Study of Type and Severity of Anemia in Antinatal Cases in a Mountanous Hilly Region of J&K India

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ABSTRACT

Introduction: Anemia in expectant women is a serious world-wide public health problem with adverse pregnancy outcomes. It remains one of the India's major public health problem irrespective of the fact that it is preventable and easily treatable. The present study was being done to assess the severity and type of anemia in a hilly mountaneous region of J&K India in GMC Doda.

Material and methods: The present study was conducted among the pregnant women coming for antenatal check-up in rural hilly mountanous region of J&K in GMC Doda.In this study of two months duration, A total of 700 pregnant women were included in our study in the reproductive age group from 18 to 45 years. Hb estimation was done with Sahli.s method. Anemia in this study was defined by using World Health Organisation and was classified into mild anemia (Hb 10-10.9g/dl), moderate anemia (Hb 7-9.9g.dl) and severe anemia (Hb <7g/dl). A peripheral smear was also made to study the type of anemia as normocytic normochromic, microcytic hypochromic, macrocytic or dimorphic anemia.

Results: Out of total 700 cases, 574(82%) cases were found to be anemic. The hemoglobin concentration ranged from 5-12.5gm/dl with a median of 8.7gm/dl. Majority of the pregnant females were less than 30 years of age . Out of the anemic cases, 60% were moderately anemic followed by 28% mildly anemic cases and 12% severely anemic cases. Morphological subtyping showed that majority of the cases had microcytic hypochromic anemia (43%). Normocytic normochromic anemia was 25% followed by dimorphic anemia in 27% and 5% cases showed macrocytic anemia

Conclusion: The high prevalence of anemia in our study hints towards more strict measures in investigating and screening of pregnant women. Screening and treatment of parasitic infections should also be encouraged. Health education talks on nutrition needs, education of mothers should also be carried out. Therefore to reduce the deleterious effect on health of mother and child early intervention by clinicians is also needed

Keywords: Anemia, Iron, India, Nutrition, Programmes, Expectant, Preventable, Severity

INTRODUCTION

Anemia is a global public health problem affecting both developing and developed countries.[1] The burden of this disease is heavy yet poorly estimated. Iron deficiency anemia is the third leading cause of disability adjusted life years lost in females aged 15-44 years as per WHO rankings.[2] Anemia in pregnancy is defined as hemoglobin concentration less than 11gram/dl and hematocrit less than 33gram percent.[3] WHO further subclassified anemia into mild anemia (10.10.9gram/

dl), moderate anemia (7-9.9gram/dl) and severe anemia (<7 gram/dl).[4] Etiologically anemia can be classified into 3 major groups i.e nutritional, marrow disease and hemolytic disease. Iron deficiency anemia is the most prevalent form (76%) followed by folate deficiency (20%) and combined iron-folate deficiency (20%).[1]

Great variations are seen in the prevalence of anemia in pregnancy in different parts of the world. A crude estimate is that 500 million women between 15 to 49 years of age world wide are anemic.[3] The World Health Organization estimated that 56% of all pregnant women in developing countries are anemic, about 75% are from Southern Asia, and 88% from India.[5] Anemia is primarily responsible for 20% maternal deaths and is an associated cause in another 20%.[6] Prevalence of anemia in India as per WHO is in the range of 33-89% and is different in different regions of the country.[3] 19% maternal deaths are due to anemia in India.[7]

Maternal anemia increases the risk of low birth weight, premature delivery, intrauterine growth retardation, perinatal and neonatal mortality, inadequate iron stores for newborn and increased risk of maternal morbidity. The increasing prevalence of maternal anemia is not only a serious hazard for the patient but also for their family and for economic development of the country.[7] Therefore, this study attempted to determine anemia in pregnant women in rural hilly mountaneous region of J&K in GMC Doda.

MATERIAL AND METHODS

The present study was conducted among the pregnant women coming for antenatal check-up in rural hilly mountanous region of J&K in GMC Doda. A total of 700 pregnant women were included in our study in the reproductive age group from 18 to 45 years. Hb estimation was done with Sahli.s method in which

EDTA containing whole blood is mixed with an acid solution so that hemoglobin is converted to brown coloured acid hematin. This was then diluted with water till the brown colour matches that of the brown glass standard.The hemoglobin

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value is read directly from the scale. 20 microlitre of EDTA mixed blood was collected using a fixed volume pipette and transferred into a test tube containing N/10 HCL upto mark 2g%.This mixture was kept for 10 minutes, then distilled water was added till the brown colour matches that of the brown glass standard.

Anemia in this study was defined by using World Health Organisation and was classified into mild anemia (Hb 10-10.9g/dl), moderate anemia (Hb 7-9.9g.dl) and severe anemia (Hb <7g/dl). A peripheral smear was also made to study the type of anemia as normocytic normochromic, microcytic hypochromic, macrocytic or dimorphic anemia. The size of RBC was compared to the nucleus of small lymphocyte to label a cell as microcytic, normocytic or macrocytic. If the area of the central pallor was more than one third of cell diameter the cell was counted as microcytic hypochromic. Simple tabulation and proportions were calculated.

RESULTS

In this study of two months duration 700 cases were collected. Out of 700 pregnant females coming for antenatal check-up in a hilly mountaneous region of J&K India in GMC doda, 574(82%) cases were found to be anemic which is a staggering level of anemia. The hemoglobin concentration ranged from 5-12.5gm/dl with a median of 8.7gm/dl. Majority of the pregnant females were less than 30 years of age (Table1). Out of the anemic cases, 60% were moderately anemic followed by28% mildly anemic cases and 12% severely anemic cases (table2). Morphological subtyping showed that majority of the cases had microcytic hypochromic anemia (43%). Normocytic normochromic anemia was 25% followed by dimorphic anemia in 27% and 5% cases showed macrocytic anemia (Table3). Out of
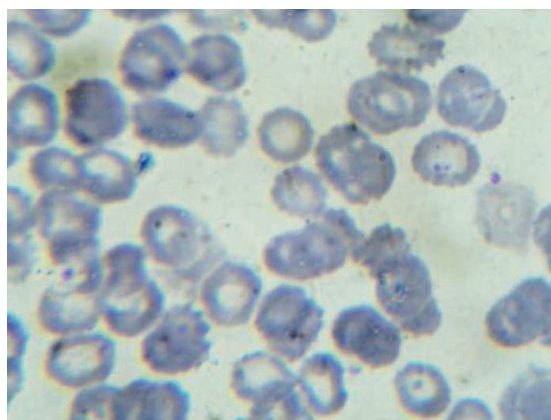

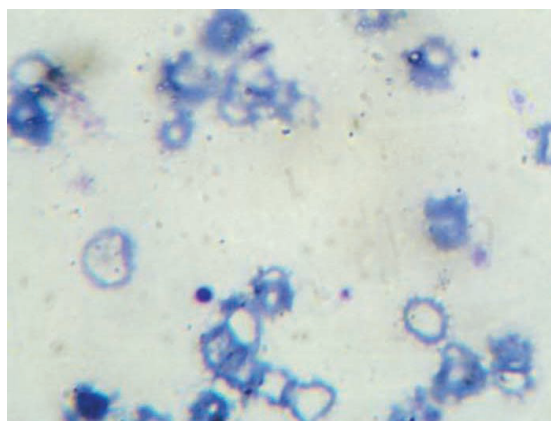**Figure-1:** Macro-ovalocytes in Megaloblastic anemia

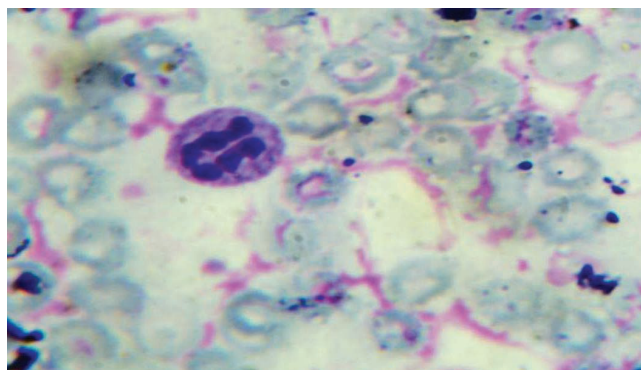**Figure-2:** Microcytic hypochromic blood picture in IDA

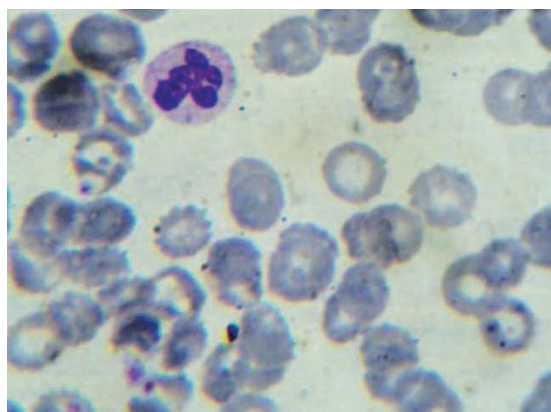**Figure-3:** Photomicrograph showing Hypersegmented neutrophil in Megaloblastic anemia

Figure-4: Photomicrograph showing Macrocytic and microcytic hypochromic red cells with hypersegmented neutrophil in DDA

Age group	Number of cases
15-25	439
26-35	241
36 -45	20
Total	700
Table-1: Age wise distribution of cases	

Grades of Anemia	Total number of patients	Percentage
Mild (10-10.9)	161	28%
Moderate(7-9.9)	344	60%
Severe(<7)	69	12%
Total	574	100%
Table-2: Severity of Anemia in pregnant females		

Type of Anemia	Number of Patients	Percentage
Microcytic hypochromic anemia	247	43%
Normocytic normochromic anemia	143	25%
Dimorphic anemia	155	27%
Macrocytic anemia	29	5%
Total	574	100%
Table-3: Morphological type of anemia in pregnant females		

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total 700 cases, maximum number of cases were found in age group of 15-25 years. Out of total 700 cases, 161cases (28%) were mildly anemic, 344cases(60%) were moderately anemic and 69(12%) cases were severly anemic (Fig. 1-4).

DISCUSSION

Pregnant women are one of the vulnerable groups of a population to develop anemia especially in developing countries. Important factors which aggravates anemia in pregnancy includes reduced intake and increased demands of iron, pre-pregnant health status, excess iron demand in multiple pregnancies, blood loss during labour, inflammation and infectious diseases.[8] Therefore, this study aimed to determine anemia in pregnant women in a hilly mountaneous region of J&K India in GMC Doda . Anemia cases among pregnant women in the present study was very high (82%). Our study was similar to studies done by G.S Toteja (84.9%).[9] In India, study of anemia in pregnant women in Rajasthan was comparable to our study (84%).[7] In a study by Agarwal et al, it was found that 84% pregnant females were anemic.[10] Reasons for increased incidence of anemia in pregnancy include increased demand by the growing fetus, decreased intake due to poor appetite and vomiting of pregnancy, faulty dietary habits, pre-pregnancy anemia, decreased inter-pregnancy interval, worm infestation, poor availability of iron in food stuffs and various food fads practiced by various societies during the pregnancy.[11]

Anemia has adverse impact on maternal as well as child health. A number of programs have been started by the Governments of different countries to tackle this issue. Recently iron fortified foods have been approved by the food regulatory authorities of many countries.[12]

Socio-economic factors and geographical variation might be responsible for different prevalence of anemia across countries and regions. Different methods of hemoglobin estimation along with different cut-off points may also result in variation of prevalence of anemia in pregnant women.[13]

In our study moderate anemia was found to be highest 60% followed by mild anemia 28% and severe anemia 12%. The findings are consistent with the study done by Mridul Malakar who conducted the study in Lakhimpur district of Assam and found the prevalence of moderate anemia as 61.0% followed by mild anemia 29.5% and severe anemia 2.3%.[14] The low prevalence of severe anemia is in concordance with the other studies conducted in India by G.S Toteja (13.1%).[9] It is a favourable sign that pregnant women suffering from severe anemia are not found in alarming numbers. However, high prevalence of moderate and mild anemia in our study alarms us to take prompt action to minimize the overall high load of anemic pregnant women in this area. Severe anemias are mostly related to parasitic infections (malaria, intestinal worms). Low incidence of severe anemia indicates that the intervention strategies for the control of infectious disease are successful in our area. Morphological typing in our study showed that microcytic hypochromic anemia (43%) is most prevalent followed by

normocytic normochromic anemia (25%), dimorphic anemia (27%) and macrocytic anemia (5%). The findings were in concordance with study done by Babita Bansal in Rajasthan who quoted the prevalence of microcytic hypochromic anemia to be slightly higher (47.6%) followed by normocytic normochromic anemia (35.7%).[7] The commonest type of anemia in pregnancy is iron deficiency anemia.[15] The requirement of iron is 1000mg during pregnancy and diet alone cannot replenish the extra iron needed. If the body iron stores are already deficient, iron deficiency anemia manifests.[16] Though no iron estimation studies were done but the commonest cause of microcytic hypochromic anemia is iron deficiency anemia.

CONCLUSION

Anaemia in pregnancy is associated with adverse consequences both for the mother and the foetus. Studies have shown that the adverse consequences of maternal anaemia may affect not only the neonate and infant but also increase the risk of non- communicable diseases when the child grows into an adult and the risk of low birth weight in the next generation. The high prevalence of anemia in our study hints towards more strict measures in investigating and screening of pregnant women. Screening and treatment of parasitic infections should also be encouraged. Health education talks on nutrition needs, education of mothers should also be carried out. Poverty, ignorance, nonavailability and failure to utilise available facilities play an important role in maternal anemia. Therefore to reduce the deleterious effect on health of mother and child early intervention by clinicians is also needed.

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