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Research Article

A Screening Study on Prevalence of Anemia in Pregnant Women during Different Trimester

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Abstract: Maternal nutrition is very essential determinant influence during the development of foetus. Inadequate intake or absorption of iron in conjunction with blood loss during pregnancy may contribute to anemia. Anemia is the most common nutritional deficiency disorder in the world. The aim of the study was to complete blood count in 2nd and 3rd trimester during pregnancy and find out prevalence of anemia in these subjects. Pregnant women who had hemoglobin (Hb) value of < 11gm were selected. Total 80 anemic pregnant women were enrolled for the study. Out of 80, 28 (35%) belongs to primigravida and 52 (65%) multigravida. Among 80 participants, 54.54% were mild anemic, 43.92% were moderate and 3.54% were severe anemic. Other hematological parameters like RBC (Red blood cell) count, HCT (Hematocrit), MCV (Mean corpuscular volume), MCHC (Mean corpuscular hemoglobin concentration), and MCH (Mean corpuscular hemoglobin) were also below the normal range. There is a need to monitor hemoglobin during pregnancy and there by improve the outcome of pregnancy.
Keywords: Pregnancy, Trimester, Hemoglobin, Prevalence, Anemia, Gravida.

INTRODUCTION

Pregnancy is one of the most and unique periods of women's life cycle. Though it is the most exciting period of expectations and fulfillments, but it is a condition of great stress because many anabolic activities takes place and foetal growth is accomplished extensive changes in maternal body composition and metabolism [1, 2]. Several studies on intra-household food allocation shows that women get less food than men relative to their nutritional needs [3, 4]. Unequal access to food, heavy work demands, nutritional deficiencies including iron, makes Indian women susceptible to illness, and anaemia. Low intake of ascorbic acid and meat, due to low income reduces the absorption of iron [5]. While malnutrition is prevailing among all segments of the population, poor nutrition among women begins in early years and continues during their lifetime. Usually, female members in a family are the last to eat. Consequently, if there is not enough food they are the ones to suffer mainly. Anemia is defined as the most common hematological disorder during pregnancy having decreased hemoglobin level or circulating red blood cells [6]. The World Health Organization (WHO) has estimated that prevalence of anemia in pregnant women was found 14% in developed, 51% in developing countries and 65-75% in India. Prevalence of anemia in all the groups is higher in India as compared to other developing countries. WHO recommends that hemoglobin ideally should be maintained at or above 11.0 g/dl in the second trimester [7]. Anaemia contributes to low birth weight and miscarriages and it is also a primary cause of low immunity of both the mother and the child [8]. Iron absorption during pregnancy is determined by the amount of iron in diet, its bioavailability (meal composition) and the changes in iron absorption that occurs during pregnancy. Although iron requirements are reduced in 1st trimester because of absence of menstruation these raised steadily thereafter as high as > 10 mg/day [9].

MATERIALS AND METHODS

The cross-sectional study was conducted in Dhiraj hospital, Vadodara, India. A total of 80 anemic pregnant women who were attending antenatal hospital, willing to participate were selected randomly for this study. In present study both vegetarian and non-vegetarian pregnant women with age group 18-35 yrs were included. Obesity, diabetes and any complication related to pregnancy were excluded from our study. The written consent of pregnant women was obtained prior to collection of blood sample. Data was collected through general information and standardized questionnaire. Pretested questionnaire was including

education, trimester, Gravida etc. Standardized techniques were used for the biochemical estimations. Venous blood samples were drawn from mothers for the assessment of hematological parameters. EDTA (ethylene diamine tetra acetic acid) tubes were used for blood sample collection. RBC (Red blood cell) count, PCV (Packed cell count), hemoglobin concentration and other parameters were assessed by automated counter. Hematological estimation was done by auto analyzer with including analysis were Hb (Hemoglobin), MCV (Mean corpuscular volume), RBC (Red blood cell), MCHC (Mean corpuscular hemoglobin concentration), MCH (Mean corpuscular hemoglobin), and HCT (Hematocrit). Analysis was done on the same day of blood collection. The reference values for pregnant women used in this study were hemoglobin: 9.9- 13.6 g/dL, RBC: 3.2-4.6 million/$mm^{3,}$ HCT: 30.2- 42.3%, MCV: 78.6-102.2 fL, MCHC: 31.3-35.4%, and MCH: 25.2-34.7 Pg. The following parameters were analyzed by Sysmex KX-21 and their normal range in women as per Sysmex operation manual.

Statistical analysis

Data was analyzed using appropriate statistical tests. Data were analyzed using frequencies and percentages for categorical variables and central tendency and dispersion measures (Standard Deviation [SD]) for quantitative variables. All statistical parameters have done with the help of Microsoft Excel.

RESULTS

In this study out of 80 pregnant women 54.54% were mild anemic, 43.92% were moderate anemic while 3.54% were severe anemic. According to the age group the mean Hb were 9.56 ±1.12, 8.10 ±0.70, and 8.15 ±0.72 in the age group <20, 20-25 and >25 respectively. The mean RBC were 3.78 ±0.43, 3.52 ±0.33 and 3.73 ±0.43 in the above age group. Others hematological parameters were below the normal range in all age groups also in Table 1.

In 3rd trimester hemoglobin and other parameters were below normal range as compared to 2nd trimester during pregnancy in Table 2.

The women who belong to splendid multi gravidae reported hemoglobin and other values much lower as compared to women who belong to primi-gravidae in Table 3.

According to diet consumption, the parameters values of RBC were higher in non vegetarian women than vegetarian women in Fig. 1.

Table 1: Hematological profile of anemic pregnant women according to their age group

Age group	Number	Hb(g/dL)	RBC(10^{-6}/µL)	HCT (%)	MCV(fL)	MCHC (%)	MCH(pg)
< 20	11	9.56 ±1.12	3.78 ±0.43	31.24 ±3.60	79.49±2.99	24.47 ±2.86	27.67±2.80
20-25	50	8.10 ±0.70	3.52 ±0.33	29.43 ±3.46	77.79±2.67	21.17 ±2.58	27.42±3.37
>25	19	8.15 ±0.72	3.73 ±0.43	29.42 ±2.54	78.23±3.43	23.43 ±2.33	28.42 ±2.43

Table 2: Hematological profile of anemic pregnant women according to their trimester

Trimester	Number	Hb(g/dL)	RBC(10^{-6}/µL)	HCT (%)	MCV(fL)	MCHC (%)	MCH (pg)
2nd Trimester	36	8.93±0.91	3.79±0.33	29.71±3.27	76.91±2.52	24.51±2.32	29.32±2.53
3rd Trimester	44	9.12±0.94	3.81±0.35	30.21±4.23	78.24±3.52	24.52±2.32	29.42±3.42

Table 3: Hematological profile of anemic pregnant women according to their gravidae

Gravidae	Number	Hb(g/dL)	RBC(10^{-6}/µL)	HCT(%)	MCV(fL)	MCHC (%)	MCH(pg)
Primi gravidae	28	8.79 ±0.82	3.73 ±0.44	29.42 ±3.43	77.82 ±2.43	23.54 ±3.42	28.30±3.52
Multi gravidae	52	8.17 ±0.74	3.71 ±0.48	28.73 ±2.45	78.93 ±3.43	22.53 ±2.42	28.32±3.53

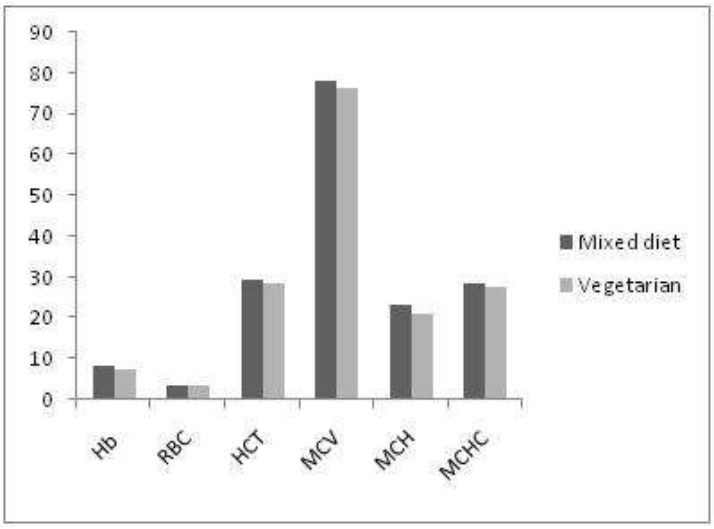

Fig. 2: Represents the degree of anemia in pregnant women according to diet consumption. It shows all RBC parameter values are higher in non vegetarian women than vegetarian women

DISCUSSION

In this study Total Red blood count, Mean cell hemoglobin (MCH) and Mean cell hemoglobin concentration (MCHC), Mean cell volume (MCV) ware low which was comparable to another study. The main cause of anaemia in pregnancy may be due to hemodilution, poor intake of nutrition, increased need of body supplement due to growing fetus, poor absorption, parasitic infestation, faulty food habit like tea consumption before food intake, less vitamin-c intake, poor sanitation, social taboo and psychological. Moreover, they were also exposed to diseases due to the insanitary conditions of the environment; they have to wash utensils and clothing in the polluted pond water which may cause disease and in turn affect the haematological parameter. Thus, cultural factors play an important role in determining haemoglobin status at micro-level, even in high-income households [10]. On the whole, women booked late for ANC (Ante natal care) median booking gestation was 23 weeks constant with other studies, so anaemia was more common, and more rigorous late in pregnancy [11] reflecting a deterioration of the anaemia as pregnancy advances, and in the absence of treatment. In addition, in developing countries, anaemia is common even among non-pregnant women, and anaemia develops rapidly because in most cases iron stores were depleted even before a pregnancy starts [12]. Young and nulliparous women were more severely anemic. This is most likely due to the effect of malaria. Peak malaria parasitemia with resulting anaemia occurs at around twenty weeks in primigravida [13,14]. Severe anaemia also found among adolescent primigravida [15]. In this group, in addition to the effects of malaria, the increased nutritional requirements for the pregnancy were superimposed on the requirements for growth of the adolescent. Data from NNMB surveys showed that iron and folic acid intake in the country in all the age groups were very low. There had not been any increase in iron intake over the last three decades in any group. Poor iron stores at birth [16] low iron content of breast milk and low dietary iron intake through infancy and childhood results in high frequency of anaemia in childhood. Anaemia gets aggravated by increased requirements during adolescence and during pregnancy. Assuming that the absorption of iron is 8 per cent in pregnant women, their average dietary intake will meet only 30-45 per cent of the requirement. Interstate differences in iron intake were of small magnitude. The low dietary intake of iron, folic acid and food stuffs that promote iron absorption, coupled with poor bioavailability of iron were the major factors responsible for very high prevalence of anemia in the country [17, 18]. Anaemia and iron deficiency in the mother were not associated with significant degree of anaemia in the children during neonatal period. Thus maternal iron deficiency and anaemia render the offspring vulnerable for developing iron deficiency and anaemia right from infancy. Poor iron content of complementary food and family food consumed by the young child results in further increase in prevalence of anemia in childhood [19]. With the onset of menstruation and associated blood loss, there is the further rise in prevalence and severity of anemia in adolescent girls [20]. It was noticeable that there is an intergenerational self perpetuating vicious cycle of anemia in Indian population [21, 22]. So, early diagnosis of anemia is necessary. Cure of anemia is one of the great challenges to break vicious cycle of anaemia in Indian population with targeting on ANC mother.

CONCLUSION

Anaemia is a silent destroyer. The high prevalence of anaemia, despite the availability and easy access to medical care, indicates the level of ignorance and indifference to health needs. There is an urgent need to aware pregnant women and their families about the importance of antenatal care. There is a need to supervise these parameters during pregnancy also.

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