



RESEARCH ARTICLE

AN ANALYTICAL STUDY IN NORTH EASTERN INDIA TO UNRAVEL THE TALE
OF ANAEMIA IN PREGNANCY

1,*Dr. Kallol Bhattacharjee, 2Dr. Manish Jain, 3Dr. Chandra Prakash Thakur,
4Dr. Dwijen Das and 5Dr. Soumya Shankar Paul

¹Associate Professor, Department of Medicine, Silchar Medical College & Hospital, Silchar

²Post Graduate Trainee, Department of Medicine, Silchar Medical College & Hospital, Silchar

³Post Graduate Trainee, Department of Medicine, Silchar Medical College & Hospital, Silchar

⁴Associate Professor, Department of Medicine, Silchar Medical College & Hospital, Silchar

⁵Resident Surgeon, Department of Obstetrics & Gynecology, Silchar Medical College & Hospital, Silchar

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ABSTRACT

Introduction: Anemia is a major public health issue affecting both developed and developing countries. As per WHO report (2011), globally 29.4% of women of reproductive age group and 38.2% of pregnant women are anemic. Same report revealed that 54% of pregnant women in India are anemic. There are various causes of anemia, most common being iron deficiency anemia, followed by nutritional deficiency anemia (folate, riboflavin, Vitamin B12) and many other causes. An anemic pregnant woman is at increased risk of not only of maternal and perinatal mortality but they are also at increased risk of serious impact on fetal health.

Aims and Objectives: To evaluate the prevalence and types of anemia in pregnancy and to correlate the fetomaternal outcome with various types of anemia.

Materials and Methods: A randomized prospective study was performed among first 500 pregnant women attending the Obstetrics and Gynecology outpatient department/ emergency labour room during the calendar year 2017 beginning with 1st January 2017. A total of 316 patients were included in study after applying inclusion and exclusion criteria and were subjected to detailed history, clinical workup and various investigations.

Results and Observation: Prevalence of anemia was 63.2% among pregnant women. Maximum number of cases was in age group 18-25 years of age (33%). Most of them belonged to rural community (63%) and from lower socioeconomic class (57.5%). Most cases had education up to primary level (54.3%) and were housewife by occupation (59.5%). Maximum number of cases was in 2nd trimester (43%) and mostly multigravida (57.5%). Most common presentations were fatigue (83%) and pallor (100%). Most patients were mildly anemic (51.8%) followed by moderate anemia (27.2%) and most common morphological type was microcytic anemia (56.5%). Most common etiology noted was iron deficiency anemia (80.3%) followed by combined iron and folate/ vitamin B12 deficiency (11%). In present study preterm delivery, IUD baby and low birth weight baby was seen in 15%, 3% and 7.8% of anemic patients attending labour room. A total of 4.8% mortality was noted among patients attending labour/ emergency room.

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INTRODUCTION

Anemia, a major public health issue affecting both developed and developing countries can be defined as "a condition of low circulating hemoglobin (Hb) in which concentration has fallen below a threshold lying at two standard deviations below the median of a healthy population of the same age, sex, and stage of pregnancy (Sharma et al, 2010)".

*Corresponding author: Dr. Kallol Bhattacharjee,
Associate Professor, Department of Medicine, Silchar Medical College & Hospital, Silchar.

According to WHO, hemoglobin level below 11gm/dl in pregnant women constitutes anemia and hemoglobin below 7gm/dl is severe anemia (World Health Organisation, 1992-1993). Global report according to WHO (2011) indicates 29.4% of women of reproductive age group and 38.2% of pregnant women suffer from anemia (The global prevalence of anaemia in 2011. ISBN 978 92 4 156496 0 (NLM classification: WH 155)). Further 54% of pregnant women in India are anemic which has also the highest prevalence among South Asian countries (Ezzati et al., 2002). There are various causes of anemia, most common being iron deficiency anemia,

followed by nutritional deficiency anemia (folate, riboflavin, Vitamin B12), acute and chronic infections (malaria, TB, cancer, HIV), worm infestation, and inherited or acquired disorders that affect hemoglobin synthesis, red blood cell production or red blood cell survival (e.g. hemoglobinopathies) and their proportion varies depending on geographical and other local conditions (Stevens *et al.*, 1995; WHO 2001 http://www.who.int/nutrition/publications/en/ida_assessment_prevention_control.pdf, accessed 7 May 2015; Stoltzfus *et al.*, 2004; Balarajan *et al.*, 2011; Tolentino, 2007). In pregnancy, anemia is usually associated with low birth weight and increased risk of maternal and perinatal mortality (Kozuki *et al.*, 2012; Steer *et al.*, 2000) Though mild anemia does not pose risk for current pregnancy but patient may become moderate to severe anemic in successive pregnancy, if not treated properly. Anaemia in severe degree can cause palpitation, tachycardia, and breathlessness and increased cardiac output aggravating the cardiac stress and can progress to decompensation and cardiac failure (Sharma, 2003). The association of anemia with increased preterm labour (28.2%), pre eclampsia (31.2%) and maternal sepsis are causes for significant concern (Indian Council of Medical Research, 1989). Besides contributing to maternal illness, it has serious impact on the fetal health, as it impairs the oxygen delivery via the placental circulation thereby, leading to impairment of intra uterine growth which in turn may lead to miscarriage or perinatal deaths (Sharma, 2003).

Aims and objectives

To evaluate the prevalence and types of anemia in pregnancy and to co relate the feto-maternal outcome with various types of anemia.

MATERIALS AND METHODS

A randomized prospective study was performed among first 500 women attending the Obstetrics and Gynecology outpatient department emergency labour room during the calendar year 2017 beginning with 1st January 2017.

Inclusion criteria

Any pregnant woman aged 18 years or more irrespective of parity with hemoglobin level less than 11 gm/dl was selected for study.

Exclusion criteria

Patients with history of blood transfusion in past one year, recent history of fluid loss like acute gastroenteritis, hyperemesis gravidarum or acute abdomen due to any cause, multiple pregnancy, multiparous women with less than two years of birth spacing, any acute gynecological or obstetrical emergency like ante partum hemorrhage, rupture of uterus, ectopic pregnancy or diagnosed IUD were excluded from the study. Other co morbid conditions like diabetes mellitus, active tuberculosis, malignancy, known sero-positive for HIV, HbsAg, HCV, mentally unstable persons or those with history of addiction or any substance abuse were not included in the study. The selected cases were subjected to detailed history, clinical workup with ante natal checkup and subjected to various investigations like CBC with PBF examination, routine examination of urine, stool, ABO and Rh typing, VDRL, fasting and post prandial glucose, serology for syphilis, HBsAg, HCV and HIV (voluntary).

RESULTS AND OBSERVATIONS

Of the 500 pregnant women attending the gynecological and obstetrics OPD and LR meeting the selection criteria, it was found that 316 cases (63.2%) had HB level < 11 gm/dl and were selected for study.

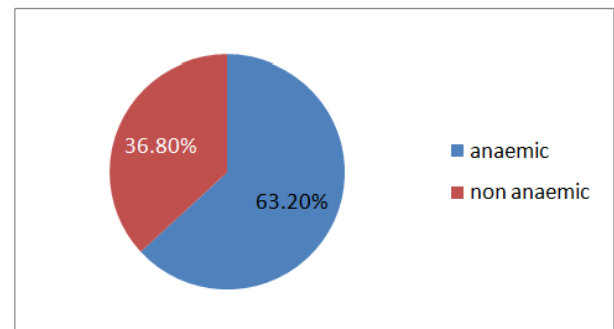


Fig.1. Distribution of anemia among pregnant women

Maximum numbers of cases (33%) were in the age group 18-25 years followed by the group 26-30 years where the incidence was 27%. The incidences in the age group 31-40 and 41-50 were 21% and 19% respectively. A rural predominance was observed with 200 (63%) were from the rural background and 116(37%) were from the urban areas. The lower middle class consisted of 134(42.4%) cases and lower economic groups consisted of 182(57.5%) cases with none from upper middle class or upper class. Educational level showed illiterate in 28(8.8%), primary level education in 171(54.3%), 10th standard level in 105(33.5%) and above 10th standard level in 12(3.4%) of cases respectively. The maximum number of cases were house wives 188(59.5%), followed by tea garden employees in 126(40%) and state Government employees in 2(0.5%) cases. The number of patients with regard to duration of pregnancy were 70(22%), 136(43%) and 110(35%) in first, second and third trimesters of pregnancy. As per the gravida, the figures were 66(21%), 68(21.5%) and 182(57.5%) for primi gravida, second gravida and multigravida respectively.

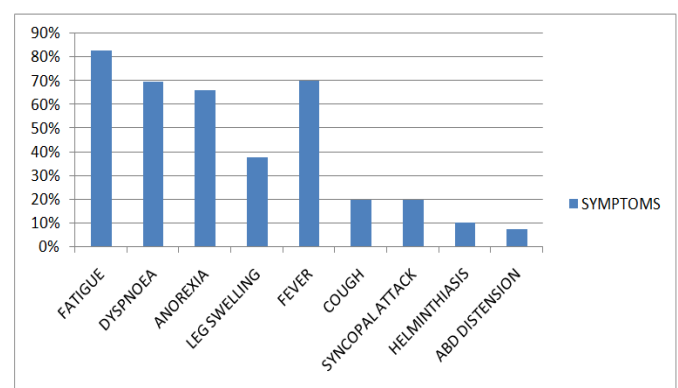


Fig. 2. Symptoms of patients at time of presentation

The important clinical manifestations were pallor in 316(100%), fatigue in 262(83%), dyspnea in 220(69.5%), anorexia in 208(66%), leg swelling in 120(38%), fever in 76(38%), cough and syncopal attack in 63(20%) each, helminthiasis in 33(10.5%) and abdominal distension in 24(7.5%) cases. The presenting clinical signs also included edema in 120(38%), stomatitis and nail changes either platynychia or koilonychias in 58(18.5%) each, splenomegaly in 25(8%) and hepatomegaly in 11(3.5%) of cases.

The cardinal cardio vascular manifestations were hemic murmur in 241(76.3%) and congestive cardiac failure in 39(12.3%) of cases.

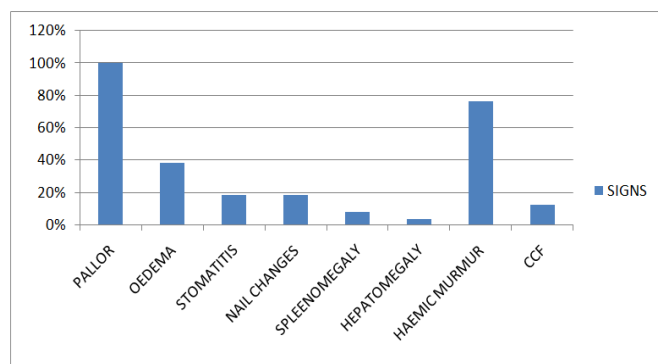


Fig. 3. Signs of patients at the time of presentation

The distribution of Hb levels is depicted in the table 1, shown below:

Table 1. Showing the Hb level

Hb level (g/dl)	No. of patients	% of cases
≤ 7.0	66	20.8%
7.1 – 10.0	86	27.2%
10.1-11.0	164	51.8%

The morphological types of anemia are shown in the table 2, shown below:

Table 2. Showing the morphological types of anemia

Types of anemia	No. of patients	% of cases
Normocytic	69	22
Macrocytic	24	7.6
Microcytic	179	56.5
Both micro and macrocytic	44	13.9

The various other abnormalities seen in the peripheral blood film examination re depicted in the table 3, shown below:

Table 3. Showing various abnormalities in peripheral blood examination

Abnormalities seen	No. of patients	% of cases
Hypochromia	246	77.8
Anisocytosis	176	55.7
Poikilocytosi	172	54.4
Target cell	35	11.1
Tear drop cell	11	3.5

Examination of stool revealed round worm ova in 39(12.3%), hook worm ova in 30(9.5%) and no evidence of helminthiasis in 247(78.2%) of cases.

The different etiological types of anemia are shown in the table 4 below:

Table 4. Showing the causes of anemia

Etiological types	No. of patients	% of cases
Iron deficiency	254	80.3
Megaloblastic	19	6.0
Combined iron and folate/ vit B ₁₂ deficiency	36	11.0
Anaemia of chronic disease	6	1.8
Thalassemia intermedia	1	0.3

Out of total anemic cases, 254(80.3%) cases of anemia were due to iron deficiency, 30(9.5%) were due to hook worm

disease, 19 (6.0%) were megaloblastic anemia, 36(11%) were due to combined iron and folate/ vitamin B12 deficiency, 6(1.8%) cases were due to anemia of chronic disease, (three were treated cases of pulmonary tuberculosis and the remaining three had hypothyroidism) and one case was of thalassemia intermedia on electrophoresis.

Fetal and maternal outcome

Out of 316 patients included in the study, 166(52.5) cases attended the ER/ Labour room for delivery. The mode of delivery or the place of child birth of the rest of the cases was not known. Among 166 cases attending the labour room, 25(15%) cases had pre term delivery while 5(3%) cases had presented with intra uterine death (IUD) of the fetus. The birth weight ≥ 2.5 kg and <2.5 kg were 148(89%) and 13(7.8%) respectively in cases of live birth. The reasons for hospitalizations were 125(75.3%) for delivery, 40(24.1%) for congestive cardiac failure and 1(0.6%) for anasarca. Out of 40 cases of CCF, 1 case died on the day of admission and 7 other cases died of anemic heart failure after delivery. Rest of the cases improved after blood transfusion, replacement therapy and other conservative mode of management. The case with anasarca had additional protein deficiency and expired on the 3rd day of admission. All the 8(4.8%) deaths occurred in patients whose Hb level was ≤ 6.0 gm/dl and all the 40 cases of CCF were seen in cases who were multiparous having Hb level in the range ≤6.0 – 8.0 gm/dl. CCF may be attributed due to anemia, nutritional deficiency and failure to cope with hemodynamic changes that occur in pregnancy. It was also observed that all the 21 cases with Hb level < 6.0 gm/dl were from the rural areas with an educational background of either primary level or illiterate. An important analogy derived from the study is fetomaternal outcome in anemia in pregnancy are influenced by maternal factors like educational level, socio economic status, residential background, age, parity, nutritional status, severity of anemia and the status of health care and appropriate interventions at any of these levels may effect a change.

DISCUSSION

Prevalence of anemia in this study was found to be 63.2%, which is similar to study conducted by Pangel *et al.* (2010) (51%) and National Family Health Survey (NFHS-2) (47.9%). The maximum impact of anemia (33%) followed by 27% and 21% were seen in the age group 18-25, 26-30 and 31-40 years respectively. The relatively higher incidences of anemia in the reproductive age group is in agreement with various other studies (Viveki R. G. *et al.*, 2012; Sharma *et al.*, 2013). Socio-demographic profile like anemia is more prevalent in the rural areas(63%), most of the cases from the lower or lower middle class socio economic group, most common occupation is housewife(59.5%), education status(54.3% were educated up to primary education), and maximum patients were multigravida (third parity 57.5%) are in agreement with views expressed in various studies (Gautam *et al.*, 2010; Jin *et al.*, 2010; Dim *et al.*, 2007; Kisioglu *et al.*, 2004; Ketut Suega *et al.*, 2002). It was also observed that anemia was more common in the second trimester (43%), while in first and third trimester, the incidences were 35% and 21% respectively. However, these findings could not be compared with studies by other researchers due to paucity of work in this field. It could be possible that due to the physiological changes during this period, anemia is more common in the second trimester.

Severity of anemia was divided in mild, moderate and severe with 51.8%, 27.2% and 20.8% cases respectively in each group which is slightly different from findings of study conducted by Melku M. *et al* 2014 (64%, 30% and 6% respectively) and Viveki R.G. *et al* 2012 (25.4%, 50.4% and 7% respectively). Most common pattern of morphology in peripheral blood film was microcytosis (56.5%) which is similar to finding of Viveki R.G. *et al* 2012 but different from study of Melku M. *et al.* (2014). Hook worm infestation was found in 9.5% of cases which is similar to various studies (Aikawa *et al.*, 2006; Belachew *et al*, 2006). In present study preterm delivery, IUD baby and low birth weight baby was seen in 15%, 3% and 7.8% of anemic patients attending emergency or labour room in our set up. This finding is similar to findings of Zhang Q *et al.* (2009), Lone *et al.* (2004) K Jagadish Kumar *et al.* (2013) who also noted that preterm delivery and low birth weight baby is related to severity of anemia. We also noted that 8 (4.8%) deaths among patients attending emergency room/labour room. All the 8 deaths occurred in patients whose Hb level was ≤ 6.0 gm/dl. There were 40 cases of CCF, all of whom were multiparous having Hb level in the range $\leq 6.0 - 8.0$ gm/dl. CCF may be attributed due to anemia, nutritional deficiency and failure to cope with hemodynamic changes that occur in pregnancy. It was also observed that all the 21 cases with Hb level < 6.0 gm/dl were from the rural areas with an educational background of either primary level or illiterate.

Conclusion

An important analogy derived from the study is fetal/maternal outcome in anemia in pregnancy are influenced by maternal factors like educational level, socio economic status, residential background, age, parity, nutritional status, severity of anemia and the status of health care and appropriate interventions at any of these levels may effect a change.

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