% of adolescent girls in the country were anaemic. Anemia begins in childhood, worsens during adolescence and aggravates during pregnancy [8]. 15% of adult menstruating women require more than 2 mg per day. In pregnancy iron needs exhibit a marked increase during the second and especially the third trimester. Thus two factors are important in prevention of anaemia in pregnancy: pre pregnancy iron reserved upon which to draw and iron supplementation during pregnancy [9]. Maternal consequence of mild anemia in pregnancy involves reduced work capacity and they may go through pregnancy and labour without any adverse consequences. The maternal outcome of moderate anaemia are infections, prolonged recovery from infections, antepartum and postpartum haemorrhage, PIH and sepsis, premature births and low birth weight and increased prenatal mortality [10]. Severe anemia leads to complications like cardiac decompensation, congestive cardiac failure and if untreated results in pulmonary oedema and death. Anaemia directly causes 20% of maternal deaths and indirectly 20% of maternal deaths in India [11].

Our findings are close to the study was conducted to assess the prevalence of anaemia among pregnant women and adolescent girls in 16 districts of India. A two stage random sampling method was used to select 30 clusters. Results showed that 94.9% of pregnant women were anaemic with Hb<11g/dl; 13.1% had severe anemia with Hb<7g/dl. Among adolescent girl's overall prevalence of anemia was 90.1%, the prevalence rate of mild, moderate and severe anemia were 32.1%, 50.9% and 7.1% respectively. The study concluded that when a

woman enters pregnancy with a large iron deficit, it may be too late to address the problem. Therefore, the healthcare system must educate woman in childbearing age and supply them with iron and folic acid supplements [12].

A study was conducted in south India, Tamilnadu state, rural Vellore district to assess the prevalence of anaemia and iron deficiency in three trimesters with 845 pregnant women from two blocks in Vellore district. Haematological measurement of hemoglobin was done. The prevalence of anemia with Hb<11g/dl was 56.6%, 70.2%, and 69.5% respectively among the first, second and third trimester women. The high prevalence of anemia in each trimester in pregnancy indicates the need for iron supplementation as early as possible [13].

A cross sectional study conducted in rural Maharashtra in 2011 to assess the prevalence of anaemia among pregnant women of rural area. 827 pregnant women between the mean age of 22.72+/- 3.25 years were selected from 16 villages. The overall prevalence of anaemia was 92.38%. Among the total 827 pregnant, 39.66% were mildly anaemic, 49.09% were moderately anaemic, and 3.63% were severely anaemic. The study concluded that there is high prevalence of anaemia which was 92.38% and it continues to be a major public health problem in rural area [14].

A descriptive study was conducted in Karnataka state, Raichur in 2010 among 185 pregnant mothers to assess the prevalence of anemia in pregnancy and their knowledge regarding anemia and its complications. The study revealed that mild degree of anemia was seen in 49.18% which was mainly microcytic hypochromic anemia which was 63.24% indicating iron deficiency anemia. The knowledge regarding anemia in pregnancy is very low, which was 6.48%. 93.5% of the mothers lacked knowledge regarding anemia in pregnancy and its complications [15].

A retrospective study was designed to investigate the outcome of pregnancy and delivery in patients with anaemia. 13,204 patients delivered with anaemia in pregnancy. Higher rates of preterm deliveries and low birth weight were found among patients with anemia compared to the non-anaemic women, with value of 10.7% vs 9.0%, and 10.5% vs 9.4% respectively. Higher rates of caesarean sections were found among anaemic women than in non-anaemic women, with values 20.4% vs 10.3%. Study concluded that maternal anemia was independent risk factor for both preterm delivery and low birth weight [16].

During my clinical experience I have seen that most of the pregnant women who are anaemic are subjected to complications like PIH, eclampsia, abruption placenta, preterm labour, instrumental deliveries, caesarean sections, intranatal haemorrhage shock, postnatal sepsis sub involution and embolism which in turn increases the maternal and neonatal morbidity and mortality rates. So I decided to educate the women preconceptionally so that their iron reserves increase by the time of pregnancy and hence reduce complications related to pregnancy and its outcome and in turn reduce the maternal, perinatal and infant mortality and morbidity of the nation.

Anaemia can be prevented by the consumption of balanced diet rich in iron and protein. The foods rich in iron like liver, meat, egg, green leafy vegetables, green peas, beans, whole wheat, green plantain, onion stalks, jiggery, etc have to be served to the mother in the required quantity. Iron utensils should be preferably used for cooking. A daily administration of 200mg of ferrous sulphate containing 60mg elemental iron along with 1 mg of folic acid is an effective prophylactic procedure for the prevention anaemia. Tea should be avoided within 1 hour of taking iron tablet. Citrus fruit juice like orange and lemon juice should be taken after the consumption of iron tablets. Adequate treatment should be instituted as early as possible to eradicate hookworm infestation, dysentery, malaria, bleeding piles, etc Adequate care has to be taken even before a woman is married. To increase the iron stores in the pre pregnancy state and to reduces the risk of anaemia during pregnancy [4].

Anaemia is a preventable cause of maternal and neonatal mortality and morbidity. Indiscrimination of female children and women in the society by providing her with adequate nutrition and education can reduce the burden of anaemia.

Early registration of antenatal women and proper intake of supplemental iron reduces the risk of anaemia in pregnancy and thereby prevents preterm births and low birth weight babies. The present investigation is done at district level with small sample size. Therefore, further studies are needed to have findings representing the whole nation. Furthermore, lab scale studies are urgently required to find the specific causes of anaemia in pregnant women especially in developing countries. The need of the day is to educate people especially pregnant women about their health by launching special health promotional programs and supplementation programs.

CONCLUSION

Anaemia is a preventable cause of maternal and neonatal mortality and morbidity by providing her with adequate nutrition and education can reduce the burden of anaemia, so we can reduce the risk of anaemia in pregnancy and thereby prevents preterm births and low birth weight babies. Furthermore, lab scale studies are urgently required to find the specific causes of anaemia in pregnant women especially in developing countries. The need of the day is to educate people especially pregnant women about their health by launching special health promotional programs and supplementation programs.

REFERENCES

[1]. World Health Organization. Global targets 2025. To improve maternal, infant and young child nutrition (www.who.int/nutrition/topics/nutrition_globaltargets2025/en/, accessed 6 October 2014).

[2]. Ezzati M, Lupus AD, Dogers A, Vander HS, Murray C. Selected major risk factors and global and regional burden of disease. Lancet. 2002;360(26):1347-60.

[3]. Sharon SM, Emily SM, Trula MG. Foundation of Maternal- newborn nursing. 3rd ed.USA: W.B. Saunders; 2002. p.717-9.

[4]. Dutta DC. Textbook of obstetrics. 7th ed. Howrah: New central agency (P) ltd;2011.p.260-75.

[5]. Adele P. Maternal and child health nursing. 5th ed. Philadelphia: Lippincott Williams and Wilkins;2007.p.362-3.

[6]. Elizabeth JD, Bonnie LS, Martha OS. Maternal-Infant Nursing.2nd ed. Missouri: Mosby publication; 1994. p. 616.

[7]. Hallberg L, Rossander L. Iron requirements in menstruating women. Am J Clin Nutr. 1991;54(4):1047-58.

[8]. Bhaskaran P, Balakrishna N, Radhakrishna KV, Krishnaswamy K. Validation of haemoglobin estimation using hemocue. Indian J pediar. 2003;70(20):25-8.

[9]. Scholl TO, Hediger, Fischer ML, Schaerer JW. Anemia vs iron deficiency: Increased risk of preterm delivery in a prospective study. Am J Clin Nutr. 1992;55(15):985-92.

[10]. Prema K, Neela K, Kumari S, Ramalakshmi BA. Anemia and adverse obstetric outcome. Nutr Rep Int. 1981;23(8):637-43.

[11]. Menon MK. Observation on anemia in pregnancy. Proc Nutr Soc India. 1967;2(1):1-11.

[12]. Toteja GS, Singh P, Dhillon BS, Saxena BN. Prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. Food Nutr Bull [serial online]. 2006 Sep [cited 2011 Nov];27(4):311-5. Available from: URL: http://ncbi.nlm.nih.gov/pubmed/17209473.

[13]. Abel R, Rajarathnam J, Gnanashekaran VJ, Jayaram P. Prevalence of anemia and iron deficiency in three trimesters in rural Vellore district, South India. Trop Doct [serial online]. 2001 Apr [cited 2011 Oct];31(2):86-9. Available from: URL: http://www.ncbi.nlm.nih.gov/pubmed/11321280.

[14]. Hanmanta VW. Burden of anemia among the pregnant women in rural area. Healthline [serial online]. 2011 Jan [cited 2011 Aug];2(2):2229-337. Available from: URL: http://www.iapamge.org/QA/8V212.pdf.

[15]. Vijaynath. Prevalence of anemia in pregnancy. Indian Journal of Applied Basic Medical Sciences [serial online]. 2010 Feb [cited 2011 Sep];12B(15):975-90. Available from: URL: http://www.ijor.aspx.target.

[16]. Levy A, Frazer D, Katz M, Mazor M, Sheiner E. Maternal anemia during pregnancy is an independent risk factor for low birth weight and preterm delivery. Eur J Obstet Gynecol Reprod Biol [serial online]. 2005 Mar [cited 2011 Sep];122(2):182-6. Available from: URL: http://www.sciencedirect.com/science/article/pii/S0301211505000758.

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