"Tracking the Severity of Anemia in Pregnancy: A 100 Case Prospective Study"

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Abstract: *Low hemoglobin level in pregnancy is a most important health problem with unpleasant maternal and fetal outcome worldwide, particularly in developing countries like India. Though pregnancy, 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 fetal growth is accomplished extensive changes in maternal body composition and metabolism. Hematological findings are the primary and cheapest method for diagnosing the mild, moderate and severe anemia during pregnancy.* **Objectives:** *The objective of our study was tracking the severity of anemia in pregnancy: A 100 case prospective study.* **Material and Methods:** *This descriptive study ("Tracking the severity of anemia in pregnancy: A 100 case prospective study"), was carried out on 100 pregnant women, during January 2018 to April 2018, at ANC at NIMS&R Hospital, Shobha Nagar, NIMS University, Jaipur (Rajasthan) after obtaining human ethical approval. CBC (cell counter) was done and degree of anemia was measured as mild (10.0-10.9 gm/dl), moderate (7.0 to 9.9 gm/dl) and severe (5.0-6.9 gm/dl). The data was compiled, tabulated, analyzed with percentages.* **Results:** *42 (42%) pregnant women have normal hemoglobin, which of them 08 (19%), 20 (47%) and 14 (33%) women are belongs with 1st, 2nd and 3rd trimesters correspondingly. 13 (13%) women suffered with mild anemic, which of them 02 (15%), 05 (38%) and 06 (46%) women are belongs with 1st, 2nd 3rd correspondingly, whereas 37 (37%) and 8 (8%) suffered with moderate and severe anemia, in which 15 (40%), 13 (35%), 09 (24%) and 01 (12%), 04 (50%), 03 (38%) women belongs with 1st, 2nd and 3rd trimester correspondingly.* **Conclusion:** *Anemia is related with high rate of morbidity and mortality, and the most commonly reasons are poverty and social deprivation. It is highly recommended that more efficient guidelines regarding educating girl child, spreading effective awareness regarding balanced diet, regular antenatal health-check for safe motherhood.* **Key Words:** *Pregnancy, Anemia, Trimester, Severity, Hemoglobin.*

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I. Introduction

Anemia is defined as decreased hemoglobin level and or circulating red cells mass and the most common hematological disorder during pregnancy through-out the world, particularly in developing countries. World Health Organization has estimated the prevalence of anemia in pregnant women is 14% in the developed countries, 51% in developing countries and 65-75% in India[1].

Anemia in pregnancy is not only associated with adverse maternal outcomes like Puerperal Sepsis, Ante partum hemorrhage, post partum hemorrhage, maternal deaths4 but also adverse fetal outcomes like increased incidents of premature births, low birth weight babies and high perinatal mortality.[2] Though pregnancy, 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 fetal growth is accomplished extensive changes in maternal body composition and metabolism.[3,4,5] The prevalence of anemia is high because of (i) low dietary intake, poor iron (<20 mg/day) and folic acid (<70ug/day) (ii) poor bioavailability of iron (3-4%) in phytate and fibre-rich Indian diet and (iii) chronic blood loss due to infections such as malaria or hookworm infestations.[6]

Pregnancy has three trimesters, each of which is marked by specific fetal development.[7] Pregnancy has three trimesters, the first 12 weeks of pregnancy are considered to make up the first trimester. Weeks 13-28 of the pregnancy are the second trimester; it is often called the "golden period" because many of the unpleasant effects of early pregnancy such as nausea and fatigue disappear. In the third trimester (29-40 weeks) of pregnancy, the fetus grows rapidly and his or her movements become stronger and more frequent.[5]

Maternal consequences of anemia:
• **Mild anemia:** women with mild anemia have decreased work capacity.

- **Moderate anemia:** women with moderate anemia have substantial reduction in work capacity and more susceptible to infections and recovery from infections may be prolonged. Premature births are more common in these conditions.
- **Severe anemia:** in severe anemia cardiac decomposition usually occurs when the hemoglobin fall < 5.0 gm/dl. The cardiac output is raised even at rest, the stroke volume is large and the heart rate is increased. Untreated, it leads to pulmonary edema and death. When Hb is < 5.0 gm/dl and PCV below 14%, cardiac failure is seen in one third of cases.

The severity of anemia in pregnant women can be evaluated by measuring different blood indices such as hemoglobin concentration, packed cell volume (PCV), RBC count, total WBC (White Blood Cells) count and differential count, MCH, MCHC, ESR and platelet count.[7] About 50 million pregnant women are exposed to malaria especially in the high endemic regions.[8]

National Institute of Medical Sciences and Research, Jaipur (Rajasthan) had not carried out such type of study in recent "Tracking the severity of anemia in pregnancy: A 100 case prospective study", so there are need to conduct these type studies.

II. Materials and Methods

This descriptive study ("Tracking the severity of anemia in pregnancy: A 100 case prospective study"), was carried out on 100 pregnant women, during January 2018 to April 2018, those attended the antenatal OPD at NIMS&R Hospital, Shobha Nagar, NIMS University, Jaipur (Rajasthan) after obtaining human ethical approval. CBC (cell counter) and PBF was done and degree of anemia was measured as mild (10.0-10.9 gm/dl), moderate (7.0 to 9.9 gm/dl), severe (5.0-6.9 gm/dl) and life threatening (<5.0 gm/dl). In this study subjects was selected in different trimesters, vegetarian and non-vegetarian and excludes those belongs with Diabetes and any other complication related to abnormal pregnancy.

Statistics: The data was compiled, tabulated, analyzed with percentages. The data analysis done by using SPSS and explained in pie-chart.

III. Result

Table   1: Hemoglobin based distribution of pregnant women for severity of anemia:

Hemoglobin (gm/dl)	No. of women	Percentage	Severity
11.0 or higher	42	42	Normal
10.0-10.9	13	13	Mild
7.0-9.9	37	37	Moderate
< 7.0	08	8%	Severe

In our study, the upper table shows that 42 (42%) pregnant women have normal hemoglobin, 13 (13%) women suffered with mild anemic, 37 (37%) and 8 (8%) suffered with moderate and severe anemia correspondingly.

Table 2: Distribution of pregnant women according to trimester:

Trimester	No. of women	Percentage
1st	26	26
2nd	42	42
3rd	32	32

Out of 100 pregnant women, 26 (26%) pregnant women are in first trimester, 42 women with second trimester and remaining 32 women in third trimester.

Table 3: Severity of anemia among pregnant women in different trimesters:

Severity\trimester	1st	%	2nd	%	3rd	%	Total	%
Normal	08	19 %	20	47 %	14	33 %	42	42 %
Mild	02	15 %	05	38 %	06	46 %	13	13 %
Moderate	15	40 %	13	35 %	09	24 %	37	37 %
Sever	01	12 %	04	50 %	03	38 %	08	08 %
Total	26	26 %	42	42 %	32	32 %	100	100 %

In our study finding, the upper table shows that 42 (42%) pregnant women have normal hemoglobin, which of them 08 (19%), 20 (47%) and 14 (33%) women are belongs with 1st, 2nd and 3rd trimesters correspondingly. 13 (13%) women suffered with mild anemic, which of them 02 (15%), 05 (38%) and 06 (46%) women are belongs with 1st, 2nd 3rd correspondingly, whereas 37 (37%) and 8 (8%) suffered with moderate and severe anemia, in which 15 (40%), 13 (35%), 09 (24%) and 01 (12%), 04 (50%), 03 (38%) women belongs with 1st, 2nd and 3rd trimester correspondingly.

IV. Discussion

In past many years there has been a special interest in anemia with pregnancy but there is no proper diagnose and management. Hematological parametric study is one of the primary and cheapest methods to determine the severity of anemia in pregnancy. In our 100 cases prospective study, we have been tracking the severity of anemia in pregnancy at rural area of Jaipur, Rajasthan.

The present study resulted 58% pregnant women belongs with anemia which is less significant than the anemia prevalence 84.2% and in some district 90.1% represented in ICMR by *Toteja G.*[9] Whereas, a study done by *P.U. Okeke,*[10] resulted the prevalence of maternal anemia 38.8% much lesser than our study, and a high prevalence of anaemia, 65.6% was observed in pregnant women by *Cheema HK.*[2]

In our study the mean of hemoglobin is 10.28 gm/dl, whereas 8.46 gm/dl is resulted by *Sharma P et al.*[11] and similar resulted 10.1 gm/dl represented in anemic population by *Sunitha et al.*[12]

In our present results 13 (13%) women suffered with mild anemic are much better than 40.92% mild anemia showed by *Sharma P.*[11] Whereas 37 (37%) and 8 (8%) suffered with moderate and severe anemia in our study and 54.54% and 4.54% correspondingly resulted by *Sharma P.*[11] are not comparative. In another study by *Shah et al.*[13] on 51 pregnant anemic women 9 (18%) were mildly anemic, 30 (58%) were moderately anemic while 9 (18%) were severely anemic.

In another study resulted by *Aggarwal KN et al.*[14] showed 1.8 per cent women with haemoglobin <5.0 g/dl, 19.3 per cent with <8.0 g/dl and 9.2 per cent with < 7 g/dl haemoglobin level in pregnancy. The prevalence of anaemia is lowest in Kerala sated by *Kaur K et al.*[15]

In our outcome, 03 (38%) women belongs severe anemia in third trimester, this is better than 81.4% by *Cheema HK et al.*[2] in third trimester of pregnancy.

V. Conclusion

Anemia carry on to be a serious health trouble in India, it is related with high rate of morbidity and mortality, and one of the most commonly reasons are poverty and social deprivation. It is highly recommended that more efficient guidelines regarding educating girl child, spreading effective awareness regarding balanced diet, regular antenatal health check (hematological parameters can be easily performed) for safe motherhood.

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