Original Article

Anemia in Pregnancy

The Incidence of Anemia in Pregnant Population of Pakistan Belonging to Different Socioeconomic Groups

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ABSTRACT

Objective: To rule out anemia based on conventional method like CBC in pregnant population of Pakistan in three different socioeconomic groups.

Study Design: Prospective/ Comparative / cross sectional study.

Place and Duration of Study: This study was conducted at the Social Security Hospital Manga Raiwind Road, Lahore and Sharif Medical Trust hospital, Lahore for a period of one year during 2010-2011.

Materials and Methods: 60 pregnant females from different socioeconomic groups in late first trimester were included. All included women were followed through all three trimesters of pregnancy and their Hb, MCV, MCHC, HCT, RBC count was estimated. Hematology auto analyzer of social security hospital model XT-2000i was used for analysis.

Results: The incidence of anemia is still high in our pregnant population regardless of their socioeconomic status**.** The mean hemoglobin level, were found lowest in third trimester as compared to first and second trimester of pregnancy in spite of socioeconomic status of females. All the three socioeconomic groups have almost equal %prevalence of anemia.

Conclusion: The prevalence of iron deficiency anemia in all socioeconomic groups of pregnant population is still alarming in our country**.** Measures such as prophylaxis iron treatment and food fortification should be started after the diagnosis even by simple and conventional tests such as hemoglobin and red cell indices.

Key Words: Anemia, Iron deficiency anemia, Pregnant, socioeconomic groups

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INTRODUCTION`

Anemia is very common in developing countries[1,2].Iron deficiency anemia is most prevalent and neglected nutritional deficiency in theses countries.[3]About two third of pregnant population is affected by this disease[4]. Anemia is defined as reduction of hemoglobin from 14-16g% in males and 12-14 g% in females[5]. Low level of hemoglobin results in insufficient oxygenation of peripheral tissues measured by hematocrit, which is defined as proportion of blood sample that is occupied by red cells [6].Anemia is one of the common complications of pregnancy. Iron stores are already low in most of womenat the beginning of pregnancy whilst its requirements are greater although absorption rate of iron after first trimester increases and continues throughout pregnancy [7].

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According to food and nutrition board of national academy of sciences pregnancy increases iron requirement approximately 3.5 mg/day[8]. Iron deficiency anemia is not a disease but manifestation of many diseases so its diagnosis is very important [9]. For the diagnosis of iron deficiency anemia According to Royal College of obstetrician and Gynecologist especially the hemoglobin level should be less then 11gm/dl in first trimester and less than 10.5gm/dl in second and third trimester or MCV falls from 76 fL will be considered as anemic[10]. Diagnosis ofanemia during pregnancy is very important as it is associated with many complications like vasomotor disturbance [11] behavioral changes [12]and decrease immunity[13]. It also associated with increase mortality[14], rate of premature delivery[15], preeclampsia and eclampsia[16]. Iron stores of mother also effect the prevalence of anemia in new born babies.[17]Although very advance and reliable methods like serum ferritin are available for diagnosis of anemia but our most general practioners use red blood cell indices because it is conventional and inexpensive.[18]

MATERIALS AND METHODS

After approval from ethical review board 60 pregnant females of different age, parity and in late first trimester were included from social security hospital Manga

Raiwand Road Lahore and Sharif Medical Trust hospital Lahore. These women were divided in poor, middle and upper class according to monthly income and dietary habits of their family. All included women were followed through all three trimesters of pregnancy and their Hb, MCV,MCHC, HCT, RBC count was estimated. Diagnosis of anemia was made based on CDC (center for disease control and prevention criteria) according to which hemoglobin level was less than 11 gm/dl in first and third trimester and less than 10.5 gm/dl in second trimester [19].Hematology auto analyzer of social security hospital model XT-2000i was used for CBC analysis. History of patient, demographic information and biochemical results were included in Performa.

Exclusion criteria: Patients with diabetes, hypertension, renal failure malignancy or any other serious disease.

In this Cross sectional comparative study 60 pregnant females of different age, parity, socioeconomic groups and in late first trimester were included.

RESULTS

In this study 60 pregnant females of different age, parity, socioeconomic groups and in late first trimester were included. Out of 60 women 3 aborted, 2 went for preterm delivery and 10 women left the study uncompleted. Finally 45 females were followed from first to third trimester. Data was collected and assessed by using analysis of variance (ANOVA) for over all comparison least significant difference (LSD) for pair comparison[20].

Mean Hemoglobin level g/dl and analysis of ANOVA in different socioeconomic groups and in three trimesters were

Table No.1: Mean Hb levels g/dl in different socioeconomic groups and three trimesters of pregnancy

Group	1st Trimester	2nd Trimester	3rd Trimester
Poor	11.9±1.3	10.2±1.4	9.8±1.3
Middle	12.1±0.9	10.5±0.8	10.2±1.0
Upper	12.1±1.1	10.5±1.3	10.6±1.2
Total	12.1±1.1	10.4±1.2	10.1±1.1

Table No.2: Analysis of variance (ANOVA) of Hbg% in different socioeconomic groups and three trimesters of pregnancy

Source	Type III sum of squares	df	Mean square	F	Sig
Trimester	81.5	1	81.5	142.9	*0.0
Intercept	15804.7	1	15804.7	5.1	*0.0
Group	6.316	2	3.15	1.0	NS0.3
Error	130.1	42	3.1		

Table No.3: Mean corpuscular volume (MCV) level (fL)in different socioeconomic groups and three trimesters of pregnancy

Group	1st Trimester	2nd Trimester	3rd Trimester
Poor	81.0±5.5	76.3±5.4	76.4±8.6
Middle	80.2±9.7	79.7±9.4	76.2±8.2
Upper	78.7±4.7	75.7±2.7	75.3±11.5
Total	80.1±7.1	77.4±6.9	76.0±2.7

Table No.4: Analysis of variance(ANOVA) of Mean corpuscular volume (MCV) level (fL)in different socioeconomic groups and three trimesters of pregnancy

Source	Type III sum of squares	df	Mean square	F	Sig
Trimester	365.37	1	365.3	25.0	*0.0
Intercept	797368.6	1	797368.6	6.0	*0.0
Group	107.5	2	53.7	0.47	NS0.73
Error	5553.93	42	132.2		

DISCUSSION

The prevalence of IDA during pregnancy in developing countries like Pakistan make it serious problem due to its relation with child health and maternal mortality rate. The present study was aimed to detect the anemia by conventional method in pregnant population belonging to three different socioeconomic groups. Although many advance and reliable methods are available to screen anemia but they all are expensive .In countries like Pakistan many practioneers still using conventional methods like CBC to diagnose anemia as they are cheap and convenient. In this study total of 60 females of different socioeconomic groups were included and their Hb, MCV and HCT levels were analyzed by hematology auto analyzer through three trimesters of their pregnancy. Total prevalence of anemia was found 65% in total pregnant population. Total incidence of anemia and was 46%, 57% and 75% in first, second and third trimester respectively collectively in three socioeconomic groups. Poor class of pregnant population has highest incidence of anemia at the beginning of study i.e. 56% while the middle and upper class has this incidence 47% and 33% respectively. During second trimester the incidence of anemia almost remain same except for upper class i.e. 75%. During third trimester the incidence of anemia was raised dramatically and is 75% for each class. The mean Hb levels were lowest in poor class. The Hb levels were also found lowest in third trimester in all three socioeconomic groups (Table 1). There were significant changes ($p<0.05$) were observed between Hb levels of all three trimesters and non –significant changes ($p>0.05$) were observed in different socioeconomic groups. The MCV levels were also

towards lowest range in third trimester regardless of socioeconomic grouping.(Table 3 &four). The other red cell indices like MCH, MCHC, and RBC count shows linear positive correlation with hemoglobin.

CONCLUSION

From the present study it is concluded that incidence of anemia is still alarmingly high in our population even with use of in sensitive methods of detection. There is no significant difference between the Hb levels of different socioeconomic groups. The Low levels of Hb even in upper class may be due to lack of knowledge, Malnutrition, over cooking of food, genetic error or worm infestations that should be rule out.

Recommendations: Daily food items of our population like flour (maize or wheat), rice salt, beverage, milk, sugar, should be fortified with iron .This will boost Iron stores and improve hemoglobin level of our population. In developing countries like Pakistan prophylaxis iron supplementation should be given to every iron deficient patient even diagnosed by conventional method.

Author's Contribution:

Concept & Design of Study:	Ghazala Irshad
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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