ORIGINAL RESEARCH ARTICLE

EVALUATION OF ANAEMIA IN PREGNANT WOMEN

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HOW TO CITE THIS ARTICLE:
Sanjivani A Wanjari. "Evaluation of Anaemia in Pregnant Women". Journal of Evidence Based Medicine and Healthcare; Volume 1, Issue 8, October 15, 2014; Page: 1085-1089.

ABSTRACT: BACKGROUND: India is one of the countries with largest prevalence of anaemia. This is despite the NNAPP- National Nutritional Anaemia Prophylaxis Programme under the Ministry of Health and Family Welfare. Anaemia in pregnancy is considered as a major risk factor for adverse maternal and perinatal outcome. The study was done to analyze the severity of anaemia in the study population. **MATERIALS & METHODS:** A one year study covering 2400 anaemic women was done at Daga Hospital Nagpur, which is a maternity hospital receiving a large number of women from lower socio-economic strata of society. Venous blood was collected and auto-analyser was used to determine five erythrocyte parameters including - Haemoglobin, haematocrit, mean corpuscular volume, mean haemoglobin concentration and mean haemoglobin corpuscular concentrations. **RESULTS:** The women were graded as mild, moderate and severe as per the WHO guidelines. Moderate anaemia HB = 7 to 9.9 accounted for the largest percentage of anaemia in our study and it was around 60 %. The mean age of women included in the study was 23.27 years. The most sensitive erythrocyte parameter was MCV which had mean value of 68.41, standard deviation SD: 9.62 and a statistically significant 'p' value of <0.05. Second sensitive parameter was haematocrit, mean: 28.34, SD: 5.25, p <0.05. **CONCLUSION:** Anaemia is an important cause of maternal ill health and poor neonatal outcome. Proper antenatal care, good nutrition and iron supplementation throughout the pregnancy can help achieve the goal of a healthy mother and healthy baby.

KEYWORDS: Anaemia in pregnancy, iron deficiency, haemoglobin, mean corpuscular volume MCV.

INTRODUCTION: Iron-deficiency anaemia is the most common form of malnutrition in the world and is the eighth leading cause of disease in girls and women in developing countries.[1] WHO in their review of nationally representative survey from 1993 to 2005 reported that 42% of pregnant women were anaemic globally and 90% of these belonged to Africa and Asia.[2] India is one of the countries with largest prevalence of anaemia. High prevalence of anaemia in the Indian population is due to various reasons like poverty, poor nutrition, gender bias and early marriage, short interval between pregnancies, prolonged lactation and infections like malaria and hookworm infestation.

Women in India also follow the custom of 'eating last' or eating food that is left over after all other family members have eaten. Also the bioavailability of iron in Indian diet is poor as the diet is predominantly vegetarian and cereal based. This kind of diet contains substances like phytates, tannins and oxalates that inhibit iron absorption. High prevalence of anaemia is despite the NNAPP- National Nutritional Anaemia Prophylaxis Programme under the ministry of Health and Family Welfare which recommends 'folifer' tablets containing 100 mg of elemental iron along with 500 µgm of folic acid to all pregnant and lactating mothers.

In a study of the Indian Council of Medical Research (ICMR) in 1989, prevalence of anaemia in 4181 pregnant rural women of 11 States was estimated and it was demonstrated that 87.6 percent women had haemoglobin HB <10.9 g/dl.[3] Anaemia in pregnancy is considered as a major risk factor for adverse maternal outcome - like increased risk of maternal mortality, PIH, PROM, prolonged labour, PPH and puerperal sepsis and adverse foetal outcome in the form of LBW, preterm birth, IUGR which are leading causes of neonatal deaths.[4]

In our study an effort was done to find out the severity of anaemia in pregnant women. According to World Health Organization (WHO), haemoglobin level below 11 g/dl is labeled as anaemia during pregnancy and anaemia is classified as mild (10.0-10.99 g/dl), moderate (7.0-9.9 g/dl), and severe (<7.0 g/dl).[5] [6] The same criteria were used in our study.

MATERIALS AND METHODS: A study of 2400 anaemic women was done at Daga Hospital Nagpur, which is a maternity hospital receiving a large number of women from lower socio-economic strata of society. The study was done in our unit over a one year period from 1st April 2013 to 31st March 2014. The study was done to analyze the severity of anaemia in pregnant women. The women were graded as mild, moderate and severe anaemia as per the WHO guidelines. Venous HB is more accurate than capillary HB. Hence venous blood was collected and auto-analyzer was used to determine five parameters which included – Haemoglobin HB%, haematocrit HCT, mean corpuscular volume MCV, mean haemoglobin concentration MCH and mean haemoglobin corpuscular concentrations MCHC. Women with haemoglobinopathies such as sickle cell anaemia and thalassemia were excluded from the study.

RESULTS: The prevalence of anaemia is an important health indicator. When it is used with other measurements of iron status like erythrocyte parameters (haematocrit, MCV, MCH & MCHC) and the haemoglobin levels, it can provide information about the severity of iron deficiency. In our study 100% of the women had iron deficiency anaemia. The mean age of women included in the study was 23.27 years. The youngest being 16 years and oldest 39 years. Age wise distribution of women was as follows - Women less than 20 years were 10%, 20 to 25 years were 71% and 26 to 30 years was 16 % and women more than 30 years of age were a mere 3% (TABLE - I).

There were 41% primigravida in our study, 33% of the women were second gravida and gravida 3 to 5 were 26%. There was no grand-multi in our study (TABLE - II). Women with severe anaemia <7 gm% were 14 %. Moderate anaemia accounted for the largest percentage of anaemia in our study and it was around 60 %. Women with mild anaemia were 26% (TABLE - III). When various erythrocyte parameters were analyzed, we found that mean corpuscular volume MCV was the most very sensitive indicator of anaemia.

Change in MCV occurs even before change in haemoglobin has occurred. Hence proper intervention and treatment of anaemia at this stage can prevent a fall in haemoglobin levels. MCV had mean value of 68.41, standard deviation SD: 9.62 and a statistically significant 'p' value of <0.05. Second sensitive parameter was haematocrit, mean: 28.34, SD: 5.25, p <0.05. A fall in haemoglobin levels occurs very late and haemoglobin had mean: 8.78, SD: 1.46, p <0.05 (TABLE – IV).

Statistical analysis was done by using descriptive and inferential statistical using z-test, chi-square test and Pearson's Correlation Coefficient. The software used in the analysis was SPSS 17.0 and Graph Pad Version 5.0 and $p < 0.05$ is considered as level of significance.

DISCUSSION: India became the first developing country to take up a National Nutritional Anaemia Prophylaxis Program (NNAPP) to prevent anaemia among pregnant women. NNAPP was initiated in 1970 during the fourth 5-year health plan with the aim of reducing the prevalence of anaemia to 25%. The Government of India recommends a minimum dose of total 100 mg of elemental iron and 500 µgm of folic acid tablets to be prescribed during pregnancy. However, high prevalence of anaemia among pregnant women persists despite the availability of this effective, low-cost intervention for prevention and treatment.[7]

Lokare et al quoted that the prevalence of mild, moderate, severe anaemia in their study were observed as 24.7%, 54.5%, and 7.9%, respectively.[8] Thus the prevalence of moderate anaemia was high in comparison to the other degrees of anaemia. The same was noted in our study. Women with severe anaemia <7 gm% were 14 %. Moderate anaemia accounted for the largest percentage of anaemia in our study and it was around 60 %. Women with mild anaemia were 26 %.

A study carried out among 7 states by Nutrition Foundation of India had observed the overall prevalence of anaemia as 84% among pregnant women. The study also revealed 1.8 percent women with haemoglobin <5.0 g/dl, 19.3 percent with <8.0g/dl and 9.2 percent with < 7 g/dl haemoglobin level in pregnancy.[9] This was similar to the ICMR 1989 (rural data- 1985-86) having 22.7 percent pregnant women <8 g/dl and 10.4 percent <7.0 g/dl haemoglobin levels.[10] In our study the prevalence of severe anaemia < 7 gm% in the study population was 14%, thus showing no change in severity of anaemia in last 15 years.

According to Lokare et al, majority of the subjects were between ages 20 to 29 years with an average age of 22.7 years. About 2% of all the pregnancies occurred among teenagers and 5% were among women aged 30 years and above.[8] In our study majority of the women 71% in the study were young under 25 years of age and there is a need to improve the health status of these women. 10% were teenage pregnancies and only 3% women were older than 30 years. Haemoglobin is a late marker of anaemia.[11] This was found true in our study as haemoglobin had mean: 8.78, SD: 1.46, $p < 0.05$. MCV was the most very sensitive indicator of anaemia. MCV mean: 68.41, SD: 9.62 and a statistically significant 'p' value of < 0.05.

The Tenth five year plan [12] has suggested a multi-pronged approach to combat anaemia, which needs to be implemented effectively. It includes: Screening for anaemia, treatment of anaemic women, and availability of food fortification (wheat flour with iron and folic acid), milk, sugar and salt with iron to build long term iron stores which remains the key to reduce anaemia. It recommends oral iron and folate treatment for women with HB between 8-11gm%, parenteral iron therapy for HB 5-8 gm% and hospitalization for women with HB <5 gm%. Even cooking in cast iron utensils improves iron content in diet.[13] The tenth plan also recommends improvement in health care delivery systems and health education to the community to promote utilization of available resources.

Unfavourable socio-demographic factors and illiteracy are the major barriers to the efforts for the prevention of anaemia during pregnancy. Therefore antenatal clinics should be equipped to tackle the issue of anaemia in pregnancy with early diagnosis and evidence-based interventions. There is a need to provide dietary counseling and nutritional education and to stress the importance of 100 day course of 'folifer' tablets in antenatal clinics.

CONCLUSION: Anaemia is an important cause of maternal ill-health and poor neonatal outcome. Proper antenatal care, early detection of anaemia, good nutrition and iron supplementation throughout the pregnancy can help achieve the goal of a healthy mother and healthy baby. Supplementation of pregnant women remains the cornerstone policy for reducing anaemia among women of reproductive age and pregnant women. The anaemia control programme needs to be implemented more efficiently and effectively.

REFERENCES:

1. World Bank - World development report: Investing in health. New York: Oxford University Press, 1993.
2. Sanghvi TG, Harvey PW, Wainwright E. Maternal iron & folic acid supplementation programmes: evidence of impact and implementation. Food nutr bull 2010; 31(suppl2):5100-7.
3. ICMR evaluation of the national nutritional anaemia prophylaxis programme. ICMR Task Force Study. New Delhi: Indian Council of Medical Research; 1989.
4. Bhutta ZA, Darmstadt GL, Hasan BS et al. Community based interventions for improving peri-natal health outcomes in developing countries: a review of evidence. Paediatrics 2005; 115(suppl2): 519-617.
5. http://www.who.int/vmnis/indicators/haemoglobin.pdf
6. Toteja GS, Singh P. Micronutrient profile of Indian population. New Delhi: Indian Council of Medical Research; 2004.
7. Agarwal DK, Agarwal KN, Roychaudhary, Targets in national anaemia prophylaxis programme for pregnant women. Indian Paediatric 1988; 25: 319-22.
8. Lokare PO, Karanjekar VD, Gattani PL, Kulkarni AP. A study of prevalence of anaemia and sociodemographic factors associated with anaemia among pregnant women in Aurangabad city, India. Ann Nigerian Med 2012; 6:30-4.
9. K.N. Agarwal, D.K. Agarwal, A. Sharma, K. Sharma, K. Prasad, M.C. et al Prevalence of anaemia in pregnant & lactating women in India. Indian J Med Res 124, August 2006, pp 173-184.
10. ICMR evaluation of the national nutritional anaemia prophylaxis programme. ICMR Task Force Study. New Delhi: Indian Council of Medical Research; 1989.
11. Ajit Virkud. Anaemia in pregnancy, Modern obstetrics 2nd edition 2013; 127.
12. Planning commission. GOI. Tenth five year plan 2002-2007. Sectoral policies and programmes. Nutrition. Government of India New Delhi; 2002.
13. Kapur D, Agarwal KN, Agarwal DK. Nutritional anaemia and its control. Indian J Paediatric 2002; 69: 607-16.

Sl. No	AGE	NUMBER	PERCENTAGE
1	<20YEARS	230	10%
2	20-25YEARS	1714	71%
3	26-30YEARS	394	16%
4	>30YEARS	62	3%

Table 1: Age

Sl. No	AGE	NUMBER	PERCENTAGE
1	G1	986	41%
2	G2	785	33%
3	G3-G5	629	26%

Table 2: Gravidity

Sl. No.	HAEMOGLOBIN	NUMBER	PERCENTAGE
1	<7 GM%	331	14%
2	7 - 9.9 GM%	1428	60%
3	10-10.9GM%	641	26%

Table 3: Haemoglobin as per WHO guidelines

	Mean	Std. Deviation	N	Correlation 'r'	p-value
HCT	28.34	5.25	2400	0.98	0.000 S, p<0.05
MCV	68.41	9.62	2400	0.99	0.000 S, p<0.05
MCH	24.83	3.95	2400	0.92	0.000 S, p<0.05
MCHC	32.79	2.42	2400	0.99	0.000 S, p<0.05
Hb%	8.78	1.46	2400	0.95	0.000 S, p<0.05
Age	23.27	2.89	2400	-	-

Table 4: Correlation of age with other erythrocyte parameters (n=2400)

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Date of Submission: 22/09/2014.
Date of Peer Review: 23/09/2014.
Date of Acceptance: 05/10/2014.
Date of Publishing: 14/10/2014.