Prevalence and Detection of Anemia (Iron Deficiency) in women Population in Kohat Khyber Pakhtunkhwa, Pakistan

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Abstract: A total 200 blood samples of women of different ages have taken. Amongst these 114(57%) women were found to have iron deficiency (anemia). Prevalence rate of anemia in married (pregnant) women 44(66.6%), married (non-pregnant) women 38(55.87%) and young married girl 32(48.4%) having the their age ranges from 20-40years, above 40 and 12-20yrs were recorded. Most of the patients were found to suffer from Mild type of anemia 155(77.7%). Moderate type of anemia 41(20.3%) and severe types of anemia 4(1.85%) which were based upon serum hemoglobin concentrations. Majority of the women belong to poor community which lacks to the access of balance diet and health facilities

1. Introduction

Anemia is a clinical abnormality characterized by reduction in hemoglobin concentration below the normal range for age, sex, physiological condition and altitude from the sea level of a person (Idris and Rehman, 2005). Iron deficiency anemia (IDA) has worldwide prevalence and effecting 2 billion peoples (Yates, *et al*. 2004). IDA has 5% prevalence in the world, but in developing country it is 18% among adult women and 10% in adult men (Vahidinia and Shams, 2004). Anemia in pregnancy is further divided into mild anemia Hb level is10.0–10.9 g/dl, moderate anemia Hb level is 7.0–9.9 g/dl and severe anemia Hb level is 7.0 g/dl) (WHO, 1993). Hemoglobin is the iron-rich protein in red blood cells that carries oxygen from the lungs to all parts of the body . The total quantity of iron (Fe) for adult is 4g, while women will need approximately 50% more iron during pregnancy, increasing from 18 to 27 milligrams (mg) per day (Milman, *et al*. 1999) and pregnant women are at increased risk of iron deficiency anemia (WHO, 1993). Heavy menstrual bleeding has been reported in approximately 10-15% of all women at some point during their life. Among these women, as many as 20% will go on to develop iron deficiency anemia (Vercellini, *et al*. 1993). It is revealed during the study carried out in Tibet (China) that gestational age, ethnicity, residence and income are significantly associated with the hemoglobin concentration and prevalence of anemia (Xing, *et al*. 2007). Levels of comparable nutrition indicators for men and women in Pakistan contrast sharply with

levels in the US population. Anemia was more than 10 times as prevalent in Pakistani women as in US women. (Pappas, *et al*. 2001). It was found that with the increase of mother education and family income, the symptoms of anemia decreased and level of hemoglobin increased both for the mother and child (Batool, *et al*. 2010). The present study was designed to determine the prevalence and detection of anemia by blood Hb level in women population of Kohat Khyber Pakhtunkhwa, Pakistan.

2. Material and Methods
Study area

The study was carried out during June to August, 2010 in Kohat city of Khyber Pakhtunkhwa province, Pakistan. Kohat is covering total area of 2545 km^2 (982.6 sq mi). It is located at 33°35'13N 71°26'29E with an altitude of 489 meters (1607 feet). It consists chiefly of a bare and intricate mountain region east of the Indus, deeply scored with river valleys and ravines, but enclosing a few scattered patches of cultivated lowland. According to data from Pakistan's last census in 1998, the district's population stands around 562,640 with density of 221/km^2 (572.4/sq mi) and with an annual growth rate of 3.25%. The predominant language is Pashto, which is spoken by 77.54 percent of the total population, while Hindku is mostly spoken and understood in Kohat city and adjacent areas (SMEDA, 2009). The samples were collected randomly in the field from the house women and a questionnaire was prepared to collect the desire data of each women having the details of their name, age,

weight, marital status, blood pressure, locality, morning diet, evening diet, health history, education, activities, No. of family members, and monthly income etc.

Sample collection

A total 200 samples of blood (contains 1ml blood in each sample) were taken randomly from the married women of house hold in different ages in a sterilized vacutainer and placed in an ice jar, labeled and were brought to the laboratory of department of zoology kust for further process. Similarly the weight was measured by using CAMRY Mechanical personel scale (Model BR2017) and blood pressure was measured by using MASTER (Aneroid Sphygmomanometer) of the same women whom bloods were taken.

Measurement of Hb level

Hb concentration was measured by hematology analyzer (ABX MICROS 60 OT, France). The definition of anemia used in this analysis was an Hb concentration value of less than 12g/dl in non pregnant married women and less than 11g/dl in pregnant married women.

Prevalence

The prevalence of anemia was determined by the following formula.

$$\text{Prevalence (\%)} = \frac{\text{No. of anemic women detected}}{\text{Total No. of women samples examined.}} \times 100$$

Socioeconomic status

The socioeconomic status of the anemic and non anemic women population was determined with help of questionnaire.

Statistical analysis

Data was analyzed by using One Way ANOVA and One- sample T Test to determine the P.value.

3. Results and Discussion

Anemia is a serious health problem throughout the world. It effects the growth, energy and health of a people throughout the world. In the present study a total 200 samples were examined randomly from the married women population of Kohat city. Overall prevalence was 114(57%) women were found anemic having hemoglobin level below the cut off value i-e 11.0 g/dl for pregnant married women and 12.0g.dl for non-pregnant married women. Among these 44 (66.6%) were married pregnant, 38(55.8%) married non pregnant and 32(48.4%) were young married girl (Table-1). The highest prevalence of anemia was recorded in age group 20-40 years which is 44(66.6%). The lowest was recorded in above age of 12-20 years which is 32(48.4%). (Table-2) Majority of females had Mild anemia 155(77.7%), while

41(20.3%) had Moderate and only 4(1.85%) have Severe anemia. (Table-3). During the study it was observed that more than 70% of the women population belong to the poor community which lacks the access of balance diet and provision of health facilities. The world health organization estimates that over 30% of the world's population is anemic, of which 50% is attributable to Iron deficiency anemia (McLean, *et al.* 2009). In United States, the prevalence of iron deficiency anemia has been found to be 9-12% in white female and up to (20%) in female of African and Hispanic origin (Killip, *et al.* 2007). Similarly up to 20% of American children and 80% of children in developing countries become anemic at some point of their infancy i-e younger than 2 years (Brotanek, *et al.,* 2007). The highest prevalence rate of iron deficiency anemia was detected in pregnant women which is (66.6%), which is similar to study conducted in Ayub Medical College which shows that (53%) of patients were anemic for iron (Idris and Rehman, 2005). Similarly a study was done in Lebanon (Pennsylvania) on pregnant female entered parental care, in which (54%) have iron deficiency anemia (Brain, *et al.* 2000). Another study in Anatolian province (Turkey) with 800,000 inhabitant, showed a moderate prevalence of anemia in pregnant women i-e (27.1%) (Pekan, *et al.*2000). It is revealed during the study carried out in Indonesia that 20% of Indonesian females are anemic for iron deficiency (Khusun, *et al.* 1999). The Pakistan is developing country, so most of the people have a poor iron food. A study conducted in Dera Ismail Khan shows that 70% of the school going girls were anemic at the age of 6 years and (66.6%) at the age of 10 years (Ramzan, *et al.* 2009). Another study conducted in Pakistan on the bases of serum ferritin concentration shows that prevalence of anemia is (82.2%) in age group 21-60 years (Idris and Rehman, 2005).

Socio-economic status is a known determinant of anemia, in this study anemia was more prevalent among those women who had a low monthly income (poor community) and lack of health facilities. It was revealed that severe anemia reported at maximum in low income families (47.7%) (Batool, *et al.* 2010).

Conclusion

Anemia was a serious health concern because it affects directly growth and energy levels of the body. It is concluded from the study that anemia was the most common in women Population including young married and aged women of Khyber Pakhtunkhwa Pakistan.

Table 1. Showing the anemic and non-anemic female population of Kohat

S. No	Females	Total (200)	Hb Cut off point (g/dl)	Percentage of anemic and non anemic	Average Hb level (g/dl)	Average Age (Years)	Average Weight (Kg)	Average blood pressure (mmHg)
1	Young	66	Above12 Below12	34(51.5%) 32(48.4%)	12.4 10.6 ©	18.0 18.8 ©	48.4 50.3	110/70 110/70
2	Married (Non-preg)	68	Above12 Below12	30(44.1%) 38(55.8%)	12.9 10.3 ©	26.5 28.2 ©	59.8 57.8	120/80 120/80
3	Married (Preg)	66	Above11 Below11	22(33.3%) 44(66.6%)	11.8 9.8 ©	29 20.7 ©	63 64.5	120/70 110/70
Grand total.		200	Above12 Below12	86(43%) 114(57%)	12.7 10.6 ©	24.3 22 ©	54.4 63.5	110/70 120/80

Statistical analysis; One Way ANOVA, (P< 0.05) © Significant, (P>0.05) Non Significant

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Table-2: Age wise prevalence of anemia in women population of Kohat

S. No	Age range	Anemic prevalence N=200
1	12-20	32(48.4%)
2	20-40	44(66.6%)
3	Above 40	38(55.8%)

Statistical analysis; One- sample T Test, (P<0.05) © Significant, (P>0.05) ® Non significan

Table-3: Severity of anemia in women population of Kohat

Severity	Hb range (g/dl)	No. of females N=200	Percentage (%)
Mild	9.6-12	155	77.7% ®
Moderate	8.0-9.5	41	20.3% ®
Severe	<8.0	4	1.85% ®

Statistical analysis; One- sample T Test, (P<0.05) © Significant, (P>0.05) ® Non significan

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