Status of Iron Deficiency Anemia among Reproductive Age Women in Quetta, Pakistan

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ABSTRACT:

Objective: Anemia, which is characterized by the deficiency of red blood cells / hemoglobin in the blood, is one of the most prevalent health problems in developing countries in females leading to risk of impaired cognitive development and physical growth which may ultimately lead to higher rates of mortality and morbidity.

In low-income countries, 56% of pregnant women get iron deficiency anemia, compared to 18% in high-income nations. A study reported that during the period 2010-2011 prevalence of anemia in the Pakistani women of reproductive age was recorded 50.7% and among them 49.3% were belonging to Balochistan. The current study aimed to assess the status of anemia of women of reproductive age in Quetta, Balochistan. **Methodology**: It was a cross sectional study carried out on women between the age 15-49 years. The reference values were taken according to WHO Guidelines to determine the anemic status. The samples were collected after consent with the help of trained lady health visitors. Data was analyzed on SPSS 20 and Microsoft Excel 2010.

Result: Results showed that 100 (23.53%) of the female population were found to be anemic. Most of them 54 (12.70%) were found with moderate anemia. Collectively highest number of females with anemia were found between the age of 20-40 years.

Acceptance: 20 October 2025 | Publication: 20 November 2025

MedinsideHub: Journal of Clinical Oncology (JCO)

Conclusion: Almost one fourth of the female population in Quetta have been found with iron deficiency anemia which is quite high in terms of percentage. There is a need to introduce strategies to address this problem through iron fortification and supplementation programs.

Keywords: Anemia, red blood cells, cognitive development, impaired.

INTRODUCTION:

Iron deficiency is the most common cause and responsible for majority of the cases of anemia. Anemia, which is characterized by the deficiency of red blood cells/ hemoglobin in the blood, is a global public health concern, with alarmingly high prevalence of around 9% in the developed countries and ever higher (43%) in developing countries(1, 2). Anemia in women of reproductive age may have serious consequences which may cause to elevate the risk of impaired cognitive development and physical growth which may ultimately lead to higher rates of mortality and morbidity(3). In low-income countries, 56% of pregnant women get iron deficiency anemia, compared to 18% in high-income nations. It is linked to a range of detrimental effects, including preterm birth, low birth weight, prenatal mortality, and maternal death from severe anemia (4). It is frequently asserted that anemia is primarily caused by iron deficiency (ID) and Iron deficiency Anemia (IDA) is one preventable cause of anemia. This study aimed to assess the prevalence of iron deficiency anemia among women of reproductive age in Quetta city.

MATERIALS AND METHODS:

It was a cross-sectional study that was conducted in 2018-19.

Study Population

The women of reproductive age from 15 to 49 years old were included in the study in Quetta.

Sample size

Samples of 425 women were randomly collected based on convenience sampling.

Data Collection

The study was conducted on a cross section of the target household. The data for this study was collected from the randomly selected households/women by house-to-house visits with the help of Lady Health Workers (LHWs) after formal consent from the participants.

For hematological studies about 5ml of blood was drawn from the cubital vein. Blood was collected in vacationer tubes containing EDTA. Hematological parameters included hemoglobin (Hb), Mean Corpuscular Volume (MCV), and Red Cell Distribution Width (RDW%) and were determined by using cell counter (CELL-DYN Emerald (Serial No. S 031114-005844 Ref.09H39-01, USA) within 24 hours of collection. Commercial kits including lyse (Series Lot 757829 Ref. 09H47-02) and diluent (Series Lot. 770712. Ref.09H48-02, USA) were used according to manufacturers' instructions.

RESULTS:

Table 1 Demographic Characteristics of the Population

Demographic Characteristic	**Frequency (%)**
Age (years)	
15-19	68 (16)
20-24	63 (14.8)
25-29	65 (15.3)
30-34	69 (16.2)
35-39	67 (15.8)
40-44	48 (11.3)
45-49	45 (10.6)
Status of Literacy	
Illiterate	262 (61.6)
Literate	163 (38.4)
Monthly Household Income	
Up to 10000	333 (78.4)
More than 10000	65 (15.3)
More than 25000	27 (6.4)
Educational Level	
Primary	28 (6.6)
Matric/Madrassa	79 (18.6)
Graduate	48 (11.3)
Post Graduate	8 (1.9)

Table 2 Prevalence of Iron Deficiency Anemia (Age wise distribution) of reproductive age women residing in the municipal limits of Quetta

Age Groups	**Anaemic** Frequency (%age)	**Non Anaemic** Frequency (%age)
15-19	13 (3.05)	55 (12.94)
20-24	17 (4.00)	46 (10.82)
25-29	16 (3.76)	49 (11.53)
30-34	14 (3.29)	55(12.94)
35-39	19 (4.47)	48 (11.29)

40-44	10 (2.35)	38 (8.94)
45-49	11 (2.58)	34 (8.00)
Total	100 (23.53)	325 (76.47)

P>0.5 non-significant association between age and IDA

Table 3 Level of Severity based status of Iron deficiency anemia (age group wise distribution) in the reproductive age women residing in the municipal limits of Quetta

Age Group	**Mildly Anaemic** Frequency (%age)	**Moderately Anaemic** Frequency (%age)	**Severely Anaemic** Frequency (%age)
15-19	3 (0.70)	8 (1.88)	2 (0.47)
20-24	8 (1.88%)	8 (1.88%)	1 (0.23)
25-29	4 (0.94%)	12 (2.82%)	0 (0.0%)
30-34	7 (1.64%)	5 (1.17%)	2 (0.47%)
35-39	9 (2.11%)	10 (2.35%)	0 (0.0%)
40-44	5 (1.17%)	4 (0.94%)	1 (0.23%)
45-49	3 (0.70%)	7 (1.64%)	1 (0.23%)
Total	39 (9.17%)	54 (12.70%)	7 (1.64%)

Reference Range (5)

Non Anaemic: 12.0 g/dl or higher

Mild Anaemic: 11.0-11.9 g/dl

Moderate Anaemic: 8.0-10.9 g/dl

Severe Anemia: lower than 8.0 g/dl.

Table 4 Hematological Data (mean ±SD) of Iron deficiency positive reproductive age women residing in the municipal limits of Quetta

Age Groups	**Hb[1]** (g/dl)	**MCV[2]** (fl)	**MCH[3]** (pg)	**MCHC[4]** (g/dl)	**RDW[5]** (%)
15-19	9.60±1.58	70.26±11.33	22.63±4.47	30.12±6.21	15.81±5.02
20-24	10.52±1.33	73.51±13.18	24.10±6.11	32.84±5.29	15.73±6.46
25-29	10.52±1.01	78.29±14.04	25.49±5.08	32.57±2.45	16.62±4.65
30-34	10.45±1.29	77.11±13.82	23.51±4.41	30.84±4.26	14.45±5.36
35-39	10.89±0.68	70.78±15.27	23.76±4.73	32.86±2.68	17.35±7.80
40-44	10.22±1.77	69.25±16.19	21.56±5.28	31.17±1.87	18.22±4.56
45-49	10.30±1.24	69.59±9.81	22.42±2.69	32.35±1.94	15.41±3.55
Overall	10.36±0.37	72.68±3.43	23.35±1.19	31.82±1.02	16.23±1.17

Haemtological values normal reference range for female (5)

Hb[1] = Haemoglobin (>12.0) g/dl;

MCV[2] = Mean Corpuscular Volume (87±7) fl;

MCH[3] = Mean Corpuscular Haemoglobin (29±2) pg;

MCHC[4] = Mean Corpuscular Haemoglobin Concentration (34±2) g/dl

RDW[5] = Red Cell Distribution Width (13±1.5%)

DISCUSSION

Iron deficiency anemia (IDA) among women is a global issue but women are affected the most and it is increasing tremendously in developing countries (6). In this study, results showed that in Quetta, which is the capital of Balochistan province, considerably high number n=100 (23.53%) of women were affected by IDA. Bhutta (7) reported that during the period 2010-2011 prevalence of anemia in the Pakistani women of reproductive age was recorded 50.7% and among them 49.3% were belonging to Balochistan(7). WHO Global Database of Anemia also suggests of similar prevalence between 1993-2005 (8). In this regard reports from different countries including Jordan, Brazil, Ethiopia, Uganda, India and Nepal reported the prevalence of anemia at 37.3%, 12.3%, 23.2%, 24%, 53.3 % and 12% in respectively in mentioned countries (9-12). Therefore, the results of this study are inline with the globally reported incidence of iron deficiency anemia in LMICs (13, 14). The results of this study are further endorsed by a recent study of Kinyoki (13) which reported that during the year 2019 prevalence of anemia among the women of reproductive age was globally 30.1%. He reported that with special reference to LMICs, dietary iron deficiency was the highest-ranking condition (13). In reference to a LMIC the key contributing factor to IDA is the low socioeconomic status along with other confounding factors that aggravate the scenario.

In this study the anemia was further determined on the basis of the severity according to the WHO categorization of anemia based on its severity. The results of present study revealed that in the municipal limits of Quetta 9% women of reproductive age were mildly anemic, 13% were moderately anemic and 2% were severely anemic. There has been a similar finding by Lilare & Sahoo (15) . They collected a base line data from January 2014 to December 2014 from Mumbai with reference to women of reproductive age and inferred that 37.1% were mildly, 9.5% moderately and 2.9% severely anaemic according to WHO classification. Similar findings have been reported in other studies as well (16) (17). The

IDA can be attributed to the different factors such as geographical, socioeconomic, cultural and dietary (11, 16). Pakistan being a LMIC with poor socioeconomic indicators and dietary patterns is prone. Low literacy rate of the population is another factor that adds to the severity of IDA according to the findings of other studies. (6, 18-20).

The data of present study regarding Hb, MCV, MCH, MCHC values and RDW percentage of women positive IDA showed decrease of various degree in Hb, MCV, MCH and MCHC values and a simultaneous increase in RDW percentage than the normal range. The above mentioned haemtological parameters are directly influenced in IDA, where only value of RDW increases, whilst the Hb, MCV and MCH decrease and variation in these parameters is considered as a good indicator of early IDA detection (21). RBC distribution width in combination with other haemtological parameters is also considered as a good tool for the differential diagnosis of IDA with thalassemia.

As reported in present study that the majority (76%) of the respondents were non-anaemic and those who were found to be anemic had mild or moderate levels of anemia. It could be attributed to several factors such as their dietary patterns, habits and lifestyle as Quetta city is dominated by Pashtun ethnic group. Similar findings were reported previously where more than 90% of population were anaemic except Pashtun population (22). Similarly, National Nutrition Surveys (1987 and 2001–02) findings are also in agreement where only 6.9% anemia among pregnant and 31.8% anemia among lactating women in the North West Frontier Province (Now KPK) of Pakistan was recorded, and this province has also Pushtoon ethnicity in majority.

Pakistan is ranked among LMIC and the province of Balochistan is identified with lowest Human Development Index nationally (23). With almost one fourth of the population with Iron Deficiency Anemia, as indicated

through results of the present study, the risk of women undergoing post-partum haemorrage and blood loss must be considered alarming to undertake in depth investigations and preventive steps to ensure that no loss of life occur during childbirth. Infants born to women with malnutrition and Iron Deficiency Anemia are also at risk due to the low birth weight (24). Therefore, to ensure that mortality during pregnancy and birth do not occur and it does not incur any further burden on the health facilities of an already burdened province (25, 26).

CONCLUSION

This study concludes that 23.53% of the women of reproductive age were anemic in the sampled population in Quetta, Pakistan. This calls for education and awareness programs at public level. Further there is need for food fortification programs to address the already existing issue. Moreover, there is need for further investigations in other parts of the province to ascertain the overall status of Iron Deficiency Anemia in order to develop and deploy comprehensive strategies to tackle this important issue.

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