

Research Article

Frequency of anemia in pregnant women of different age groups at Quetta: A hospital-based cross sectional study

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Abstract

The present study was conducted with the aimed to determine the frequency of anemia and lack of hemoglobin in human pregnancy at Bolan Medical College Hospital Quetta during 2017. As many as 625 pregnant women patients were examined, of these 350 were found anemic. Blood samples of randomly selected three hundred and fifty pregnant women of age group 17-44 years were analyzed, and was classified under first trimester (21), second trimester (58) and third trimester (271). The data was analyzed to estimate the frequency of anemia during pregnancy ranging from mild: 288 (46.1%) to moderate: 54 (8.6%) and severe: 8 (1.3%). Findings revealed that anemia was found to be prevalent in third trimester (271) as compared to the second (58) and first (21) trimester of pregnancy. Chi-square test was applied at 5% level of significance to check the association between age groups, parity and gestation age (G age). Significant association was found with anemic level at p-value <0.001 in age group and G age, whereas parity was not found associated with anemic level at 5% level of significance. The present study revealed that overall prevalence rate of anemia was 56% which indicated high prevalence of this disease in the region. The study concluded that pregnant women are at high hazard of blood anemia. Fresh balanced diets rich in iron, folic acid and vitamin B12 are recommended for their health and fine growth of developing baby.

Keywords: Anemia; Frequency; Gestation-age; Hemoglobin; Parity; Quetta

Introduction

Anemia is common hematological problems in pregnancy have an impact on the hemoglobin (Hb) concentrations. It has been a major public health concern over the past few decades [1]. Lack of iron is known to be the most common nutrition deficiency other than folic acid and vitamin B12 [2]. Anemia

is defined by the Centre for Disease Control and Prevention (CDC) and World Health Organization [3] as Hb level >11gm/dl. When Hb% is >7.0gm/dl considered severe, if 7.0 to 9.9gm//dl (moderate), and mild when Hb% falls between 10.0 to 10.9 gm/dl. Globally, the poor countries and underprivileged groups suffer the most [4].

The highly affected population groups in developing countries are pregnant women (56%), school age children (53%), non-pregnant women (44%), and preschool children (42%) [5].

The world Health Organization [6] figured anemia prevalence among pregnant women at 41.8/% with the highest rate of incidence (61.3%) found in pregnant women in Africa, and (52.5%) among South East Asia. Africa is the most affected region among pregnancy ratio 17.2 million, which corresponds to around 30% of all maternal deaths. Anemia in pregnancy may also lead to premature births, low birth weight. Fetal impairment and kid's death [7].

Anemia is most prevalent in Asia. About half of all the anemic women live in the Indian subcontinent where 88% of them develop anemia during pregnancy [5]. It is associated with poor perinatal outcomes, especially in developing countries. Several of the studies have added to the outcome including one done at Aga Khan University Hospital (AKUH) in 2001-2002 [8]. In Pakistan, the prevalence of anemia among ever-married women aged 15 to 44 is reported to be 26% in urban areas and 47% in rural Areas. The prevalence of anemia among pregnant women living in urban areas is similar, ranging from 29% to 50% [9]. The present study was designed to determine the anemia prevalence and to analyze Hb concentration level as well as associated factors among different age groups pregnant females at BMC hospital, Quetta. There has been one study on prevalent type of anemia based on small sized sample conducted at different locality in this region of the province [10]. Therefore, the present study is being under taken to assess the burden of this problem in Quetta, so that effective measures can be taken to treat this condition and reduce morbidities associated with it.

Materials and methods

Area of study

The present cross-sectional study was carried out during March 2017 to May 2017 at Bolan Medical Complex Hospital (BMCH) Quetta, Balochistan province, Pakistan to determine the prevalence of anemia and to estimate the level of hemoglobin and association of the various factors with anemia in pregnant women. The BMCH (30.1908° N, 66.9739° E) is the largest hospitals of the province comprise on 750 beds, situated in the western edge of the capital city and provides medical care to the majority of the inhabitants.

Sampling size and procedure

A sizable sample of 625 pregnant women of different age groups (17-44) was collected randomly in the present study. Out of 625 hospital based sampling, 350 pregnant females were diagnosed by the consultant Gynecologist with anemia. All pregnant women with pre-diagnosed anemia in their 1st, 2nd and 3rd trimester were included in the study. All women were informed, that information would be used for only research purpose. Ethical approval for the study was obtained from the Medical Superintendent (MS) and ethical committee of Bolan Medical Complex Hospital.

Blood sample collection

Blood samples were obtained with the consent of each selected participant (pregnant women) in the vials containing anti-coagulant. The sample blood was analyzed for hemoglobin (Hb%) level was estimated by Sahli's Method of hemoglobin estimation. Hb level below 11 gm/dl (WHO) was tagged as anemia during pregnancy and classified as mild (10.0-10.99 g/dl), moderate (7.0-9.9 gm/dl), and severe (<7.0 gm/dl) anemia.

Data collection

Pretested-Performa was developed with the help of the concerned consultant Gynecologist for the study of the anemic pregnant women reporting in the Obstetric/ Gynae OPD. The pretested-Performa was

filled by the principle investigator. The outdoor patients Department (OPD) session was conducted weekly on every Wednesday and Friday. The data was collected over a period of Six (06) week and were checked for error. The collected data then were entered in SPSS 20.0 after proper coding of variables to tie the results.

Statistical analysis

The association between anemia in respondent pregnant women and associated factors like age, parity, gestation age, and trimester was also analyzed through cross tabulation using Chi-square test. Mean or median, SD and SD-error levels were thus calculated. The p -value of <0.05 was taken as significant.

Results

Among the pregnant women (625) recruited for the study, the overall prevalence of anemia observed was 56%. The ratio of mild, moderate, and severe anemia was found to be 46.1%, 8.6%, and 1.3% respectively among 350 adult females. Hence mild anemia was higher in terms of prevalence than other degree of severity. Data in table 1 indicated that women aged between 31-40 years were more anemic (62%) than women lied between 17-30 years determined less anemic (41%). The observed difference was found to be highly significant ($P < 0.0001$) (Table 1). While only 14% women above 40 (41-44) years of age were observed to be suffering from anemia. Variation in hemoglobin level was observed, minimum level of Hb detected was 5.3 gm/dl, and highest was 10.9 gm/dl (Figure 1). Hb level of majority of the women (75%) were found between 8.5-10.9 gm/dl. Only 3% of the women Hb levels were in range of 9.5-10.7 gm/dl, 22% were in range of 8.0-8.6 gm/dl.

The correlation between hemoglobin (Hb) and age was examined, it revealed a positive correlation between them as there correlated value is -0.145. The significance p -value is 0.007 is less than 0.01. The correlation

between Hb and parity was examined, it revealed a negative correlation between them as there correlated value is -0.046. The significance p -value is 0.393 is greater than 0.01. Positive correlation between Hb and gestational age (Gage) was also found between them as there correlated value is 0.069. The significance p -value is 0.199 is greater than 0.01. Data in table 2 indicated the association between age groups, parity and Gage with anemic level. Age group and gestational age showed significant association statistically in term of severity of anemia (p -value < 0.001), whereas the parity was not found associated with ratio of anemia at 5% level of significance.

Discussion

Anemia in pregnancy remains a major health problem worldwide, with an estimated 41.8% of pregnant women being diagnosed with anemia at some point in their gestation [11]. WHO [12] reported 52% of the pregnant, and around 35% of the other women are anemic in developing countries. Prevalence of anemia among pregnant women (%) in Pakistan was reported at 51.3 % in 2016, according to the World Bank collection of development indicators, compiled from officially recognized sources. A study conducted in Pakistan reported 35-40% urban and 43-47% village women aged between 15-44 year suffered from anemia, poor diet and deficient iron level was accounted for its cause during pregnancy [13].

In the present study frequency of anemia was 56% among 620 pregnant women of district Quetta (Figure 2). Out of 350 anemic women, 46.1% were mildly anemic, 8.6% and 1.3% were noted as having moderate, severe anemia (Figure 3). Hemoglobin level decreases due to increase in plasma level of blood during pregnancy [14]. In current study, lowest Hb level (5.3 gm/dl) was observed known to be alarming in pregnancy (Figure 1). Average Hb level ranged between 8.5-10.9 gm/dl found in majority of the

women. The present study were also found that pregnant women aged between 31-40 years were more anemic than between 17-30 years old, it was more prevalent 271 (43.54%) in the third trimester (29-40 week) as shown in table 1.

Anemia frequency in our study was lower than those reported from different parts of the country such as 96% in pregnant women of Multan, 75% in Faisalabad, 73% in Lahore, and 58.5% in Karachi respectively [15-18]. The later study showed severity of anemia as 80% mild, this is ever higher than that reported by other studies from Pakistan. However, unlike moderate anemic level (8.6% vs 15%) our findings are close to the prevalence of severe level of anemia such as 1.3 % vs 2% respectively. Even though the present study showed 56% anemia frequency among the studied pregnant women, this is higher than 53.0% observed in Peshawar [19], 48.6% in Rawalpindi [13], and 24% in Karachi [20].

The present study is comparable with other studies done in Pakistan and especially in Khyber Pakhtoonkhwa (KPK) and Sindh provinces where 76.7% prevalence of anemia was recorded in distinct Mardan with 68.3% mild, 29.1% moderate, and 2.6% severe anemia [21]. Our finding is to some extent close to this study regarding the severe degree of anemia i-e 1.3% vs 2.6%. Studies conducted in Abbottabad, Kohat and Karak districts (KPK) showed anemia prevalence in pregnant women to be 58%, 66.6%, and 67.6% respectively [22-24]. Our study is

similar partly to the former study in terms of prevalence (56% vs 58%), but due to large subject size (625 vs 100) our study is more genuine. In Hyderabad (Sindh) 90.5% anemia prevalence was reported with observation that 75% , 14.8% cases of anemia were mild and moderate, severe anemia was lower (0.7%) in this study [8] than the 2% to 7% reported for developing countries by WHO [25].

The ratio of anemia in pregnancy in other developing countries ranges from 35% to 81% [25-29]. Similar high rate of anemia (87%) among 4775 pregnant women was found in a large study [30] conducted in India followed by (86%) in Tanzania, (74%) Nigeria, (46%) Indonesia, (47%) Philippines, (48%) in Bangladesh [31], (38.4%) in Malaysia [4], (43.2%) in Vietnam [32] and (58.9%) in Nepal [33]. More than half, 328 (56.8%) pregnant women were anemic from the total (577) studied in Gode town, Eastern Ethiopia [34]. This finding is in line with our study where 350 (56%) anemia was determined in pregnant women. Recent statistics shows a prevalence of around 45% of Hb% (Iron) lacking anemia in Pakistan, which is quite high realizing the failure of public health measures to control it [15]. According to WHO [25] statistics, it has been found that more than one-fifth of women in Pakistan suffer from anemia. At country level, awareness exists regarding this lasting health problem in the country as verified by several regional surveys [1].

Table 1. Level of degree of anemia among pregnant women of different age groups

Age groups (years)	Anemic Level			P-value
	Severe	Moderate	Mild	
Age				
17 – 30	4 (3%)	16 (13%)	103 (84%)	0.0001
31 – 40	1 (1%)	22 (12%)	162 (87%)	
Above 40	3 (7%)	16 (38%)	23 (55%)	
Parity				
P0 – PG	0 (0%)	4 (17%)	20 (83%)	0.599
P1 – P4	5 (4%)	18 (14%)	108 (82%)	
> P4	3 (2%)	32 (16%)	160 (82%)	
Gestational Age (weeks)				
1 st Trimester(0 – 21)	1 (5%)	3 (14%)	17 (81%)	0.090
2 nd Trimester(13 – 28)	3 (5%)	14 (24%)	41 (71%)	
3 rd Trimester(29 – 40)	4 (1%)	37 (14%)	230 (85%)	

Table 2. Analysis of variance for hemoglobin (Hb) against Age groups, Parity and Gage

Age	Low age	Moderate age	Last age	Significance
	9.74 ± 1.07 ^a	9.99 ± 0.79 ^b	8.91 ± 0.99 ^c	<0.001
Parity	Group 1	Group 2	Group 3	
	9.73 ± 0.96	9.67 ± 1.11	9.84 ± 0.88	>0.05
G Age	Low	Medium	High	
	10.02 ± 1.08 ^a	9.30 ± 1.18 ^b	9.77 ± 0.98 ^a	<0.001

Different superscripts at each row mean significantly different

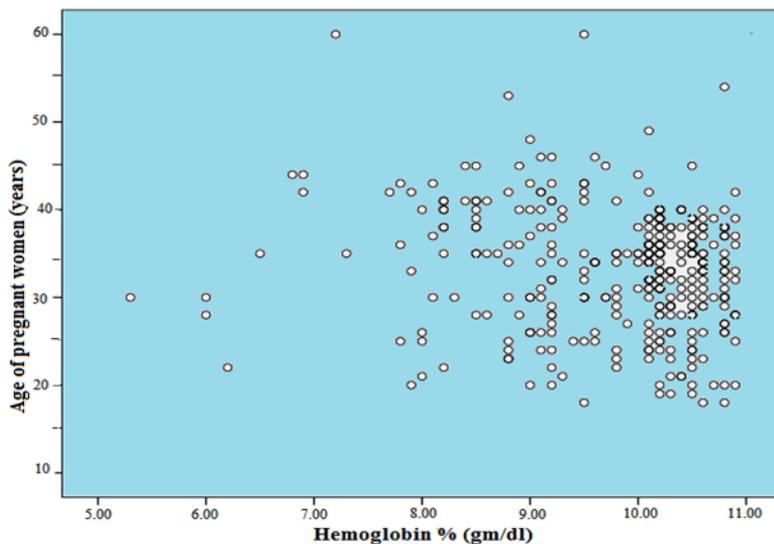


Figure 1. Association of Hemoblobin (Hb%) with age of pregnant women estimated in the present study in 2018

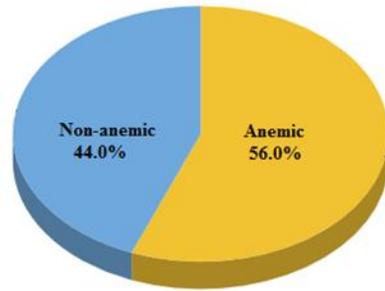


Figure 2. Distribution percentage of anemia assessed among pregnant women in the present study during 2018

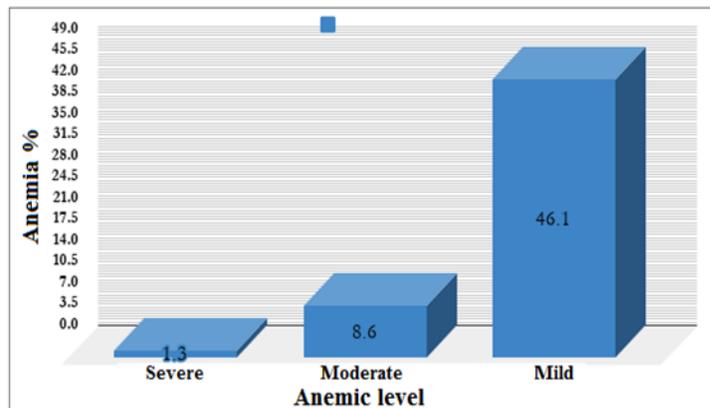


Figure 3. Degree of anemia severity among pregnant women determined in the present study during 2018

Conclusion

In the light of results obtained in this study it is concluded that anemia prevalence among pregnant women was high compared with pregnant women in other areas of Pakistan. Multiple factors like age, parity, and diet can determine the stores of iron in the women of child bearing age group. Trimester of current pregnancy, age, parity, Hb frequency were found to be significantly associated with anemia. Iron intake and special care during late pregnancy are recommended to reduce anemia. Further research on risk factors of anemia, which include rural residents, should be conducted to strengthen and broaden these findings.

Authors' contributions

Conceived and designed the experiments: A Bibi & A Kakar, Performed the experiments: A Bibi & F Shahwani, Analyzed the data: F Iqbal & A Kakar, Contributed reagents/materials/ analysis tools: F Iqbal & A Bibi, Wrote the paper: Kakar.

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