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Maternal Anaemia: A Prevailing Burden In Assam, India

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Abstract: *Anaemia in pregnancy, particularly iron deficiency, is a prominent unsolved problem in India. The aim of this study was to identify the prevalence of anaemia among pregnant women attending ante-natal OPD units of Gauhati Medical College & Hospital, Guwahati, Assam. About 250 pregnant women were screened for anaemia using cyanmethemoglobin method during the first ante-natal visit. The prevalence of anaemia was found to be 50.4 per cent. The findings of the study further revealed that the prevalence was higher among young women, women belonging to low socioeconomic status and women with short pregnancy intervals and higher parity. High prevalence rate of anaemia observed in the present study suggests to strongly implement various improved preventive strategies, especially advocacy, compliance and monitoring of the iron and folic acid supplementation.*

Keywords *– Anaemia, Pregnancy, Prevalence, Advocacy, Compliance, Monitoring, Cyanmethemoglobin*

I. Introduction

The present descriptive study is an attempt to determine the prevalence and explore the determinants of anaemia in pregnancy by a hospital based study, in the suburbs of Guwahati, Assam.

Prevalence of anaemia in South Asia is among the highest in the world, mirroring overall high rates of malnutrition. The prevalence of anaemia among all women in the Indian sample is 52%. (1) The Indian subcontinent alone contains nearly half the world's anaemic women.(2) WHO has recommended a cut-off value of 11.0 gm/dl to define anaemia at any time during pregnancy. Plasma volume and red cell mass increase by 50% and 18-25% respectively, resulting in dilutional decrease in haemoglobin concentration called the physiological anaemia of pregnancy. Pathological anaemia of pregnancy is mainly due to iron deficiency. (3) Adolescent pregnancy, frequent successive pregnancies, recurrent abortions, bad obstetric history, nutritional deficiencies, poor socioeconomic and educational status with concurrent medical diseases may contribute to an anaemic process. (4)

The prevalence of anaemia in urban areas, rural areas and endemic areas of hook-worm infestation is 40 to 50%, 50 to 70% and 90% respectively. (5) Iron deficiency anaemia (IDA) can result into serious outcomes in pregnancy like maternal mortality, preterm delivery, still births and low birth weights (Quillain et al., 1983; Sapre and Soshi, 1996, Spinillo et al., 1999). (6) A public health problem like IDA, which is complex and has a multifaceted etiology, needs to be tackled concurrently through several approaches which call for innovative thinking. It is unfortunate that IDA is a major problem in most of the South Asian countries in spite of the knowledge that has been accumulated over the years about its etiology and prevention (Rajaratnam et al ; 1999) .(7)

The association between birth outcomes and anaemia is strongest in early pregnancy suggesting that pre-pregnancy improvements in iron status are warranted (Gillespie : 1997; Mother Care : 1994).The high prevalence of anaemia among women in India is a burden for them, for their families & for the socioeconomic development & productivity of the country. The high level of anaemia is imputed to nutritional deficiency & lack of quality care. (7) The National Institute of health & clinical excellence (NICE) advices that women should be offered screening for anaemia at booking and at 28 weeks of gestation.(8)

In this cross sectional study, it is concluded that the determinants of anaemia in pregnant women had a significant role to play in its persistent prevalence and new modified program strategies are the need of the hour to improve particularly the overall nutrition status of women of reproductive age group. Efforts need to be made to arrive at a consensus on the cut-off values for iron parameters that are acceptable for screening and research. Health promotion and intensive inputs to improve the diet of girls and iron supplementation in adolescence are required to redress nutritional deficits and, in longer term, to reduce anaemia in older women of reproductive age.

Need For The Study

Anaemia is a marker of general poor health in India. Many studies reveal that iron deficiency anaemia among pregnant women is the cause of most maternal morbidity and mortality. According to NFHS-3 (National Family Health Survey) report, 56 percent of women age 15-49 years are anaemic in India, which is also the highest in the world. In India, Assam is the highest prevailing state constituting 72 percent. (7) Considering the above statements, it is important to understand the level and vulnerability of anaemia among women during reproductive age groups. The present study is done to explore the factors, differentials and determinants of maternal anaemia.

II. Materials And Methods

The present investigation was conducted to find out the prevalence of anaemia among pregnant women attending ante-natal OPD units of GMCH, Guwahati, Assam. A total of 250 pregnant women were randomly selected. This area, Bhangagarh, is located in the suburbs of Guwahati. Baseline data regarding the socioeconomic status were collected using a performer and pooled together for analysis. Haemoglobin was estimated by cyanmethemoglobin method using the systronic photo colorimeter. The entire research was approved by the Research Committee of GMCH. Informed consent was obtained from all respondents. Data were analysed using SPSS 1 version.

III. Findings

Table 1 Demographic Characteristics Of The Subjects

Sl. No.	Characteristics	Ante-natal N = 250 F	%
1	**Age in years**		
	17-21	29	11.4
	22-25	91	36.4
	26-30	100	40.1
	Above 30	30	12.1
2	**Age at marriage**		
	13-21	85	34.7
	22-25	110	44.7
	26-30	44	18.2
	Above 30	11	4.4
3	**Age at first childbirth**		
	15-21	63	25.2
	22-25	108	43.2
	26-30	68	27.3
	Above 30	11	4.3
4	**Education**		
	Non-literate	07	3.0
	Below 10^{th}	90	36.2
	10^{th} Std to below graduation	113	45.1
	Graduate	36	14.3
	Post-Graduate	04	1.4
5	**Socio-economic status**		
	High (35-52)	07	2.9
	Middle (18-34)	80	31.9
	Low (1-17)	163	65.2
6	**Type of family**		
	Nuclear	70	27.9
	Joint	180	72.1

The sample characteristics of the ante-natal women are shown in **Table 1**.Data presented in **Table 1** indicate that 100 pregnant women were between 26 and 30 years of age.110 pregnant women got married between 22 and 25 years of age. Similarly, age at first childbirth of women was 22-25 years as per the modified socio-economic scale developed by Srivastava, 163 pregnant women belonged to low socio-economic status. Most of them (180) belonged to joint family. Around 113 pregnant women had education below 10^{th} standard to below graduation and post-graduation was only 4.

Prevalence of Anaemia and its Severity

The prevalence of anaemia was 50.4% among pregnant women (126 out of 250). Out of 126, 38 (30.44%) had mild anaemia (Hb 10 to 10.99 gm/dl), 74 (58.44%) had moderate anaemia (Hb 7 to 9.9 gm/dl) and 14 (11.12%) had severe anaemia (Hb < 7 gm/dl).

Further, the prevalence of anaemia was analysed in terms of demographic and biological variables among ante-natal women. The findings are presented in **Tables 3 and 4** respectively.

The prevalence of anaemia was 57.72% (17) among ante-natal women who were in the age group of 17-21 years followed by the age group of 30 and above and 22-29.

The prevalence of anaemia was 59.80% (7) among ante-natal women who got married below 18 years of age. This indicates that early marriage predisposes the risk for occurrence of anaemia in pregnancy. Higher prevalence of 54.36% (49) anaemia was seen among women with education below 10th standard . Even the prevalence of anaemia among post-graduate pregnant women was 33.33% (1). The prevalence of anaemia was 54.27% (89) among ante-natal women who belonged to low socio-economic status.

Table 2 Distribution Of Study Subjects By Severity Of Anaemia

Degree of Anaemia			
Mild N (%)	**Moderate N (%)**	**Severe N (%)**	**Total N**
38 (30.44)	74 (58.44)	14 (11.12)	126

Table 3 Prevalence Of Anaemia According To Selected Demographic Variables

Variables	Ante-natal N=250				
	Non-anaemic n=12		Anaemic n=126		
	f	%	f	%	Total
Age in years					
17-21	12	42.28	17	57.72	29
22-29	92	51.26	88	48.74	180
30 and above	20	49.25	21	50.75	41
Age at marriage (in years)					
Below 18	4	40.20	7	59.80	11
19-21	35	47.70	39	52.30	74
22-29	76	52.00	71	48.00	147
30 and above	9	52.30	9	47.70	18
Age at first childbirth					
Below 21	27	44.28	36	55.72	63
22-29	87	51.80	81	48.20	168
30 years and above	10	51.40	9	48.60	19
Education					
Non-literate	2	34.40	5	65.60	7
Below 10th	41	45.64	49	54.36	90
10^{th} and below graduation	58	52.06	55	47.94	113
Graduate	20	55.19	16	44.81	36
Post-graduate	3	66.67	1	33.33	4
SES					
High (35-52)	4	58.06	3	41.94	7
Middle (18-34)	46	57.56	34	42.44	80
Low (1-17)	74	45.73	89	54.27	163
Type of family					
Nuclear	34	49.0	36	51.0	70
Joint	90	50.19	90	49.87	180

Table 4 prevalence of anaemia according to biological variables

Variables	Ante-natal N=250				
	Non-anaemic n=124		Anaemic n=126		
	f	%	f	%	Total
Parity					
1-2 (low)	107	51.61	100	48.39	207
3 and more (high)	17	38.46	26	61.54	43
Spacing of children between 1^{st} and 2nd					
< 1year	17	51.95	15	48.05	32
1-2 year	9	46.93	10	53.07	19
> 2 years	28	47.77	31	52.23	59

Data presented in **Table 4** further reveal that the prevalence of anaemia was 61.54% (26) among ante-natal women who had high parity with more than two children.

Limitations And Caveats Of The Study

PCV, serum iron profile, folate levels and stool examination for occult blood and parasitic infection were not done, due to higher cost. Follow up of the pregnancy to see the maternal and foetal outcome especially during the labour, could not be done. Ideally subjects should be studied in a statistically selected random sample, so more studies are needed to identify the various determinants of anaemia in different population groups.

IV. Discussion

Anaemia in pregnancy continues to be a health problem. The overall prevalence of anaemia was 50.4 per cent among ante-natal women in the present study. It has been observed that the prevalence of anaemia was high (17) among younger age group of pregnant women i.e., below 21 years which indicates that the nutritional status of girl child is poor and little attention is paid to the correction of anaemia in the pre-pregnancy period. Very little is done to improve the nutrition of the young girl, the growing adolescent, the married women before her first pregnancy and between pregnancies and after pregnancy. In this study, low socioeconomic status, high parity, contributed significantly to the higher prevalence of anaemia in pregnancy. Apart from overall poverty, the health status of women in India not only reflects gender discrimination from birth but also their social and biological vulnerability both within society and the household.

Anaemia in pregnancy is an important preventable cause of maternal morbidity and mortality. It is enhanced by restrictions in food intake that deprives women of rich iron and proteins due to cultural taboos and beliefs. Several other less frequent but important causes which can exacerbate an anaemic state, must be considered. In addition to the nutritional factors that cause anaemia, chronic Fe losses due to parasitic infections such as hookworm and schistosomiasis (4% on history) may cause anaemia.(9) Worm infestation may be improved by including stool examination for every pregnant woman. Antihelminthic therapy could be given to infested women before conception as public health strategy to improve iron stores. Frequent use of NSAIDS may cause and exacerbate iron deficiency anaemia.(3) Fluctuations in appetite and nausea commonly experienced by pregnant women in the first trimester may have influenced reported dietary intakes.(9)

Hemolysis, renal, hepatic and pulmonary disorders are least common causes of anaemia in pregnant women. None of the women in this study had clinical or laboratory evidence for anemia which could be ascribed to these problems.(3)

These factors could be taken care by timely health education to adolescent girls regarding importance of literacy, delaying the age at marriage, family spacing, small family norm etc.(10) Although the policy of Anaemia Surveillance and focusing on the adolescent girls has been recommended by several authors it has rarely been implemented, probably because adolescents are less easy to reach than pregnant women. This situation is changing, however, because adolescent reproductive health is now an important item on international agendas, and governments are starting to draw up national policy guidelines to improve adolescent sexual and reproductive health. Nutritional information and supplementation should be included in these policies, and every effort should be made to link supplementation to other interventions reaching young girls. (11)

Despite a high prevalence of anaemia in our population, the tendency to use haematinic supplements is quite unsatisfactory (only 36%). Prophylactic iron supplements, in a dose of 65 mg of elemental iron per day from 20 weeks of gestation onwards is sufficient to prevent iron deficiency anaemia in mother. In another cross sectional study, most of the pregnant women consumed iron and folic acid but still anaemia was prevalent among 54.07 per cent of them. The reason could be poor absorption of iron as pregnant women took iron after breakfast. Literature also shows that tea and coffee prevent absorption of iron.(5)

Lower hemoglobin concentration is associated with a higher risk of poor pregnancy outcomes in both first and third trimesters. In addition, there is risk of LBW, SGA and related pregnancy complications.(12)

The Nutritional Anaemia Prophylaxis Programme of the government promotes the use of iron and folic acid tablets by all pregnant women. Unfortunately the tablets are not always available, there is poor accessibility to pregnant women, inadequate training of frontline health workers; and inadequate counselling of mothers. These are the major weaknesses of the programme. Similar observations are obtained by evaluation of the National Nutritional Anaemia Prophylaxis Programme, which showed no impact even after 15 years. Even with strong antenatal programmes and iron and folic acid supplementation for nearly 20 years there is no appreciable decline in anaemia.(2) Further studies on anaemia are needed from different parts of the country.

Operational research is needed to make iron readily available as well as mechanisms to motivate pregnant women to regularly take iron and folic acid.(2) The low compliance is particularly due to the side effects associated with iron preparations. (10)

The disadvantaged and undernourished Assamese women would be more likely to be anaemic, reflecting health disparities that are on the rise because of increasing urbanization and improvements in economic development. We also hoped to identify risk factors that would be helpful for program purposes to prevent anaemia among Indian women generally and Assamese women particularly. Our hypotheses related to socioeconomic status, suburban location and anaemia were partially supported. The direct effects of poverty that result in low income, limited education and insufficient diet have all been associated with poor health outcomes for the urban poor in developing countries. Despite greater opportunities for health care in urban areas, the urban poor are often more marginalized in their ability to access health services because of constraints in financial and administrative resources that are necessary to access the services in urban areas (Yesudian, 1988; Kakar, 1988; Griffiths & Stephenson,2001).

What have we learned that is helpful for program and policy makers in India? The 'bad news' is that many of the risk or protective factors are not amenable to change or rapid intervention. We believe this analysis strengthens the recommendation of Stoltzfus (1997) for a re-examination of policy on the international cut-offs to assess anaemia prevalence for purposes of surveillance and treatment. She argues that prevalence data should distinguish between 'any' anaemia (mild, moderate and severe combined) to report prevalence in all three degrees. The NFHS 2 in India allows an analysis by degree of anaemia and this provides a benchmark for program evaluation and for mobilizing programs to target interventions to women at most risk. (1)

The 'good news' is that combined food and iron supplementation programs would be most effective to address anaemia. Such schemes like 'Noa-boa', 'Mamoni', 'Majoni' & Aanganwadi programmes targeting the pregnant population, besides providing free IFA tablets and ANC check up in all government hospitals, also distribute free commodities like rice, dal on each ANC visit along with a cash reward of Rs 1000/- , if all ANC visits are regular, are now actively implemented by the state government of Assam. The real success of these programs are only when anaemia endemic is controlled – which is now under the test of time. Similar integrated programs for hookworm eradication, malaria prophylaxis, proper sanitation would be important for further reducing the burden of anaemia.

The results of our study are based on cross-sectional data with a moderate sample size of pregnant women enrolled in a clinical trial at a single hospital, so caution should be exercised when drawing conclusions, and the findings may not be representative of all urban Indian pregnant women.

V. Conclusion

It is a known fact that one of the objectives of public health is to reach and target the population at risk in providing better health care so as to achieve the goal of health for all. Operational research on how best to improve existing iron supplementation programs is needed (Yip, 1994). New and innovative strategies are needed, particularly those that improve the overall health and nutrition status of adolescent girls before they enter their reproductive years (Gillespie & Johnston, 1998; Kurz & Johnson-Welch, 1994; Kanani & Poorjara, 2000; Creed-Kanashiro et al, 2000). This will require tailored programs that target women in all socioeconomic groups and who live within both rural and urban areas, but particularly in need of intervention are the urban poor, who are a rapidly growing marginalized segment of the Indian population. (1)

Lets dispel the misconcept that little can be done now, as they say- ' IT IS NOW OR NEVER'.

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