

Original Article:

High prevalence of anaemia in pregnant women of Lakhimpur District of Assam

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Date of submission: 15 June 2014 ; Date of Publication: 22 September 2014

ABSTRACT:

Introduction: Being a major public health problem in India, anaemia is the key underlying cause for 20-40 per cent of maternal deaths in our country. Despite of the availability of cost effective technology for detection and affordable treatment of anaemia, it remains as the most common nutritional deficiency disorder in India and in entire South-Asia.

Methods: Total 400 nos. of confirmed pregnant women were selected by simple random sampling in a hospital based study. Blood samples were collected from the patients after taking necessary consent. Estimation of Haemoglobin and blood grouping were carried out using standard procedure. Socio-demographic information of the patients like age, sex, caste, religion, community etc. were collected by face to face interview, recorded in a structured questionnaire, entered in SPSS for analysis.

Results: The prevalence of anaemia among the pregnant women in Lakhimpur district was found as 92.8 %. Among the pregnant women, prevalence of moderate anaemia was found to be highest 61.0 %, followed by mild anaemia 29.5 % and severe anaemia 2.3 %. Those who belong to the age group of 20-24 years showed highest 51.2 % prevalence of anaemia. Highest numbers of anaemic patients were found in the Scheduled Tribes followed by Tea Garden communities.

Conclusion: Our study revealed a very high prevalence of anaemia in pregnant women of Lakhimpur district of Assam, which needs immediate attention. Awareness regarding health & nutrition, supplementation of iron and folic acid tablets through different government and individual capacities can reduce the magnitude of this problem.

Keywords: Anaemia, Pregnancy

Introduction:

The estimated worldwide prevalence of anaemia according to the WHO Global Database on Anaemia for 1993-2005 was 25 per cent (1). The estimated range of the prevalence of anaemia was 9 % in developed countries to 43 % in less developed countries (2, 3). Anaemia is a major public health problem in India and it is among the countries with high prevalence of anaemia in the world. In India, nearly 58 per cent of pregnant women are anaemic

and it is estimated that anaemia is the underlying cause for 20-40 per cent of maternal deaths in India (3). India contributes to about 80 per cent of the maternal deaths due to anaemia in South Asia (4).

Anaemia is a condition in which the number of red blood cells (and consequently their oxygen-carrying capacity) is insufficient to meet the body's physiologic needs (5). The function of the RBCs is to deliver oxygen from the lungs to the tissues and carbon dioxide from the tissues to the lungs. This is

accomplished by using haemoglobin (Hb), a tetramer protein composed of haem and globin. Anaemia impairs the body's ability for gas exchange by decreasing the number of RBCs transporting oxygen and carbon dioxide (3). Anaemia results from one or more of the following process: defective red cell production, increased red cell destruction or blood loss (3). Iron deficiency is thought to be the most common cause of anaemia globally, but other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and chronic inflammation, parasitic infections, and inherited or acquired disorders that affect haemoglobin synthesis, red blood cell production or red blood cell survival, can all cause anaemia (5). In pregnancy, iron deficiency anaemia can lead to perinatal loss, prematurity and low birth weight (LBW) babies. Iron deficiency anaemia also adversely affects the body's immune response (3, 6).

As per WHO recommendation, 11 gm percent is the normal haemoglobin level in pregnancy (5). Hence, any haemoglobin level below 11gm in pregnancy should be considered as anaemia. However in India and most of the other developing countries, the lower limit is often accepted as 10 gms percent (6). WHO classifies degree of anaemia as mild (10-10.9 gm %), moderate (7-9.9 gm %) and severe (<7 gm %) (5).

Anemia in pregnancy is a known risk factor for many maternal and fetal complications. Severe anaemia in pregnancy impairs oxygen delivery to the foetus and interferes with normal intra-uterine growth, resulting in intrauterine growth retardation, stillbirth, LBW and neonatal deaths. Therefore, anaemia is a major contributor to poor pregnancy and birth outcomes in developing countries as it predisposes to premature delivery, increased perinatal

mortality and increased risk of death during delivery and postpartum (3, 5, 7). In Assam, anaemia in pregnant women is fairly high. As per National Family Health Survey-III (2005-06), the incidence of anemia has been found as 72 percent among the pregnant women within the age group of (15-49) years in Assam. In rural areas, it was 72.7 percent. The all India figure is 57.9 percent among the pregnant women within the age group of (15-49) years and 59 percent in rural areas. Most significantly, the prevalence of anemia in the state of Assam is getting worse since it has increased by 3 percent during 1998-99 to 2005-06 (8, 9). The Lakhimpur is an underdeveloped and badly flood affected district of Assam, where different peoples belonging various caste, communities and religion lived together. Considering the above cited points, this study was undertaken to determine the prevalence of anaemia among pregnant women in Lakhimpur district of Assam, which can help to understand the magnitude of the problem and thereby can help to take necessary measures for control & prevention of this major public health problem.

Materials and Methods:

Study Area:

The study area is Lakhimpur district of Assam, which occupies an area of 2,277 square kilometres and lies between approximately 26.48' & 27.53' northern latitude and 93.42' & 94.20' eastern longitude with a total population of 1,040,644 (2011 census).

Study Design & Sample Collection:

After getting work permission from the ethical committee of joint director of health services of Lakhimpur district, random samples were collected from pregnant women who visited the North Lakhimpur Civil hospital for their check-up during pregnancy. This government Civil Hospital is located

at the heart of the district and specialist doctors are available there. Patients from all the corners of the district visit this hospital. Before collecting samples, necessary consent was obtained from both the patient and guardian to perform the test. Blood samples were collected from the patient in a sterile, clean and plain test tube. This study was for a period of 8 months from March to October, 2013.

Laboratory Methods:

Haemoglobin Estimation: 0.1 Normal hydrochloric acid was added up to lowest mark of the graduated haemoglobin tube and mixed with the 20 μ l blood samples. In this mixing till 10 minutes, acid haematin was formed which can be observed as a brown coloured complex. The complex was diluted with distilled water by mixing drop by drop, till the matching of the colour with the brown glass comparator tubes of Sahli hemoglobinometer. The level of the match mark of the graduated tube of diluted samples with comparator tubes was the haemoglobin level of the patient.

ABO & Rh(D) grouping: The human blood antigen A, B and D were detected by using Anti-A, Anti-B and Anti-D antibodies (IgM antibodies). In this test, diluted washed red cells were collected in a glass slide's three different area as drop for Anti-A, Anti-B and Anti-D one each. Then the Anti-A, Anti-B and Anti-D sera were added separately in each drop of washed red cells. Where Anti-A reacts with the blood and form agglutination then it was "A" group, where Anti-B then it was "B" group and where both Anti-A & Anti-B form agglutination, then it was "AB" group. If none of them reacts or not formed any agglutination, then it was reported as "O" group. Same way, if the blood reacted with Anti-D and formed agglutination, then it was regarded as Anti-D Positive, otherwise, it was negative. The agglutination

was confirmed Under 10X (low Power) microscopic observation. The generated data was compiled, entered and analysed in the statistical package SPSS, version-17 (SPSS Inc., Chicago, USA).

Results & Discussion:

Total 400 nos. of confirmed pregnant women were screened for determination of anaemic status and their blood groups were also detected. We have determined the degree of anaemia as mild (10-10.9 gm %), moderate (7-9.9 gm %) and severe (<7 gm %) as per WHO protocol (5). Among the pregnant women, 92.8% of them were found as anaemic (including all types of anaemia viz., mild, moderate and severe) which is a very alarming situation (Fig-1). Only 7.2% pregnant women of Lakhimpur district was found as non-anaemic. Earlier, many studies across India also reported high percentage of overall anaemia in pregnant women in different region (10-15). Fig-2 showed the anaemic status in terms of severity among pregnant women in Lakhimpur district of Assam. Among the pregnant women, prevalence of moderate anaemia was found to be highest 61.0 %, followed by mild anaemia 29.5 % and severe anaemia 2.3 %. It is a good sign that pregnant women suffering from severe anaemia are not found in alarming numbers. However, as significant numbers of the moderate and mild anaemic patients were found in our study, prompt action from the concerned departments and health institutions are needed to minimize the overall high load of anaemic pregnant women in this area.

The prevalence of anaemia (mild, moderate & severe) in different age groups among pregnant women in Lakhimpur district of Assam has been presented in Fig-3. The highest prevalence of anaemia was observed in the age group of 20-24 years (51.2 %), followed by 25-29 years (28 %), 15-

19 years (10.8 %), 30-34 years (5.9 %), 35-39 years (3.5 %), 40-44 years (0.3 %) and above 45 years (0.3 %) of pregnant women. So, pregnant women who belong to the overall age group of 20-30 years are the most suffered group which required immediate attention. Previous three studies from different parts of India (16-18) also reported highest prevalence of anaemia in the 20-24 years age group.

Table-1 demonstrated the age-group wise distribution of anaemia in terms of severity among pregnant women and it revealed that moderate anaemia is found in every age group ranging from almost 50-63 %, followed by mild anaemia ranging from 24-43 % and severe anaemia ranging from 2-4 %. No significant risk association between age group and anaemic status was observed in our study, which is similar with one earlier study (18).

The Fig-4 demonstrated the religion-wise distribution of anaemia among pregnant women, where it has been observed that 94.5 % of Hindu women are suffering from anaemia, whereas 87.6 % Muslim pregnant women are anaemic. However, very few women belong to the Christian religion and they all are found anaemic. Earlier, Biswaset *al.*, (18) also reported high prevalence of anaemia among Pregnant Hindu women as compared to Muslim women in their study.

Status of anaemia among pregnant women in different communities who are inhabitant of Lakhimpur district have been described in Fig-5, which revealed that highest numbers of anaemic patients were found in the Scheduled Tribes, Tea Garden, Koch, Bengali, Nepali community (all are 100 %), followed by Scheduled Caste (97.1 %), Ahom (92.9 %), Missing (92.3 %), Brahmin (88.9 %), Muslim (87.6 %), Kalita (81.2 %) community in our study.

Among the anaemic pregnant women, the community wise distribution have been presented in Fig-6, which demonstrated that the highest nos. of anaemic patients belong to the Ahom community (28.0 %), followed by Muslim (24.8 %), Scheduled Caste (9.2 %) community etc. and the least nos. of anaemic patients belong to the Nepali (1.1 %) community. We have also determined the blood groups of the patients. In Fig-7, the blood group distribution among the anaemic pregnant women have been presented and it revealed that 43.9 % of the pregnant women have the O+ blood group, 26.1 % belong to the B+ blood group, 24.0 % A+ blood group, 5.1 % AB+ blood group, 0.5 % O- blood group and 0.3 % belong to the A- blood group. However, no significant risk association of blood groups with anaemic status was found in SPSS analysis in our study.

Conclusion:

Our study revealed a very high prevalence of anaemia in pregnant women of Lakhimpur district of Assam, which needs immediate attention to prevent any subsequent complicacy of mother and foetus. Education and awareness regarding health and nutrition among the community and supplementation of iron and folic acid tablets through different government programme, NGOs and individual capacities can minimize the magnitude of the problem.

Acknowledgements:

We acknowledge the Joint director of health services to permit us to carry out our works at North Lakhimpur Civil Hospital, the Hospital Superintendent, the Laboratory Technicians (Pankaj Mahanta & Thaneswari) and other paramedical staffs to help us in various steps of the study.

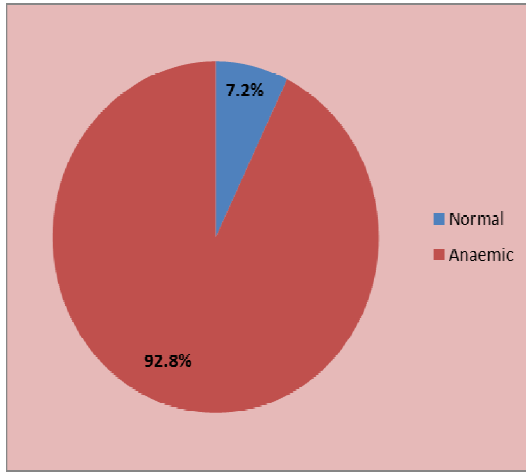


Fig-1: Diagram showing prevalence of Anaemia among pregnant women in Lakhimpur district of Assam

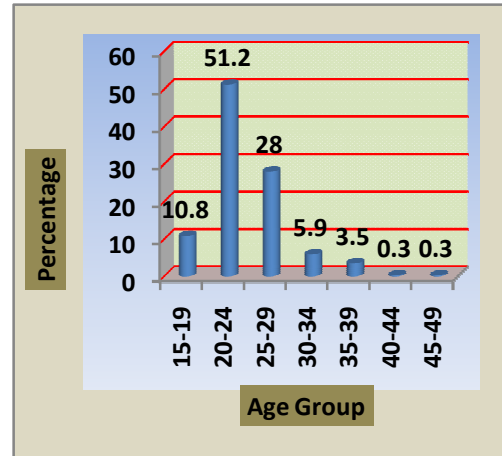


Fig-3: Prevalence of Anaemia (mild, moderate & severe) in different age groups among pregnant women in Lakhimpur district of Assam.

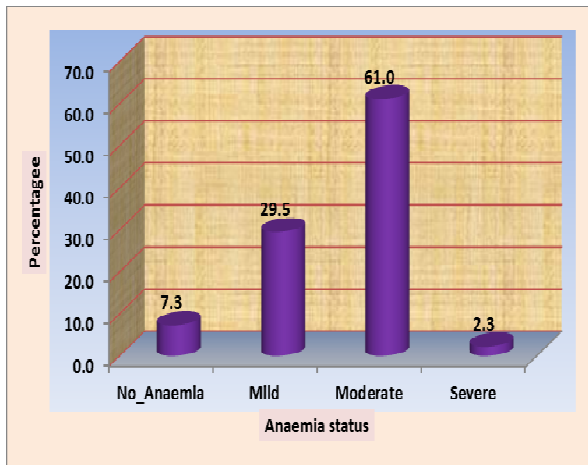


Fig-2: Anaemic status in terms of severity among pregnant women in Lakhimpur district of Assam.

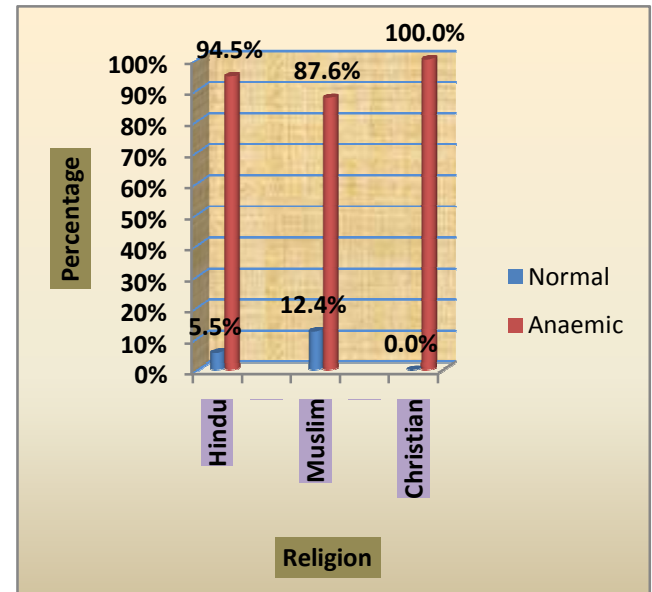


Fig-4: Religion-wise distribution of Anaemia among pregnant women in Lakhimpur district of Assam.

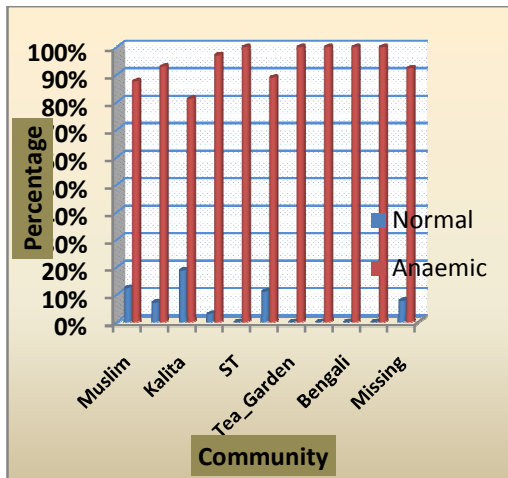


Fig-5: Status of Anaemia among pregnant women in different communities of Lakhimpur district of Assam.

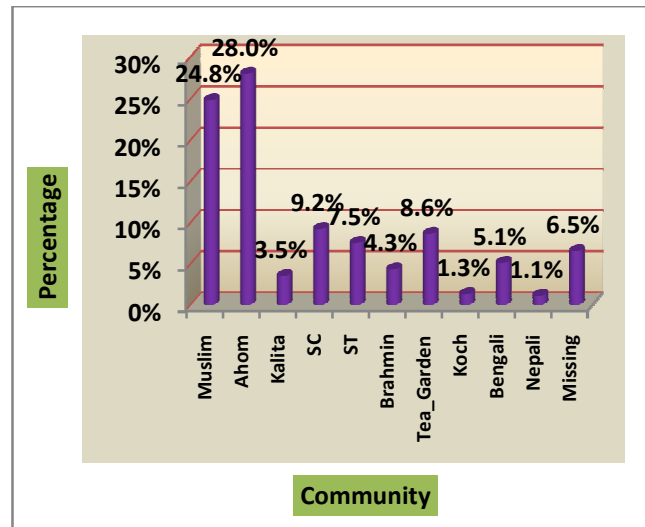


Fig-6: Distribution of Anaemic Pregnant Women in different communities of Lakhimpur district of Assam.

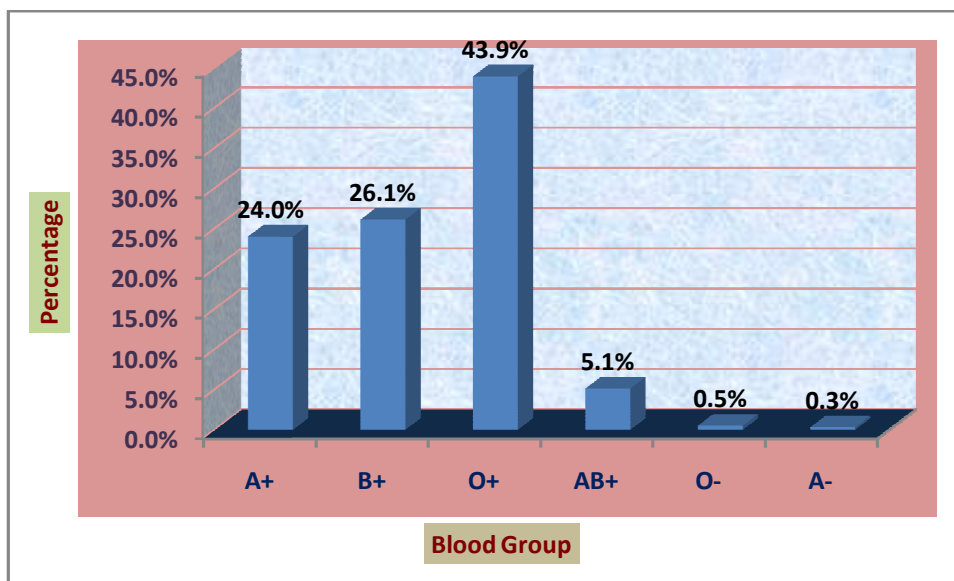


Fig-7: Blood group distribution among anaemic pregnant women of Lakhimpur district of Assam.

Age Group	No Anaemia	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Total Patient
15-19	1 (2.4%)	13 (31.7%)	26 (63.4%)	1 (2.4%)	41 (100.0%)
20-24	14 (6.9%)	56 (27.5%)	130 (63.7%)	4 (2.0%)	204 (100.0%)
25-29	10 (8.8%)	36 (31.6%)	65 (57.0%)	3 (2.6%)	114 (100.0%)
30-34	3 (12.0%)	6 (24.0%)	15 (60.0%)	1 (4.0%)	25 (100.0%)
>=35	1 (6.25%)	7 (43.75%)	8 (50.0%)	0 (0.0%)	16 (100.0%)
Total	29 (7.2%)	118 (29.5%)	244 (61.0%)	9 (2.3%)	400 (100.0%)

Table-1: Age-group wise distribution of anaemia in terms of severity among pregnant women in Lakhimpur district of Assam.

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