

Original Research Article

Prevalence and pattern of anemia in the second and third trimester pregnancy in Western Rajasthan

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ABSTRACT

Background: Anemia in pregnancy is related to maternal-fetal morbidity and mortality. In developing countries like India it is important to study prevalence and pattern of anemia in pregnancy especially in the region with higher maternal mortality rate like western Rajasthan. The main objective was to study the prevalence and pattern of anemia in second and third trimester pregnant females in western Rajasthan.

Methods: In this cross sectional study females with second and third trimester pregnancy were evaluated for presence of anemia with its morphological type and severity.

Results: 17,552 second and third trimester pregnant females were evaluated and prevalence of anemia was found 48.4%. The percentages of mild, moderate and severe anemia were 35.1%, 51.3% and 13.4% respectively. Most common morphological type was microcytic hypochromic anemia (51%) followed by normocytic normochromic anemia (32%), dimorphic anemia (13%) and macrocytic anemia (4%).

Conclusions: There is high prevalence of anemia in pregnant females. This warrants the need of proper prophylaxis and early diagnosis of anemia in pregnancy to minimize the maternal-fetal morbidity and mortality.

Keywords: Anemia, Pregnancy, Prevalence

INTRODUCTION

Anemia is a global public health problem, affecting both developing and developed countries.¹ WHO estimates that prevalence of anemia is 14% in developed countries, 51% in developing countries, and 65-75% in India.² In India, National Family Health Survey -2 in 1998 to 99 shows that 54% of women in rural and 46% women in urban areas are anemic.³ India contributes to about 80% maternal deaths in South Asia as estimated by WHO.⁴

Anemia during pregnancy is a major cause of morbidity and mortality of pregnant women in developing countries and has both maternal and fetal consequences. Anemia is primarily responsible for 20% maternal deaths.⁵ Maternal anemia associated with adverse pregnancy outcome such

as increased rates of maternal and perinatal mortality, premature delivery, low birth weight, low APGAR scores, hampered fetal physical growth, mental impairment and infant deaths etc.^{6,7} Anemia may worsen by postpartum hemorrhage and anemic patients are predisposed to puerperal infections. Both anemia and puerperal infections are leading causes of maternal mortality in developing countries.⁶

India became the first developing country to take up a National Nutritional Anemia Prophylaxis Program (NNAPP) to prevent anemia among pregnant women. NNAPP was initiated in 1970 during the fourth 5-year health plan with the aim of reducing the prevalence of anemia to 25%. However, high prevalence of anemia among pregnant women persists despite the availability

of this effective, low-cost intervention for prevention and treatment.⁸

With a maternal mortality ratio (MMR) of approximately 445 per 100,000 live births, the state of Rajasthan contributes significantly to India's burden of maternal deaths.⁹ So this study was conducted to assess prevalence of anemia among pregnant females in the state having high maternal mortality rate to improve the maternal and child health.

Aims and objectives

To study the prevalence and pattern of anemia in second and third trimester pregnant females in western Rajasthan.

METHODS

The present cross sectional study was conducted on the pregnant females in their second and third trimester who reported to department of Obstetrics and gynecology of a tertiary care institute for duration of 6 months. Pregnant females in first trimester were excluded because majority of the women were started attending ANC after 12 weeks of gestation.¹⁰

Full term pregnant patients who presented with labor pain were also included in this study and hemoglobin level was measured from pre-delivery samples. Blood samples were drawn and stored in tubes containing EDTA for complete blood count (CBC) of the blood samples.

The hemoglobin concentration was estimated by using five part differential cell counter machine. Hemoglobin level was categorized into mild anemic (10.0-10.9 g/dL), moderate anemic (7 -9.9 g/dL) and severe anemic (<7.00 g/dL) according to WHO criteria.¹¹

A peripheral smear was also made to study the type of anemia. The size of RBC was compared to the nucleus of small lymphocyte to label a cell as microcytic, normocytic or macrocytic and if the central pallor was more than one third of cell diameter, the cell was counted as microcytic. Simple tabulation and proportions were calculated.

RESULTS

Present study included 17,552 pregnant females in second and third trimester over a period of six months from January to June 2016. The prevalence rate of anemia was found 48.4% (8497 out of 17552 patients). Higher prevalence of anemia was found in second trimester (72.8%) in comparison of third trimester (47.9%) (Table 1). The hemoglobin concentration ranged from 1.7-15.5 gm/dl with a mean of 10.7 gm/dl. The percentages of mild, moderate and severe anemia were 35.1%, 51.3% and 13% respectively (Table 2).

Table 1: Trimester wise distribution of frequency of anemia.

Trimester	Total no. of cases	Total no. of anemic patients	Total (%)
Second	4354	3173	72.8
Third	13198	6325	47.9
Total	17552	8497	48.4

Table 2: Severity of anemia in pregnant females.

Grades of anemia	Total no. of patients	Percentage (%)
Mild (10-10.9 gm%)	2990	35.1
Moderate (7-9.9 gm%)	4360	51.3
Severe (<7 gm%)	1147	13.4
Total	8497	100

Morphological types showed that microcytic hypochromic anemia (51%) was most common anemia followed by normocytic normochromic anemia (32%), dimorphic anemia (13%) and macrocytic anemia (4%) in second and third trimester pregnant women (Table 3).

Table 3: Morphological type of anemia in pregnant females.

Types of anemia	Number of patients	Percentage
Microcytic hypochromic anemia	4333	51 %
Normocytic normochromic anemia	2719	32 %
Dimorphic anemia	1105	13 %
Macrocytic anemia	340	4 %
Total	8497	100%

DISCUSSION

Anemia remains a very common health problem among the women of reproductive age group and leads to high morbidity and mortality rates among females. Therefore, this study aimed to determine the prevalence of anemia in pregnant women in western Rajasthan.

The prevalence of anemia in this study among second and third trimester pregnant women was 48.4%. Although this study established a marked reduction in the prevalence of anemia in pregnancy when compared with previous study in the same region by Babita Bansal et al which had 84% prevalence of anemia in 2005-2006.¹² Lower prevalence is a favorable sign that may be contributed by various factors in this region like increased awareness and better health care facilities. But it is still much higher than the goal of 25% targeted by NNAPP as mentioned above.

The tenth five year plan has suggested a multi-pronged approach to combat anemia, which needs to be

implemented effectively.¹³ It includes, screening for anemia, treatment of anemic women, and availability of food fortification (wheat flour with iron and folic acid), milk, sugar and salt with iron to build long term iron stores which remains the key to reduce anemia.

In this study the prevalence of moderate anemia was found to be highest 51.3% followed by mild anemia 35.1% and severe anemia 13.4%. These results are close to the study done by Tyagi N et al which found the prevalence of moderate anemia as 61.0% followed by mild anemia 29.5%.¹⁴ Percentage of severe anemia is similar with the study of Bansal B et al (14.3%) and Wanjari SA (14.0%).^{12,15}

According to the WHO report that the commonest cause of anemia in pregnancy is nutritional i.e. iron deficiency.¹⁶ Morphological typing in current study showed that microcytic hypochromic anemia (51%) was most prevalent anemia supports WHO report. Similar findings were reported in the study by Sawe (prevalence of 53.6%).¹⁷ Other morphological types reported as normocytic normochromic anemia, dimorphic anemia and macrocytic anemia as 32%, 13% and 4% respectively. In our study highest prevalence of anemia was found in second trimester (72.8%). Similar observations were seen in 2001 by Rajaratnam in his study which quoted 70.2% prevalence in IInd trimester.¹⁸ The high prevalence indicates the need for iron supplementation as early as possible starting from the fourth month of pregnancy.

This study concludes that anemia is a significant problem of pregnant women. The approach of treating anemia should be an early approach so that it should not progress to severe stage. Proper antenatal care, early detection of anemia, good nutrition and iron supplementation throughout the pregnancy can help achieve the goal of a healthy mother and healthy baby.

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