FREQUENCY OF ANAEMIA IN MARRIED WOMEN IN JUTIAL, GILGIT

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ABSTRACT

Objective: To determine the frequency of anaemia in married women in Jutial, and to find out the relationship of risk factors of anaemia with levels of anaemia.

Study Design: Cross-sectional study.

Place and Duration of Study: Household survey carried out in Jutial, Gilgit 1st February 2008 to 30th April 2009.

Patients and Method: Interview administered questionnaire along with blood sample collection using sterilized disposable syringes was used in this study on a total of 382 randomly selected, willing, married, non-pregnant, non-lactating women with one or more children. Results were considered significant if 'r-value' was more than 0.5 with '*p*-value' less than 0.05.

Results: Clinical analysis of the blood samples showed that the average haemoglobin (Hb) level was 12.8 g/dl. According to WHO standards, no woman had severe anaemia with Hb level below 7 g/dl. Majority of the women (77.5%) had normal Hb $\geq$ 12 g/dl. The calculated anaemia frequency of 22.5% was found to be little lower than that of national anaemiafrequency of around 29 to 33%.

Conclusion: Frequency of anaemia 22.5% can be attributed to good education system in Northern Area and the awareness of people towards health concerns. Another reason can be the initiatives by different NGOs working in the area specially Aga Khan Foundation to eradicate anaemia by developing a vast network of health facilities. Further research on the native foods, their exact nutritional values / iron contents and any special foods at higher altitudes (may be more than 1500 meters) can open new horizon to our understanding of anaemia in the northern areas.

Keywords: Anaemia, Dietary habit, Haemoglobin, Risk factors, Frequency.

INTRODUCTION

Anaemia remains a widespread public health problem with major consequences for human health as well as social and economic development. It is the most common nutritional deficiency in the world, responsible for ill health, lost productivity, and premature death. Although estimates of the frequency of anaemia vary widely and accurate data are often lacking, it can be assumed that significant proportions of young children and married women and those in child bearing age are anaemic[1,2].

Pakistan is a developing country and the deficiencies of micronutrients exist in various segments of the population[3-6]. The recent national nutritional survey of Pakistan[7,8] has indicated that the population of Pakistan is at risk of deficiencies of micronutrients such as iron, iodine and zinc. These are more prevalent in children, pregnant and lactating women and aged people. In Pakistan, about 36% of the rural and 56% of the urban population are anaemic whereas 76% of rural pregnant women and 100% of urban lactating mothers, have low or deficient level of Hb[4,9]. In a study conducted by Tabassum[10], lower Hb and packed cell volume (PCV) values in women after delivery have been reported. She reported significantly higher (p<0.05) Hb and PCV in women of low socio-economic groups than middle and high.

According to WHO global database on anaemia[1], the national nutritional survey conducted for Pakistan during the year 2001-02[7] indicate alarmingly highfrequency of iron deficiency in the population especially women and children. The clinical signs of iron deficiency

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showed that 48.7% mothers and 29% children under five were iron deficient. The higher frequency of moderate anaemia (46.9% among males and 47.9% among females) and a lower frequency of severe anaemia (3.4% among males and 3.85% among females) were recorded during the survey[7].

WHO[11] have established cut-off points of Hb for pregnant females (11 g/dl), for non-pregnant females (12 g/dl), for men (13 g/dl) and for children 6-9 months (11g/dl) for children 5-11 years (11.5 g/dl) and for children 12-14 years (12g/dl). The range of 19 to 50 years is the recommended reproductive or child bearing age of women as indicated by Institute of Medicine, National Academy of Sciences[12].

The purpose of this study was to find the frequency of anaemia in randomly selected 382 married women (non-pregnant and non-lactating) from different households in Jutial, Gilgit and find a relationship between anaemia and its different factors such as age, income, education, parity, health awareness, worm infestation, blood loss and diet. Community based study was chosen as it gives a true picture of frequency of anaemia. It also helped to identify the severity of the problem and will be helpful also for further studies on the larger scale.

PATIENTS AND METHODS

The study was conducted in Jutial which is a small town within the city of Gilgit. It is a cross-sectional study where house hold survey was carried out to collect data. Four hundred and forty three women were visited during the course of the study using simple random sampling technique by application of random tables[13]. Three hundred and eighty two willing women fulfilling the criteria were first interviewed using comprehensive, consolidated, interview administered, structured, open-ended questionnaire and then followed by blood sampling and Hb estimation in the laboratory. About 2 to 2.5 ml blood was collected with the help of a disposable syringe from these volunteers and was dispatched to the laboratory. The Hb level (g/dl) was estimated automatically using blood analysers. Collected data was analysed by using statistical package for social sciences (SPSS) version 17, Minitab Statistical Software version 15 and Microsoft Excel 2010. Relationship between Hb level and other factors were analysed by using correlation test. Results were considered significant if 'r-value' was more than 0.5 with '*p*-value' less than 0.05. Due to limited resources and insufficient laboratory facilities in Gilgit, the study was restricted to estimation of Hb levels only and serumferritin, transferrin andiron binding capacity were not estimated.

RESULTS

The study was conducted in Jutial which is a small town of Gilgit city. A total of 443 houses were visited out of which 486 women were contacted. Out of 486 women 382 fulfilled the inclusion criteria (willing, non-diseased, married, non-pregnant, non-lactating women between the ages of 19 to 50 years and having one or more children). Only 13 women declined to be part of the survey. Haemoglobin (Hb), age and income profile of respondents in Jutial is given in table-1.

Among 382 respondents, only 5 (1.3%) were illiterate, 31 (8.1%) had education up to primary level, 99 (25.9)% up to middle, 110 (28.8%) were matriculate, 81 (21.2%) had education up to intermediate level, 41 (10.7%) were having bachelors and 15 (3.9%) were having Master's degree.

Within 382 respondents, 358 were having more than one child (2=29.6%, 3=44.2%, 4=17.8%, 5=2.1%). Single child mothers were only 24 (6.3%). Average number of children per woman was 2.8.

The diet taken by the women was distributed in 9 different groups as per various nutrition associations. Iron intake was calculated for each respondent based on their dietary habits spread over complete week. The weekly record of food intake was recorded against which iron intake was calculated based on nutrition charts provided by USDA national nutrient database[14].

Iron content of major foods being consumed by the respondents is given in table-2. It was found that the daily consumption of iron by the women varied from 15 to 20.24 mg with an average of 18.52 mg (standard deviation: 1.203 mg, variance: 1.447 mg). One hundred thirty one (34.3%) of women were taking iron below the minimum recommended scale of 18 mg and the majority of the women were taking the iron as per daily recommended scale 251(65.7%).

Table-1: Hemoglobin, age, income and iron intake profile of 382 women in Jutial, Gilgit.

Variable	Mean	Std Dev	Variance	Minimum	Maximum	Range
Hb (g/dl)	11.352	1.012	1.024	8.500	13.700	5.200
Age (Years)	31.003	7.018	49.252	19.000	50.000	31.000
Income (Rs)	21510	5618	31560258	12000	35000	23000
Iron Intake (mg)	18.521	1.203	1.447	15.001	20.244	5.243

The mean Hb concentration was 11.35 g/dl in the women under study. As per the WHO anaemia severity classification[15], no women had severe anaemia (Hb < 7 g/dl) whereas 53 (14%) women had moderate anaemia (7 to 9.99 g/dl) and 81 (21%) of the women were having mild anaemia with Hb level between 10 to 11.99 g/dl. Majority of the women (65%) had normal Hb (equal or above 12 g/dl). It was found that the anaemia frequency in the married women from age 19 to 50 years in Jutial, Gilgit was 22.5%. The calculated anaemia frequency is lower than that of national anaemia frequency of around 29 to 33%[16].

Relationship between Hb level of the respondents and some important risk factors such as age, socio-economic status, education, no of children, gap between the pregnancies, eating habits, etc were analysed. It was found that all the risk factors had significant correlation ($r > 0.50$ and $p < 0.05$) with Hb level of respondents. The matrix at table-3 gives the details of the same.

DISCUSSION

This community based cross-sectional study focused on reporting the frequency of anaemia in married women in Jutial which is a small town within the city of Gilgit with emphasis on finding relationship of anaemia with dietary intake and various risk factors.

Table-2: Iron contents (mg) in standard serving of different foods as per United States Department of Agriculture (USDA) national nutrient database.

Food	Iron content (mg)	Standard serving
Cooked beef and mutton	2.8	100 g
Cooked chicken	1.4	100 g
Fish	2.7	100 g
Pulses	2.2	100 g
Fresh cow milk	0.1	250 ml
Vegetables	1.8	100 g
Fruits	2.4	100 g
Plain wheat roti	1.7	100 g
Bread slice	0.7	50 g

Anaemia frequency in Jutial was found to be 22.5% which was almost equal to that of national frequencywhich was between 29 to 33%[16]. Clinical analysis of the blood samples showed that the average haemoglobin (Hb) level was 12.8g/dl. No woman had severe anaemia with Hb level below 7 g/dl. Fifty three (14%) women had moderate anaemia with the Hb level ranging from 7 to 9.99 g/dl, 81 (21%) women were having mild anaemia with Hb level between 10 to 11.99 g/dl whereas 248 (65%) women had normal Hb equal or above 12 g/dl.

The average age of the respondent was 31years having maximum number of respondents in 24-36 years range. In the study results, 256 (67%) of anaemic respondents (Hb < 12 g/dl) were from all age groups with 213 (83%) between 21 to 39 years of age. The correlation of Hb level

of respondents with age was non-significant (r=0.067, *p*=0.189). Moreover, it seems that the frequency of anaemia is not uniform through the whole age as some pockets of extreme frequency coexist with some pockets of improved situations.

Table-3: Hemoglobin and risk factor relationship matrix.

Variables		Hb	Age	Income	Iron Intake	Education	No of children
Age	**r**	0.067					
	p	0.189					
Income	**r**	0.551	0.076				
	p	0.000	0.139				
Iron intake	**r**	0.690	0.054	0.540			
	p	0.000	0.291	0.000			
Education	**r**	0.545	0.147	0.305	0.406		
	p	0.000	0.004	0.000	0.000		
No of children	**r**	-0.567	0.434	-0.123	-0.262	-0.080	
	P	0.000	0.000	0.016	0.000	0.119	
Gap between the children	**R**	0.535	0.301	0.092	0.214	0.186	0.129
	P	0.000	0.000	0.071	0.000	0.000	0.012

The economic status of most patients in our sample was low where about 214 (56%) patients had monthly income of less than Rs. 21,510 and 168 (44%) had income of more than the mean. The correlation between income and Hb came to be r=0.551 (*p*= 0.000) confirming that iron deficiency was more common in low socioeconomic class and it decreases as the income increase. A study was conducted in Karachi to determine socioeconomic differences in housewife's ability to take nutritional care which supported the effect of income on the nutritional level with the significance level 0.015[17].

Analysis of our study also supported the relationship between nutritional iron score taken by the respondents and Hb level; a positive correlation between these two variables was confirmed (r=0.690) and unpaired t-test was performed to confirm the significance of this correlation (*p* = 0.00) which is lesser than 0.05. This indicated that at any point if nutritional iron score was less, Hb level also decreased and if the nutritional iron score was more, Hb level was also more. It proves that lack of balanced diet leads to iron deficiency anemia. This had also been confirmed by Sabah et al in their study[18].

The low frequency can also be attributed to good education standards in the area. As already highlighted earlier, among 382 respondents only 5 (1.4%) were illiterate rest all had some sort of formal education with max number falling in the range of 8 years (middle) to 12 years (intermediate) of education. Inference can be drawn from this fact that educational status of women can have impact on the said problem as the analysis showed that mean Hb level of women with lesser education was less and it increases as the education increases (r=0.545). This fact had also been confirmed by Sabah et al in their study[18]. Although majority of the women had monthly house income around Rs 21500, but they were more cautious of their health and their diet which can be attributed to education. This fact can be seen by observing the considerable gap within the pregnancies vis-à-vis the number of children, lesser number of abortions, awareness of location of health facilities and

consumption of appropriate iron near the recommended daily iron intake.

CONCLUSION

The reason for anaemia frequency of 22.5% in northern area is because of higher literacy rate in the region due to well-established system of basic education. The initiatives by Aga Khan Foundation and other NGOs can be another reason for lower anaemia frequency through development of vast network of health facilities so as to eradicate anaemia. This study has not focused on the exact nutritional values and iron contents of the different foods in the northern areas. Further research for determining the exact nutritional values and iron contents at higher altitudes (may be more than 1500 meters) can be under taken for better understanding of low anaemia frequency in the northern areas.

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