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Anemia in Pregnancy

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FREQUENCY OF ANEMIA IN PREGNANCY AND ITS ASSOCIATION WITH SOCIO-DEMOGRAPHIC FACTORS IN WOMEN VISITING A TERTIARY CARE HOSPITAL IN RAWALPINDI

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ABSTRACT

Objective: The objective was to find out the frequency of anemia during pregnancy and its association with the different socio-economic factors.

Study Design: A descriptive cross-sectional study.

Place and Duration of Study: District headquarter hospital Rawalpindi, from September–November 2015.

Material and Methods: The pre-diagnosed 196 pregnant anemic women were included in the study. Grand multipara pregnant women, anemia due to bleeding disorders and havingchronic illnesses were excluded from the study. The pretested questionnaire along with Pakistan Social Living Standards Measurements (PSLM) prepared poverty score card was used. The study variables age, maternal education, abortions, parity and poverty were studied. The data collected were analyzed through SPSS 20.0 and Chi-square test was used to find out association between demographic variables and severity of anemia at a significance level of $p < 0.05$.

Results: The frequency of anemia in the sample (n=196) observed as mild, moderate and severe was 34.2% (67), 64.3% (126) and 1.5% (3) respectively. The mean (SD) hemoglobin recorded was 8.9 ± 0.9g/dl (range=6.2-10.9g/dl). The mean (SD) age in the sample was 23.7± 4.2 years (range=17-40 years) while 92% (182) of the subjects were below poverty line. Majority of the pregnant anemic women were illiterate constituting 56.6% (111) of the total sample.

Conclusion: There was a strong association between poverty, illiteracy, previous history of abortions, age and severity of anemia. Education, poverty, illiteracy, access to fortified sources, iron supplementation, deworming, and access to clean drinking water and sanitation, insecticides infections, inadequate nutrient intake all factors must be improved for success of anemia prevention strategies in developing countries like Pakistan.

Keywords: Abortions, Anemia, Parity, Pregnancy, Socio-demographic factors.

INTRODUCTION

Anemia is characterized by reductions in hemoglobin concentration, red-cell count, or packed-cell volume[1]. The mean minimum acceptable hemoglobin level during pregnancy by World Health Organization criteria is taken to be 11 g/dL[2]. Anemia has been recognized as serious public health problem for both developing and developed countries with serious implications on health[3]. Anemia falls in category I of Global Burden of disease where the prevalence of disease declines more than the mean mortality rate thus making it a preventable disease[4].

Pregnancy is probably the greatest physiological stress and biological change that a women faces during her lifetime[5]. World Health Organization (WHO) reviewed the nationally representative surveys from 1993 to 2005 and found out 42% of the women suffer from anemia during pregnancy worldwide[6]. Anemia during the pregnancy accounts for the one fifth of the maternal deaths. If effective interventions are put into play it can be prevented however, certain unfavorable socio-demographic factors act as the barrier in the way of the interventions[7]. The socio-demographic factors like age, maternal education, her employment status, family type, obstetric history of the female, hygiene, water

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supply and other infections all account for the causes of anemia in pregnancy[8]. Anemia in pregnancy in the developing countries is due to the various factors like iron and folate deficiency, poor intake, intestinal helminth infection and malaria[9]. Anemia occurs in all stages of life cycle but is especially prevalent in the reproductive age and menstruation, enhanced by the physiologic demands of the fetus and maternal blood volume expansion during pregnancy. Other contributing factors to the cause of anemia are genetic and poor hygiene that may lead to infections and infestations. With limited resources available to address public health problems, knowledge of

Table-I: Demographic characteristic of pregnant anemic women (n=196).

Factors	Group	Frequency	Percentage
Maternal Education			
	Primary	38	19.4
	Middle	17	8.7
	Matriculation	23	11.7
	Higher	7	3.6
	Illiterate	111	56.6
Employment Status			
	Employed	4	2.0
	Unemployed	3	1.5
	Student	2	1.0
	Housewife	187	95.4
Abortions			
	None	63	32.1
	1-2	117	59.7
	3-4	16	8.2
Parity			
	None	42	21.4
	One	42	21.4
	Two	75	38.3
	Three	28	14.3
	Four	9	4.6
Family Type			
	Joint	144	73.5
	Independent	52	26.5
Socioeconomic status			
	Extremely poor	7	3.6
	Chronically poor	116	59.2
	Transitory poor	59	30.1
	Transitory vulnerable	12	6.1
	Transitory non poor	2	1.0

group of the women and young children worldwide[10]. Anemia in pregnancy is an important yet preventable cause of maternal mortality in developing and developed countries[11]. The primary cause of anemia during pregnancy in Pakistan is nutritional deficiency secondary to chronic inadequate dietary intake the local etiological factors responsible for anemia is crucial in order to design appropriate prevention and treatment strategies. Most of the published studies from Pakistan have been conducted on women seeking care in clinical or hospital settings and thus may not give a true

picture of anemia and its causes in a population-based sample[12].

The rationale of the study was to find out the association of anemia in pregnancy with socio-demographic determinants and obstetric determinants like parity. Limited data is available on the association of anemia with these socio-demographic factors in Pakistan and even fewer interventions adopted to decrease the prevalence of anemia due to these associated factors. The purpose was to study the frequency of anemia during pregnancy and its association with different socio-demographic factors.

PATIENTS AND MATERIALS

Descriptive cross-sectional study was conducted for the tertiary care hospital, District Headquarters, Rawalpindi for a period of three months from September – November 2015. The sample size of 196 pregnant women was calculated and non probability purposive sampling technique was used. All pregnant women with pre-diagnosed anemia in their 2nd and 3rd trimester were included in the study. All grand multipara (delivered 5 or more times), pregnant women with anemia due to bleeding disorders or chronic illnesses or any cause other than pregnancy were excluded from the study. The questionnaire was developed for the study of the anemic pregnant women reporting in the Obstetric OPD of district headquarters hospital, Rawalpindi. Before the data collection a meeting was arranged with the gynecological and obstetric department for the understanding of the procedure. The antenatal days which were for the formation of the new antenatal cards were chalked down as less number of pre-diagnosed anemic cases would be reporting in those days. The rest of the days reportedly catered 200 pregnant women daily. During the data collection procedure the pre-diagnosed pregnant anemic women were identified. The consent form which was prepared in urdu was given to the study participants for their consent and understanding. Later the questionnaires were filled by the principal investigator. The data was collected over a period of two (02) weeks. The data entry and analysis were done in two (02) weeks. The collected data were checked for errors. The collected data were entered in SPSS 20.0 after proper coding of variables to draw the results. The descriptive part included the frequencies and percentages of the various categorical variables whereas continuous variables were presented as mean and standard deviation. Tables and graphs were then plotted. The association between the anemia in respondent pregnant women and associated factors like their age, parity, educational level, frequency of abortions, water supply at residence, socio-economic status of mother herself, and employment status of the husband was also analyzed through cross tabulation using Chi-square / Fisher's exact test. The *p*-value of <0.05 was taken as significant.

RESULTS

The frequency of anemia in the sample (n=196) observed as mild, moderate and severe was 34.2% (67), 64.3% (126) and 1.5%(3) respectively. Thus moderate anemia was more prevalent as compared to other degrees of anemia. The mean (SD) hemoglobin recorded was 8.9 ± 0.9 g / dl (range=6.2-10.9g / dl).

Out of 196 subjects, 18.4% (36) pregnant anemic women belonged to age group <20, 54.1% (106) fell in 20-24 years age bracket, 15.3% (30) in 25-29 years and 12.2% (24) ≥30 years. Thus the maximum pregnant anemic women were young belonging to the age group 20-24 years. The mean (SD) age in the sample was 23.7± 4.2 years (range=17-40 years). During the analysis it was found that 19.4% (38) pregnant anemic women (out of 196 subjects) studied till primary. The matriculate women were 11.7% (23). Majority of the pregnant anemic women were illiterate constituting 56.6% (111) of the total sample. Only 3.6% (7) of the women pursued their education beyond matriculation.

The demographic characteristics of the pregnant anemic women in the study sample (n=196) are shown in the table-I.

The poor category included extremely poor, chronically poor and transitory poor and scored 23 and below on poverty score card. The non-poor included transitory vulnerable, transitory non poor and non-poor who scored above 23 on poverty score card. Poverty has a strong association with moderate and severe anemia as the $p<0.001$, shown as table-II.

The young pregnant women included age groups <20 years, 20-24years, 25-29 years and elderly pregnant women were taken as equal to and above 30 years. The Chi-square was 74.1 and the $p<0.001$ on statistical analysis signifies strong association of moderate/severe anemia with young pregnant women, as shown in table-III.

The subjects with primary, middle, matriculation and above educational level were taken as educated and compared with illiterate pregnant women. The Chi-square was 13.17 and $p=0.001$ on statistical analysis signifies strong association of illiteracy with moderate and severe anemia, see table-IV.

The number of abortions 1-2, 3-4, more than and equal to 5 were categorized as abortions and were compared with no abortions. The Chi-square 7.44 and $p<0.05$ on statistical analysis signifies strong relationship of history of previous abortions with moderate/severe anemia.

DISCUSSION

The study results revealed that the frequency of anemia was high in pregnancy in the women reporting to the tertiary care hospital in District Rawalpindi. The prevalence of anemia in pregnant women in Pakistan is 51% and 48.6 % in Rawalpindi as per the national nutrition survey 2011 which is very close to the study conducted in the same year by Nils Milman on the prevalence of anemia globally. That study reported prevalence of anemia in pregnant women in South Asia as 48%[13]. The association of age with the anemia during pregnancy was studied and the age was categorized as less than 20, 20-24 years, 25-29 years and above 30. It was found out that the frequency of anemia was maximum in the age group of 20-24 years. The study results comply with previous study conducted in federal government services hospital in Islamabad where the anemia was most prevalent in the pregnant women aged 20-24 years[14].

The maternal education regarding dietary intake during pregnancy, antenatal visits,

Table-II: Association of poverty with severity of anemia.

Poverty Level	Mild Anemia	Moderate/Severe Anemia	Total	Chi-Square	*p*-value
Poor	54	128	182	23.07	0.001
Non-poor	13	1	14		
Total	67	129	196		

Table-III: Association of maternal age with severity of anemia.

Maternal Age	Mild	Moderate/Severe	Total	Chi-Square	*p*-value
Young pregnant	23	119	142	74.1	0.001
Elderly pregnant	44	10	54		

Table-IV: Association of maternal educational level with severity of anemia.

Maternal literacy level	Mild anemia	Moderate/severe anemia	Total	Chi-Square	*p*-value
Educated	41	44	85	13.17	0.001
Illiterate	26	85	111		

prevention and treatment of anemia can only be achieved if the mother is educated enough. The present study revealed that the prevalence of anemia was the most in the illiterate women reporting in the tertiary care facility in Rawalpindi with 56.6% (111). The results of association of maternal education level with prevalence of anemia during pregnancy are close to the study conducted in Ahmednagar, Maharashta, India that reported prevalence of anemia as 48% in illiterate pregnant women[10]. The statistical analysis revealed a strong association between illiterate women and moderate/severe anemia in pregnant women with $p<0.001$.

The poverty remains the main contributing factor in the causation of anemia in pregnant women. The study revealed that 92%(182) of the pregnant anemic women reporting in the tertiary care hospital in Rawalpindi were below the poverty line. A study conducted in another tertiary care hospital in Rawalpindi revealed 81% of the pregnant anemic women belonged to the low socio-economic group and were living below the poverty line[15].

The association of parity with prevalence of anemia in pregnant women was studied in the research and it was found that the anemia was most prevalent in the women with previous two (02) alive kids. The frequency was 38.3% (75) in the study. Several studies in the past have shown that the prevalence of anemia in pregnant women is the most with parity 2 to 4[7]. A study carried out in Bareilly India showed 42% prevalence of anemia in pregnant women with two alive kids[16]. However no exact percentage was found out that comply with our results. The statistical analysis revealed no strong association of parity with the severity of anemia.

The study showed no statistically significant results for the association of anemia during pregnancy with type of the water supply at the domestic household level however, 45.4% (89) of the pregnant anemic women had a community water supply in their homes. Neither was there any significant association between the ethnicity and frequency of anemia however, 73.5% (144) of the women were Punjabi. Moreover the frequency of anemia in housewives was 95% (187) but there was no significant association statistically. Similarly 93% (183) of the husbands of the pregnant anemic women were employed however, not significant statistical results were revealed with $p>0.05$.

CONCLUSION

There was a strong association between poverty, illiteracy, previous history of abortions, age and severity of anemia.

Education, poverty, illiteracy, access to fortified sources, iron supplementation, deworming, and access to clean drinking water and sanitation, insecticides infections, inadequate nutrient intake all factors must be improved for success of anemia prevention strategies in developing countries like Pakistan.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES

1. Balarajan Y, Ramakrishnan U, Özaltin E, Shankar AH, Subramanian S. Anaemia in low-income and middle-income countries. The Lancet. 2012;378(9809):2123-35.
2. Jufar AH, Zewde T. Prevalence of anemia among pregnant women attending antenatal care at tikur anbessa specialized hospital, Addis Ababa Ethiopia. J Hematol Thromb Dis. 2014;2(125):2.
3. Melku M, Addis Z, Alem M, Enawgaw B. Prevalence and predictors of maternal anemia during pregnancy in Gondar, Northwest Ethiopia: an institutional based cross-sectional study. Anemia. 2014;2014.
4. Murray CJ, Lopez AD. Measuring the global burden of disease. New England Journal of Medicine. 2013;369(5):448-57.
5. Mahfouz AA, El-Said MM, Alakija W, Badawi IA, Al-Erian R, Moneim MA. Anemia among pregnant women in the Asir region, Saudi Arabia: an epidemiologic study. Southeast Asian journal of tropical medicine and public health. 1994;25(1):84-7.
6. Black RE, Allen LH, Bhutta ZA, Caulfield LE, De Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. The lancet. 2008;371(9608):243-60.
7. Lokare PO, Karanjekar VD, Gattani PL, Kulkarni AP. A study of prevalence of anemia and sociodemographic factors associated with anemia among pregnant women in Aurangabad city, India. Annals of Nigerian Medicine. 2012;6(1):30.
8. Biswas M, Baruah R. Maternal anaemia associated with socio-demographic factors among pregnant women of Boko-Bongaon

Block Kamrup, Assam. Indian Journal of Basic and Applied Medical Research. 2014;3(2):712-21.
9. Brabin BJ, Hakimi M, Pelletier D. An analysis of anemia and pregnancy-related maternal mortality. The Journal of nutrition. 2001;131(2):604S-15S.
10. Ahmad N, Kalakoti P, Bano R, Aarif SM. The prevalence of anaemia and associated factors in pregnant women in a rural Indian community. Hindu. 2010;208:67.1.
11. Viveki R, Halappanavar A, Viveki P, Halki S, Maled V, Deshpande P. Prevalence of anaemia and its epidemiological determinants in pregnant women. Al Ameen J Med Sci. 2012;5(3):216-23.
12. Baig-Ansari N, Badruddin SH, Karmaliani R, Harris H, Jehan I, Pasha O, et al. Anemia prevalence and risk factors in pregnant women in an urban area of Pakistan. Food and nutrition bulletin. 2008;29(2):132.
13. Milman N. Anemia—still a major health problem in many parts of the world! Annals of hematology. 2011;90(4):369-77.
14. Rizvi F. Impact of maternal education, and socioeconomic status on maternal nutritional knowledge and practices regarding iron rich foods and iron supplements. Ann Pak Inst Med Sci. 2012;8(2):101-5.
15. Khan DA, Fatima S, Imran R, Khan FA. Iron, folate and cobalamin deficiency in anaemic pregnant females in tertiary care centre at Rawalpindi. J Ayub Med Coll Abbottabad. 2010;22(1):17-21.
16. Agarwal K, Agrawal V, Agarwal A, Kumar R, Sharma M. Prevalence and determinants of anemia in pregnancy at private hospital of Bareilly District. 2011.