Iron Deficiency Anemia in pregnant females coming for their 1st antenatal workup - A Cross-Sectional Study

ARAFAT ALI FAROOQUI[1], AQSA IFTIKHAR[2], MUHAMMAD WAQAS[1], *GULNAWAZ CHATHA[2], HALEEMA TAYYAB[3]*
[1]*King Edward Medical University Lahore,*
[2]*Allama Iqbal Medical College Lahore,*
[3]*Lahore General Hospital, Lahore*
Correspondence to Dr. Arafat Ali Farooqui Email: arafatalifarooqui@gmail.com

ABSTRACT

Background: Anemia is defined as reduced levels of circulating hemoglobin (Hb) that is insufficient to meet the oxygen requirements of cells. Anemia in pregnancy is very common. It may be due to dilutional effect but the most common cause of gestational anemia in the developing world is iron deficiency.
Aim: To find out frequency of iron deficiency anemia in pregnant females coming for their 1st antenatal workup.
Place & duration: Lahore General Hospital, Lahore. 04 weeks.
Methods: This is a cross-sectional study.188 pregnant ladies between ages of 18-46 were included in the present study. After taking informed consent; pregnant females fulfilling the established criteria were selected who showed up for their first antenatal workup. Blood samples were taken as part of their regular antenatal workup.
Results: Majority of the patients were found out to be anemic on their 1st antenatal workup. 179(95.2%) patients had their Hb levels <11 g/dl. Out of these; 23(12.2%) patients were mildly anemic, 150(79.7%) patients were moderately anemic and 6(3.19%) patients were severely anemic.167(88.8%) patients had ferritin levels below 20ng/ml while 166(88.2%) patients had their MCV <80 fl. 144(76.5%) fully met the laid down criteria for iron deficiency { 1) Hb levels <11 g/dl, 2) MCV <80 fl, 3) Ferritin value <20ng/ml}. 01 patient was found out to be having thalassemia minor.
Conclusion: This study concluded that most of the expecting mothers were found out to be anemic on their 1st antenatal workup. Iron deficiency was the most common cause found in these patients. It has serious consequences on the health of both mother and the developing baby. It can lead to stunted growth, low birth weight, premature births and increased perinatal mortality. This all can be prevented by replenishing iron stores of mother. Hence it is indispensable to educate women regarding health promotion.
Keywords: Anemia, iron deficiency, pregnancy.

INTRODUCTION

Anemia is defined as the reduced levels of circulating hemoglobin. Hemoglobin carries oxygen in blood and is responsible to carry this essential component to the cells in order to carry out their metabolism. If blood is deficient in normal hemoglobin levels then cells would be unable to carry out their functions to their maximum extent hence leading to multiple signs and symptoms in the affected individuals like weakness, early tiredness etc. Anemia is classified in different ways but the most commonly used is based upon the MCV (mean corpuscular volume) values.

Normal MCV values range between 80-100 fl. Anemia with normal MCV values is normocytic anemia. If MCV values are less than 80fl; it is designated as microcytic anemia. MCV values more than 100 classify as macrocytic anemia. Iron deficiency anemia comes under the umbrella of microcytic anemia.

According to world health organization (WHO); iron deficiency anemia is the most common cause of anemia worldwide[4,8]. There are multiple causes of iron deficiency anemia. Malnutrition and parasitic infestation contribute a major chunk to Pediatric age group iron deficiency anemia [10]. In adult females; menorrhagia and pregnancies contribute mainly to iron deficiency anemia[4,11,12]. Cancer is the main culprit of iron deficiency in old age group. A person is diagnosed as iron deficient if his/her Hb levels

----

are<11g/d[4], MCV <80 and stored iron (ferritin) levels are below a certain range; <20ng/ml[2,3,9] or <12ng/ml[1,2,3,7]. Further studies indicate low serum iron levels, increased transferrin levels and decreased % saturation of transferrin. A large population becomes iron deficient during pregnancy in developing countries [5]. Iron deficiency anemia in pregnancy has some serious effects on the health of both mother and the growing baby. Different studies indicate that if mother is iron deficient then there are increased chances of premature births, low birth weight and perinatal mortality[5,6,7].

Since iron deficiency anemia is a very comprehensive subject so to find out the frequency of iron deficiency anemia in pregnant females coming for their 1st antenatal workup is very much related to our population. This will definitely help us give further suggestions that might play role in alleviating this problem.

The objective of the study was to find out the frequency of iron deficiency anemia in pregnant females coming for their 1st antenatal workup.

MATERIALS & METHODS

A cross-sectional study was conducted in Lahore General Hospital, Lahore to find out the frequency of iron deficiency anemia in pregnant females coming for their 1st antenatal workup presented to a tertiary care hospital. Pregnant females coming for their 1st antenatal workup were included in the study, whereas uncooperative/ uninterested individuals were excluded.

Patients were considered iron deficient when they meet 03 criteria: 1) Hb levels <11 g/dl, 2) MCV <80 fl, 3) Ferritin value <20 ng/ml. Using PASS version 11; test for one sample proportion with 95% CI, 76.5% prevalence of iron deficiency, 5% margin of error, 188 sample size out of approximate 250 population size in a month, calculated power of the test is 86.5% which justifies the sample size.

RESULTS

Table 1: Descriptive Analysis

		Mean±S.d
Age		26.18±5.14
Hb		9.01±1.04
	< 11	179 (95.2%)
	≥ 11	9 (4.8%)
MCV		70.07±8.06
	< 80	166 (88.3%)
	≥ 80	22 (11.7%)
RBC		4.05±0.49
Ferritin level		12.30±17.93
	< 20	167 (88.8%)
	≥ 20	21 (11.2%)

Table 2: Hemoglobin levels of study population

Hb levels (g/dl)	N (%)
≥12	01 (0.5)
11-11.9	08 (4.25)
10.1-10.9 (Mild anemia)	23 (12.2)
7-10 (Moderate anemia)	150 (79.7)
<7 (Severe anemia)	06 (3.19)

Table 3: Iron deficient patients in study population

Patients having	No. of patients	Percentage
1. Hb <11 g/dl 2. MCV <80fl 3. Ferritin <20 ng/ml	144	76.5%
1. Hb ≥11 g/dl 2. MCV ≥80fl 3. Ferritin ≥20 ng/ml	44	23.4%

Out of 188 patients (n=188), mean age was 26.18±5.14. Mean Hb levels were 9.01g/dl with SD of ±1.04. 179(95.2%) had Hb levels<11g/dl while only 9(4.8%) had Hb levels >11g/dl. Out of these; 23(12.2%) patients were mildly anemic (Hb between 10-11g/dl), 150 (79.7%) patients were moderately anemic (Hb levels 7-10 g/dl) and 6(3.19%) patients were severely anemic (Hb levels <7 g/dl). Mean ferritin levels found out to be 12.30 ±17.93. 167 (88.8%) had their ferritin levels below 20ng/ml while 21 (11.2%) had their ferritin levels in normal range. Mean MCV value was found out to be 70.07±8.06 with 166 (88.3%) patients had their MCV values below 80 fL while 22 (11.7%) had MCV values more than 80 fl. Mean RBC volume was found out to be 4.05±0.49. 01 patient was found out to be having thalassemia minor. Out of the total 188 patients; 144 (76.5%) fully met the laid down criteria for iron deficiency {1) Hb levels <11 g/dl, 2) MCV <80 fl, 3) Ferritin value <20 ng/ml}.

CONCLUSION

Most of the females coming for their first ever antenatal workup to a tertiary care hospital in Lahore Pakistan were found out to be anemic. Complete blood counts showed low hemoglobin and MCV levels. Further studies revealed depleted iron stores in the form of decreased ferritin levels. Majority of the females were unsure of their last menstrual periods. Some even presented in their last trimesters for their 1st antenatal workup. Majority of the females were uneducated. Majority of the females did not know the symptoms and consequences of anemia hence leading to late presentation to the hospital. If females were counseled regarding signs and symptoms of anemia; majority of these cases can be prevented which could result in decreased number of premature births, newborns with low birth weights and perinatal mortality.

DISCUSSION

The present study concluded that most of the females coming for their first antenatal workup were anemic. Iron deficiency anemia was found out to be the major culprit behind the anemia which is in accordance with the findings of world health organization[8]. Majority of the females were unaware of the signs and symptoms of anemia. Hence the consequences of iron deficiency anemia were unknown to them as well which is in accordance with the study of Seshadri et al[10]. Study strongly suggests that there should be health awareness programs for all the females especially of child bearing age so that maternal and child health may not suffer.

REFERENCES

1. Alper BS, Kimber R, Reddy AK. Using ferritin levels to determine iron-deficiency anemia in pregnancy. Journal of Family Practice. 2000 Sep 1;49(9):829-.
2. Harvey T, Zkik A, Auges M, Clavel T. Assessment of iron deficiency and anemia in pregnant women: an observational French study. Women's Health. 2016 Jan;12(1):95-102.
3. Morasso CM, Molero J, Vinocur P, Acosta L, Paccussi N, Raselli S, Falivene G, Viteri FE. Iron deficiency and anemia in pregnant women from Chaco, Argentina. Archivos latinoamericanos de nutricion. 2002 Dec;52(4):336-43.
4. Baig-Ansari N, Badruddin SH, Karmaliani R, Harris H, Jehan I, Pasha O, Moss N, McClure EM, Goldenberg RL. Anemia prevalence and risk factors for pregnant women in an urban area of Pakistan. Food and nutrition bulletin. 2008 Jun;29(2):132-9.
5. Allen LH. Anemia and iron deficiency: effects on pregnancy outcome–. The American journal of clinical nutrition. 2000 May 1;71(5):1280S-4S.
6. Scholl TO, Hediger ML. Anemia and iron-deficiency anemia: compilation of data on pregnancy outcome. The American journal of clinical nutrition. 1994 Feb 1;59(2):492S-501S.
7. Scholl TO, Hediger ML, Fischer RL, Shearer JW. Anemia vs iron deficiency: increased risk of preterm delivery in a prospective study. The American journal of clinical nutrition. 1992 May 1;55(5):985-8.
8. World Health Organization. *Anaemia*. Available at: https://www.who.int/topics/anaemia/en/[Accessed 29 Dec. 2018].
9. Mayoclinic.org. (2018). *Ferritin test - Mayo Clinic*. [online] Available at: https://www.mayoclinic.org/tests-procedures/ferritin-test/about/pac-20384928 [Accessed 29 Dec. 2018].
10. Seshadri S. Prevalence of micronutrient deficiency particularly of iron, zinc and folic acid in pregnant women in South East Asia. Br J Nutr. 2001;85(suppl 2):S87–92
11. van den Broek N. Anaemia in pregnancy in developing countries. Br J Obstet Gynaecol. 1998;105:385–90.
12. Gopalan C. Current food and nutrition situation in south Asian and south-east Asian countries. Biomed Environ Sci. 1996; 9: 102–16.