

IRON DEFICIENCY ANEMIA BY SERUM FERRITIN LEVELS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Iron deficiency anemia (IDA) during pregnancy is a common nutritional disorder with adverse effects for the baby, such as premature birth and low birth weight, and the mother, such as cardiovascular symptoms and reduced physical and mental strength. **Objective;** To determine the frequency of iron deficiency anemia by serum ferritin levels at a tertiary care hospital. **Material and Methods;** All the patients who meet inclusion criteria of this study were registered from Department of Gynecology and Obstetrics, Nishtar Hospital Multan. Proper permission was taken from Institutional Ethical Committee to conduct this study. Examination was done including general physical examination. Venous blood sample (3 ml) was taken and sent to the Pathology Laboratory of the Hospital for serum ferritin levels estimation to diagnose iron deficiency anemia. Data was entered and analyzed by SPSS version 20. **Results;** Our study comprised of a total of 382 patients meeting inclusion criteria of our study. Mean gestational age of our study cases was 29.21 ± 7.16 weeks and 198 (51.8 %) had gestational age up to 30 weeks. Mean age of our study cases was 26.77 ± 4.29 years (with minimum age of our study cases was 20 years while maximum age was 36 years). Our study results have indicated that majority of our study cases i.e. 298 (78.0 %) were aged up to 30 years. Of these 382 study cases, 156 (40.8 %) belonged to rural areas and 226 (59.2 %) belonged to urban areas. Monthly family income up to Rs. 25000 was noted in 213 (55.8%) while more than Rs. 25000 was noted in 169 (44.2%). Of these 382 study cases, 241 (63.1%) were illiterate and 141 (36.9%) were literate. Mean duration of marriage was 5.17 ± 2.41 years and 199 (52.1%) had duration of marriage more than 5 years. Mean body mass index of our study cases was 25.82 ± 2.44 kg/m² and obesity was present in 56 (14.7 %) of our study cases. Mean serum Ferritin level was 11.43 ± 3.98 mg/dl and iron deficiency anemia was noted in 213 (55.8%) of our study cases. **Conclusion;** Very high frequency of iron deficiency anemia was noted in our study among pregnant women. Iron Deficiency anemia was significantly associated with gestational age, age, residential status, low family income and duration of marriage. All the clinicians should screen these pregnant ladies for serum ferritin levels at the start of pregnancy and should counsel them for better awareness which will lead to proper management of iron deficiency anemia.

Keywords; Iron Deficiency anemia, Pregnancy, Ferritin level.

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INTRODUCTION:

Anemia in pregnancy is a major public health problem, especially in developing countries^{1,2}. Different studies have shown different prevalence of anemia during pregnancy ranging from 16.6–95.0%³⁻⁶. Anemia in pregnant women has severe consequences on health, social, and economic development. Anemic pregnant women was at risk of low physical activity, increased maternal morbidity and mortality, especially those with severe anemia. In addition, both pregnant women and their neonates encounter negative consequence including fetal anemia, low birth weight (LBW), preterm delivery, intrauterine growth restriction and perinatal Mortality^{7,8}.

In most of the cases, anemia is largely preventable and easily treatable if detected in time. Effective management of anemia includes treatment of the underlying causes, restoration of the hemoglobin concentration to normal levels, and prevention and treatment of complications. Despite this fact, anemia still continues to be a common cause of mortality and morbidity among pregnant women, and data on relative contributions of associated factors are limited which makes it difficult to effectively address the problem. Besides, different studies indicate significant variations in prevalence of anemia both within and between countries which indicates a need for local data to help the preventive program^{9,10}. Reasons for anemia in pregnancy are mainly nutritional deficiencies, parasitic and bacterial diseases, and inborn red blood cell disorders such as thalassemias. The main cause of anemia in obstetrics is iron deficiency, which has a worldwide prevalence between estimated 20%-80% and consists of a primarily female population. Stages of iron deficiency are depletion of iron stores, iron-deficient erythropoiesis

without anemia, and iron deficiency anemia, the most pronounced form of iron deficiency. Pregnancy anemia can be aggravated by various conditions such as uterine or placental bleedings, gastrointestinal bleedings, and peripartum blood loss. In addition to the general consequences of anemia, there are specific risks during pregnancy for the mother and the fetus such as intrauterine growth retardation, prematurity, feto-placental miss ratio, and higher risk for peripartum blood transfusion. Besides the importance of prophylaxis of iron deficiency, the main therapy options for the treatment of pregnancy anemia are oral iron and intravenous iron preparations¹¹. Alper et al¹² reported 54 % iron deficiency anemia by serum ferritin levels in USA. A local study conducted at Abbottabad¹³ has reported 11.81 ± 4.11 mg/dl serum ferritin level in pregnant women at their 3rd trimester which was significantly lower than that compared with those of control subjects ($p < 0.001$).

MATERIALS AND METHODS

Pregnant women ($n=382$) with gestational age > 12 weeks aged 20 – 40 years both Primigravida and multigravida were included in our study. Patients having with disorders like coagulopathy or hemophilia and bleeding from GIT, Multiple pregnancies, taking iron supplementation and Hypertensive pregnant ladies were excluded from our study. All the patients who meet inclusion criteria of this study were registered from Department of Gynecology and Obstetrics, Nishtar Hospital Multan. Proper permission was taken from Institutional Ethical Committee to conduct this study. Examination was done including general physical examination. Venous blood sample (3 ml) was taken and sent to the Pathology Laboratory of the Hospital for serum ferritin levels estimation to diagnose iron deficiency anemia. Data was entered and analyzed by SPSS version 20. Descriptive statistics was applied to calculate Mean and standard deviation for age, gestational age, duration of marriage and serum ferritin levels. Frequencies and percentages were calculated for outcome variables like iron deficiency anemia, literacy, residential status, age groups and monthly family income.

RESULTS;

Our study comprised of a total of 382 patients meeting inclusion criteria of our study. Mean gestational age of our study cases was 29.21 ± 7.16 weeks and 198 (51.8 %) had gestational age up to 30 weeks. Mean age of our study cases was 26.77 ± 4.29 years (with minimum age of our study cases was 20 years while maximum age was 36 years). Our study results have indicated that majority of our study cases i.e. 298 (78.0 %) were aged up to 30 years. Of these 382 study cases, 156 (40.8 %) belonged to rural areas and 226 (59.2 %) belonged to urban areas. Monthly family income up to Rs. 25000 was noted in 213 (55.8%) while more than Rs. 25000 was noted in 169 (44.2%). Of these 382 study cases, 241 (63.1%) were illiterate and 141 (36.9%) were literate. Mean duration of marriage was 5.17 ± 2.41 years and 199 (52.1%) had duration of marriage more than 5 years. Mean body mass index of our study cases was 25.82 ± 2.44 kg/m² and obesity was present in 56 (14.7 %) of our study cases. Mean serum Ferritin level was 11.43 ± 3.98 mg/dl and iron deficiency anemia was noted in 213 (55.8%) of our study cases.

DISCUSSION;

Nutritional iron deficiency is the most common deficiency disorder in the world, affecting more than two billion people worldwide, with pregnant women at particular risk¹⁴. Our study comprised of a total of 382 patients meeting inclusion criteria of our study. Mean gestational age of our study cases was 29.21 ± 7.16 weeks and 198 (51.8 %) had gestational age up to 30 weeks. A study conducted by Shams et al¹⁵ from Mardan has reported similar results. A study conducted in Thailand by Sukrat et al¹⁶ has also reported similar results. Mean age of our study cases was 26.77 ± 4.29 years (with minimum age of our study cases was 20 years while maximum age was 36 years). Our study results have indicated that majority of our study cases i.e. 298 (78.0 %) were aged up to 30 years. A study conducted by Shams et al¹⁵ from Mardan has reported similar results. A study conducted in Thailand by Sukrat et al¹⁶ has also reported 26.8 ± 6.5 years mean age of the pregnant women which is close to our study results. A study conducted by Abu Salem et al¹⁷ from Egypt has also reported 29.46 ± 5.4 years mean age which is close to our study results. A study conducted in Brazil by de Camargo et al¹⁸ has reported 47 % pregnant ladies less than 25 years old which is similar to that of our study results.

Of these 382 study cases, 156 (40.8 %) belonged to rural areas and 226 (59.2 %) belonged to urban areas. A study conducted by Shams et al¹⁵ from Mardan has reported 70 % rural pregnant ladies which is different from our findings, the reason for this difference is due to the fact that Shams et al¹⁵ conducted this study in Mardan, KPK

which is attached to many adjacent rural areas. Monthly family income up to Rs. 25000 was noted in 213 (55.8%) while more than Rs. 25000 was noted in 169 (44.2%). A study conducted by Shams et al¹⁵ from Mardan has reported 40 % pregnant ladies belonging to poor families which is in compliance with our study results. A study conducted in Thailand by Sukrat et al¹⁶ has also reported similar results. A study conducted by Abu Salem et al¹⁷ from Egypt has also reported 68 % pregnant women from poor families which is in compliance with our study results.

Of these 382 study cases, 241 (63.1%) were illiterate and 141 (36.9%) were literate. Mean duration of marriage was 5.17 ± 2.41 years and 199 (52.1%) had duration of marriage more than 5 years. A study conducted by Shams et al¹⁵ from Mardan has reported 65 % pregnant ladies were illiterate which is close to our study results. A study conducted in Thailand by Sukrat et al¹⁶ has reported very low illiteracy rate which points towards lower literacy rates particularly among females in our society. A study conducted by Abu Salem et al¹⁷ from Egypt has also reported 66 % illiteracy which is similar to that of our study results. Mean body mass index of our study cases was 25.82 ± 2.44 kg/m² and obesity was present in 56 (14.7 %) of our study cases. Mean serum Ferritin level was 11.43 ± 3.98 mg/dl and iron deficiency anemia was noted in 213 (55.8%) of our study cases. A study conducted by Shams et al¹⁵ from Mardan has reported 76.7 % iron deficiency anemia in pregnant women which is similar to our findings. A study conducted in Thailand by Sukrat et al¹⁶ reported only 6 % iron deficiency anemia which is quite lower than that being reported in our study. A study conducted by Abu Salem et al¹⁷ from Egypt has also reported 52.5 % iron deficiency anemia in pregnant women which is close to our study results. A study conducted in Brazil by de Camargo et al¹⁸ has reported 39 % iron deficiency anemia which is similar to that of our study results. A study conducted by Raut et al¹⁹ in Nepal has reported 70 % pregnant ladies had lower serum ferritin levels which is in compliance with our study results.

CONCLUSION

Very high frequency of iron deficiency anemia was noted in our study among pregnant women. Iron Deficiency anemia was significantly associated with gestational age, age, residential status, low family income and duration of marriage. All the clinicians should screen these pregnant ladies for serum ferritin levels at the start of pregnancy and should counsel them for better awareness which will lead to proper management of iron deficiency anemia.

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