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Prevalence of anemia in pregnant women in district Karak, Khyber Pakhtunkhwa, Pakistan

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Abstract

Anemia is one of the most common nutritional public health problem in both developing and developed countries. A total of 210 blood samples were taken from pregnant women of district Karak, Pakistan. The blood sample was collected in EDTA (Ethylenediamine tetraacetic acid) tubes from different gynae ward, health maternity centres by experts. Questionnaires were also filled at the time of blood collection. Hemoglobin (Hb), hematocrite (Hct), Mean Corpuscular Volume (MCV), Mean Corpuscular hemoglobin concentration (MCHC), white blood cell and red blood cell (RBC) was determine by automatic hematological analyzer model Symex Ks-21 having two reagents, cell pack and Stromatolyser-wwt 500 ml. The prevalence of anemia in pregnant women was high in Tehsil Banda Daud Shah (82.8%), Takht-e-Nasrati (64.3%) and Karak (55.7%). The results showed that percentage of anemia was higher in ruler areas as compared to urban. The incidence of anemia was more at the age of 30-37 years (72.75%). According to trimester wise distribution, the percentage of anemia was more in third trimester (81.9%) than second (61.3%) and first (58.6%). In illiterate women the anemia percentage was higher than educated. The result was highly significant (p = 0.0085).

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Introduction

Anemia is a blood disorder in which Hemoglobin (Hb) concentration is low than the normal value and thus the oxygen carrying capacity of Red blood cell become affected. The blood composition is 55% blood plasma and 45% blood cell (White blood cell, Red blood cell and Platelets). Anemia is one of most common nutritional public health problem in both developing and developed countries (Abbasi *et al*., 2013)**.** Anemia may be due excessive blood loss (Hemorrhagic anemia), red blood cell (RBC) destruction (Hemolytic anemia) and less production of RBC (hematopoietic anemia) (Sifakis and Pharmakides, 2000).According to WHO the anemia is defined as if the Hemoglobin status is low from the following cut off value for the pregnant women is Hb < 11 g/dl.The cutoff point for Mild anemia are (10.0-10.9 g/dl), Moderate (7-9.9 g/dl) and severe (< 7 g/dl) (Alem *et al*., 2013; Killip *et al*., 2007).There are multiple cause of anemia but the most common is iron deficiency. Iron deficiency anemia is one of the common nutritional anemia. The major factor which cause iron deficiency anemia is intake of insufficient iron containing food, more iron requirement at some stage of life such as pregnancy for fetus development and children for rapid growth and menstruation , parasitic infection and reduce iron utilization due to infection and vitamin A deficiency. The some other nutritional anemia causes by folic acid, vitamin C, vitamin B_2 and B_{12} and copper (Ahmed, 2000). Approximately 1.3 billion people suffer from anemia The most affected group is pregnant women (Alem *et al*., 2013)**.**In pregnancy the most common cause of anemia is iron deficiency. Approximately half of the population in developing countries are anemic (mostly children and pregnant women) (Hercberg *et al*., 1992). The prevalence rate in different groups are: pregnant women (50%), infant and children having age 1-2 years (48%), School age children (40%), non pregnant women (35%), adolescent (30-55%) and pre-school children (25%) (Allen and Gillespie, 2001).The prevalence of anemia is high in both developing and industrialized countries. it has been estimated that 35% to 75% (56% average) women are anemic in developing countries and 18% in industrialized countries, 43% of non pregnant women in developing countries and 12% in developed region (WHO, 1992). The incidence of Anemia in Central Asia (india) is high 88% (Jaleel and Khan,2008; Brabin *et al*., 1998). It has been recently estimated that 56.4 million pregnant women are affected from anemia during 1993-2005 (De Benoist *et al*., 2008). The percentage of anemia in pregnant women of South east China was 33.6% from 1993-2005. This prevalence increase from first <second<third trimester. The incidence of anemia was high in villagers, less educated and higher gravidity women. This percentage reduce from 1993 (53.3%) to 2005 (11.4%) (Jin *et al*., 2010). 40% to 60% maternal death in developing countries occur due to anemia. It is also associated with low birth weight, child mortality, preterm deliveries, and mental disability of child (Lozoff *et al*., 2006). The percentage of anemia in Kohat (Pakistan) 66.6 percent in pregnant women, 55.87 percent in non pregnant married women and 48.4 percent in married young girls (Riaz *et al*., 2013).It has been estimated that approximately 150 million deliveries occurs annually throughout the world. Out of these 60,0000 women die from pregnancy related complication and child birth and 40%- 60% maternal death occurs in developing countries (Bhatt, 1997). Approximately 5 85,000 women die per year from pregnancy complication and 99% of them in developing countries (Bhsoale *et al*., 2011). Looking to hazardous of iron deficiency anemia (IDA) in the pregnant women, the current study was designed to investigate the rate of low iron causing anemia in pregnant women in association with socio economic status, education, trimester and dietary intake in district Karak Khyber Pakhtukhwa (Pakistan). This study will provide a base for the Anemia prevalence in the whole region.

Materials and methods

There are 25 districts in Khyber pakhtunkhwa.This study was carried in district in one of Southern District (Karak) of Khyber pakhtunkhwa Pakistan. the total population in the district Karak is 457,000. The Rural and Urban ration is 72:28. Population living below poverty is 26%.

To assess the prevalence of anemia, the whole district was divided into three cluster. Tehsil Karak, tehsil Takht-E-Nasrati and tehsil Banda Dawood Shah. From each cluster 70 blood samples were collected from pregnant women. Thus a total of 210 pregnant women were collected. A questioner was designed for this purpose. Some other research method like observation, interviews from pregnant women by visiting of health maternity center, hospital, and from private LHV center by female nurse. The questionnaire tell us about age, sex, social class, education, use of unfortified cow milk, black tea intake, vitamin supplementation drugs and dietary intake along with pregnancy order, time, and disorder. To know Scio economic status of the people, the population was divided into three classes. Lower (<15000 PKR), Middle (=15000-20000 PKR) and Upper class (20000> PKR), if the people do not tell about their income. Their life status and facility was observed.

Blood sampling

The blood samples were withdrawn from anticubital vein by means of simple syringes with the of female nurse or LHV from pregnant women and poured into red tip EDTA (ethylenediamine tetraacetic acid) tube. During the blood collection the given questionnaire were also filled from the donor.

Laboratory work

The blood samples were immediately transported to the Khyber teaching Hospital (KTH) laboratory. The hemoglobin (Hb), hematocrite (Hct), mean corpuscular volume (MCV), mean corpuscular Hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), red blood cell count (RBC), white blood cell count (WBC), and platelet count were determined by automatic hematological analyzer model (Symex Ks-21) having two reagent, cell pack and Stromatolyser-wwt 500 ml. The WHO classification was used to characterize anemia in pregnant women Hb <11 g per dL and non anemic (Hb >11 g/dL) group. The anemic women were further divided into Mild anemia 11.0-11.9 g/dl and 10-10.9 g/dl, Moderate anemia 10.0-10.9 g/dl and 7.0-9.9 g/dl and severe anemia <10.0 g/dl and <7.0 g/dl respectively (Paracha *et al.*, 1997).

Analysis of Data

The data was analyzed by using Statistical Package for the Social Sciences (SPSS) software. After analysis the data was expressed in table

Results

A total of 210 pregnant women were involved in this study. 142 (67.6%) of the women were anemic (Hb<11 g/dL). From each Tehsil 70 sample were taken. The percentage of anemia in pregnant women was high (82.8%) in Banda Daud Shah as compared to other urban Tehsil mostly the district Karak. The lowest prevalence was in urban area. This was 55.7% in tehsil Karak. In Takht-e-Nasrati 64.3% of pregnant women were anemic. This area was also for away from city (Table.1).

Table 1. Prevalence of anemia among pregnant women in district Karak.

Areas	Normal Hb level	Anemic (Hb< 11 g/dL) n (%)	Hb (Mean±SD)	Sample Size n=210
Karak	31(44.2)	39 (55.7)	10.4±1.78	70
Takht-e-Nasrati	25(35.7)	45 (64.3)	10.01±1.03	70
Banda Saud Shah	12(17.1)	58 (82.8)	9.7±1.23	70
Total	68(32.4)	142 (67.6)	10.0±1.34	210

3.1 Relation of Anemia incidence with education level

In the present study it was observed that the percentage of anemia was high (88%) in illiterate, 81.8% in primary, 75.5% in middle, 63.3% in matric, 59.4% in intermediate and 55.5% in bachelor educated women. The incidence of anemia was low 23.0% in master or highly educated women (Table. 2).

Table 2. Association of education level with anemia in pregnant women.

Education level	Normal Hb level n(%)	Aemia (Hb<11g/dL) n(%)	Sample Size n=210
Illiterate	3 (12)	22 (88)	25
Primary	6 (18.2)	27 (81.8)	33
Middle	11 (24.4)	34 (75.5)	45
Matric	11 (36.7)	19 (63.3)	30
Intermediate	15 (40.5)	22 (59.4)	37
Bachelor	12 (44.4)	15 (55.5)	27
Master	10 (76.9)	03 (23.0)	13
Total	68 (32.4)	142 (67.6)	210

3.2 Relation of Anemia incidence with Socio-economic conditions

The whole population was divided into three groups on the basis of socio-economic condition. The prevalence of anemia was high in lower class (<15000 PKR) (80%) as compare to middle class (from 15000 up to 20000 PKR) (59.8%) and in upper class (>20000) (52%) (Table.3).

Table 3. Association of anemia with economic level in pregnant women.

Socio-economic condition	Normal Hb level n (%)	Anemic (Hb<11g/dL) n (%)	Sample Size n=210
Lower class <15000	18 (20)	72 (80)	90
Middleclass =15000 up to 20000	39 (40.2)	58 (59.8)	97
Upper class >20000	11 (47.8)	12 (52)	23
Total	68 (32.4)	142 (67.6)	210

3.3 Trimester wise incidence of Anemia in pregnant women

Trimester wise anemia percentage was also investigated. It was observed that very high percentage of anemia was found in third trimester (81.9%) followed by second (61.3%) and first trimester (58.6%) (Table.4).

Table 4. Prevalence of anemia by Trimester.

Trimester	Anemic n(%)	Normal Hb level n(%)	Total sample n=210
First Trimester	37(58.6)	26(41.3)	63
Second Trimester	46(61.3)	29(38.7)	75
Third Trimester	59(81.9)	16 (22.2)	72
Total	142(67.6)	71(33.8)	210

Discussion

The present study determine that the percentage of anemia in pregnant women was high as compared to the other groups. In district Karak, the percentage of anemia in pregnant women was (67.6%). Because the pregnant women require special food during pregnancy for the development of foetus but the people/pregnant women is unaware from pregnancy requirement. The prevalence of anemia in pregnant women in some urban area of Pakistan was 90.5% (Ansari *et al.*, 2008) and found to high as compared to the present study. Two third of the pregnant women are affected from anemia. The prevalence of anemia among pregnant women of Aurangabad City, India was 87.2% (Lokare *et al.*, 2012).

The anemia association with education in the present study was 88% in illiterate, 81.8% in primary, 75.5% in middle, 63.3% in matric, 59.4% in intermediate and 55% in bachelor and low in master (23.8%) women. The incidence of anemia increases steadily with the decrease educational achievement. Less education was associated with high prevalence of anemia. One study found that the percentage of anemia among pregnant women in Aurangabad City , India were 96.4%, 94.8%, 92.1% and 91.5% among illiterate, primary, middle and secondary educated women respectively (Lokare *et al.*, 2012). The anemia percentage among illiterate women 53.7% was most common as compared to literate women 37.1% in Jima town Southwestern Ethiopia (Desalegn, 1993). The same studies conducted by National Family Health Survey (NFHS)-2 in 7 states and observe the anemia in pregnant women and their association with husband literacy (Agarwal and Agarwal, 2006). From the above information it is evidence that lower educated women the more probability of anemia during pregnancy because the women are unaware of pregnancy requirement. The women is unaware the nutritional requirement in pregnancy.

In the present study the percentage of anemia among pregnant women of lower class family (<15000) was 80% followed by middle class (>15000 upto 20000) 59.8% and upper class (>20000) 52%. The incidence of anemia was high among lower class pregnant women. A study conducted among pregnant women in Aurangabad city, India was high in lower socioeconomic condition (93.51%, 94.49% and 94.11%) in class III-V as compared to class I and II (47.61% and 71.42%) (Lokare *et al.*, 2012).

The incidence of anemia among pregnant women was high in third Trimester (81.9%) followed by second (61.3%) and first trimester (58.6%). Same result was also shown among pregnant women at Booking in Enugu, South Eastern Nigeria. The prevalence of anemia among pregnant women was in third Trimester 46.0%, in second 41.8% and in first Trimester 26.5% (Dim and Onah, 2007).

Conclusion

The prevalence of anemia among pregnant women of the present study was high 67.6%. The percentage was high in illiterate 88%, lower socioeconomic condition 80%, and 30-37 age pregnant women. According to the trimester level; the percentage of anemic women was high in third trimester (81.9%). In third trimester the requirements of the feotus increase. The pale skin most common clinical sign and symptom among pregnant women was 37.3%.

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