## ORIGINAL RESEARCH ARTICLE

# Prevalence of Anemia during Pregnancy in the Women of Eastern Nepal

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**ABSTRACT**

Anemia is the commonest problem in pregnancy in developing countries. Hence, the present study was aimed to investigate the prevalence of anemia and to find out the correlation between hemoglobin concentration and other variables like age, severity of anemia, trimesters in pregnancy, etc. in Nepalese pregnant women of Biratnagar, Morang District. Hemoglobin (Hb) levels were used to estimate the incidence of anemia in these pregnant women, who were attended the Birat Hospital and Research Centre, Biratnagar, Nepal. Out of 364 subjects, 172 (47.25%) were diagnosed as anemic. The majority (68.60%) of these anemic pregnant women were mildly anemic whereas 29.06% were moderately and 2.32% were severely anemic. (WHO definition). Prevalence of anemia was higher in these pregnant women at the second trimester (51.1%) and also at the 20-35 years age group (62.79%).

**Key words:** Pregnancy, Hb Concentration, Anemia.

## INTRODUCTION

Anemia is the most common nutritional deficiency disorder in the world. WHO has estimated the prevalence of anemia in pregnant women in developed and developing countries, and that is 14% in developed and 51% in developing countries [1]. About one-third of the global populations (over 2 billion) are anemic [2]. Incidence of anemia in South Asian countries is highest in the world. WHO estimates that even among the South Asian countries, India has the highest prevalence of anemia. About half of the global maternal deaths occur due to anemia in South Asian countries. Many researches in different parts of developing countries have documented iron deficiency as the leading cause of death in pregnancy [3, 4]. The prevalence of anemia in pregnancy varies considerably because of differences in socioeconomic conditions, lifestyles and health seeking behaviors across different cultures [3, 4].

Anemia in pregnancy is considered as one of the major risk factors for contributing to maternal death in developing countries [4]. Hemorrhage, eclampsia and infections are being the three major causes of maternal deaths in Nepal [5]. Bonevik *et al* showed that prevalence of anemia is 62.2% (out of which 3.6% with severe anemia) in a study conducted in Kathmandu, Nepal [6]. Similarly, high prevalence (50.0%-60.0%) of anemia were noted in various studies conducted at different region of Nepal[7], in particular, one important study carried out[7] showed that prevalence of anemia in adolescent girls in Dharan, a town in eastern Nepal was 68.8%. Association of anemia with malaria and hookworm infestation has been shown earlier in various studies done across the globe [8]. Another study showed that the total iron needed during the pregnancy is about 1000 mg [9]. The daily requirements for iron as well as folate are six times greater for a woman in the last trimester of pregnancy than for a non pregnant woman. This need cannot be met by diet alone, but is derived at least partly from maternal reserves. In a well nourished woman, about half of the total requirement of iron may come from iron stores. When these reserve are low due to malnutrition and /or frequent pregnancies, anemia results. Keeping this view in mind we conducted this study on the population of Biratnagar in eastern Nepal. We considered different age group and trimester and its relation with the severity of the anemia.

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## MATERIALS AND METHODS

This study was conducted in Birat Hospital and Research Centre, Biratnagar, Nepal from the period of June 2011 to March 2012. Records with incomplete information are excluded from the study. Permission from the Head of institution and the department was taken. In this study, the efforts have been made to include all the patients who had come to BHRC for Antenatal care and delivered in BHRC as well. Not all patients who are coming for Antenatal care came for delivery also. Similarly not all deliveries in BHRC had regular Antenatal care in BHRC. So we included only those who came to Birat Hospital and Research Centre for Antenatal check up and came for delivery as well. A sample size of 364 subjects was investigated for estimation of Hb level by cyanmethemoglobin method and on the basis of the hemoglobin concentration, anemia is classified into three degree (WHO definition): mild degrees (9.0-10.9 gm %), moderate degree (7.0-8.9 gm %) and severe degree (<7 gm %).

## STATISTICAL ANALYSIS

The statistical software SPSS was used for data analysis. The mean value of hemoglobin was determined. Data were expressed as mean ± SD. Significance was determined by using the Student's t- test. Differences were considered significant if P<0.05.

## RESULTS

A total of 364 pregnant women samples were collected and analyzed for this study from June 2011 to March 2012. The age group for this study was considered from 15-45 years. (**Table 1)** shows that among the total pregnant women, 172 (47.25%) pregnant women were anemic whose mean Hb concentration was 9.3 gm % of blood which is statistically significant (P<0.05) compared to the Hb concentration of non-anemic pregnant women (Hb concentration is 11.5 gm %). Also, among these anemic pregnant women, majority (68.60%) of these women were mildly anemic, whereas 29.06% were moderately and 2.32% were severely anemic (**Table 2**). Further, (**Tables 2 & 3)** shows that the prevalence of anemia was higher in pregnant women at the second trimester (51.1%) and at the age group of 20-35 years (62.79%).

**Table 1: Hemoglobin concentration of anemic and non anemic pregnant women**

|  | Non anemic | Anemic |
|---|---|---|
| Number of patient | 192(52.75) | 172(47.25) |
| Mean ± SD | 11.5±1.2 | 9.3±0.92 |
| P value | P<0.05 | |

**Table 2: Comparison between degree of anemia and age group of pregnant women**

| Age in Years | Degree of anemia | | | Total |
|---|---|---|---|---|
| | Mild | Moderate | Severe | |
| 15-19 | 29 | 12 | 1 | 42(24.4) |
| 20-35 | 69 | 36 | 3 | 108(62.8) |
| > 36 | 20 | 2 | 0 | 22(12.8) |

**Table 3: Distribution of number of anemic and non-anemic pregnant women at different trimester of pregnancy**

| Trimesters | Anemic | Non-anemic | Total |
|---|---|---|---|
| First | 9 (5.2) | 52 (27.0) | 61 |
| Second | 88 (51.1) | 39 (20.3) | 127 |
| Third | 75 (43.6) | 101 (52.6) | 176 |

*Parenthesis indicates the percentage of anemic and non-anemic pregnant women at different trimester*

## DISCUSSION

Anemia is the common problem in female population which is understood that the occurrence of anemia is due to regular monthly menstrual blood loss. If we see anemia in non pregnant female, most common causes are due to excessive blood loss during menstruation, hookworm infestation, chronic nutritional deficiency and rarely malignancy. In pregnancy it is more severe because of increased demand and decrease in intake either due to nausea or a decrease in appetite or lack of knowledge, chronic diseases or due to poverty [10].

In this study population of Biratnagar area, the prevalence of maternal anemia was 47.25% (Table 1). Further analysis of results revealed that the majority of the anemic women observed were mildly (68.60%) anemic, whereas 29.06% were moderately and 2.3% were severely anemic (Table 2). Our study further revealed that anemia was mostly recorded at the age group of 20-35 years and those at the second trimester of pregnancy Tables 2 and 3. Results of our work corroborates well with the reports of WHO on the prevalence of anemia in developing countries [1]. Data of our study indicates that the prevalence of anemia in our study was closer to that recorded among the pregnant women of Venezuela (34.4%) which further supports our interpretation [9].

Our observation is quite in agreement with the earlier observation that iron deficiency is the commonest cause of anemia in developing countries and that is why WHO has emphasized on the need of epidemiological studies [11, 12]. WHO also has proposed that if the prevalence of anemia in a region is between 5% and 20%, appropriate interventions based on food diversification, food fortification, iron supplementation and controlling of infectious diseases should be considered [13]. As we see a lot of cases of anemia in developing countries, especially during pregnancy, public awareness

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comes to play the major role in the prevention of the causative factor of the disease.

## CONCLUSION

Continuing of daily iron supplementation program with folate and vitamin $B_{12}$ in the beginning of pregnancy and food aid programs towards pregnant women is advocated to reduce this problem. During pregnancy, efforts should be made towards early diagnosis and treatment of all anemic pregnant women before delivery. Qualified nutritionists should be integrated in the management of anemic pregnant women. Medical officers in charge of treatment should endeavor to do further investigation on anemic pregnant women to identify the etiology whenever possible. Technology for detection of anemia and its effective treatment should be made available and affordable and also effectively implement these facilities even in primary health care settings.

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