
ORIGINAL RESEARCH ARTICLE**Risk Factors for Anemia in Pregnancy: A Case Control Study***Rutuja Pundkar¹, Jagdish Powar², Swapnil Sonar³, Maruti Desai⁴**Assistant professor, Department of community medicine SMBT Medical college, Nashik¹,
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Abstract:**Background:**

Aim of the study was to find the risk factors leading to Anemia in pregnancy. The main objective was to study the various sociodemographic factors leading to anemia. And to assess the knowledge about anemia among study participants.

Material and methods:

The present Case control study was carried out at Primary Health Centre, to determine the risk factors leading to anemia in pregnancy. A total of 308 pregnant females were registered. Among them two groups were made, group I cases and group II controls. Each group had 50 cases each. Laboratory test were done and females having hemoglobin less than 11mg/dl were considered anemic. Anemic females were considered cases and females having Hb >11mg/dl were considered controls. Data analysis was done using SPSS software.

Results:

The overall mean haemoglobin (Hb) was 11.55g/dL in controls, whereas it was seen that among the cases it was 9.58g/dL. It would seem that diet, family size, education, social class, gravida and parity are associated with anemia in pregnancy.

Conclusion:

After adjusting for all the possible covariates there seems to be significant association between Hb levels and age group, education level, family size, diet, gravida and parity.

Keywords:

Anemia, pregnancy, knowledge, sociodemographic.

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Introduction:

The nutritional status of the expectant mother is the most important determinant of pregnancy outcomes, including the birth weight of the newborn.⁽¹⁾ Anemia is particularly high for women with no education, women from scheduled tribes, and women in the two lowest wealth quintiles⁽²⁾. Anemia is an indicator of both poor nutrition and poor health. Iron deficiency in its most severe form results in anaemia – IDA – and since haemoglobin concentration is relatively easy to determine, the prevalence of anaemia has often been used as a proxy for IDA. Food-based approaches to increase iron intake through food fortification and dietary diversification are important sustainable strategies for preventing iron deficiency and IDA in the general population. However, approaches that combine iron interventions with other measures are needed in settings where iron deficiency is not the only cause of anaemia. Strategies should be built into the primary health care system and existing programmes such as maternal and child

health, integrated management of childhood illness, adolescent health, making pregnancy safer/safe motherhood, roll-back malaria, deworming (including routine antihelminthic control measures) and stop-tuberculosis⁽³⁾. Anemia is considered a severe public health problem by World Health Organization when anemia prevalence is equal to or greater than 40% in the population. Anemia prevalence's during pregnancy differed from 18% in developed countries to 75% in South Asia⁽⁴⁾. The demand for iron increases about six to seven times from early pregnancy to the late pregnancy⁽⁵⁾. Besides poor nutrition, frequent labour, multiparity, abortions, parasitic infestations, consuming excess tea or coffee after meals determined as the predictors of anemia in reproductive age women⁽⁶⁾. Worldwide, anemia contributes to 20% of all maternal deaths⁽⁷⁾. The World Health Organisation defines a non-pregnant woman with haemoglobin of less than 12 g/dl at sea level as likely to be anaemic. Accounting for the physiological changes in pregnancy, the equivalent value for pregnant women is 11

g/dl or a haematocrit less than 33% (WHO, 1972)⁽⁸⁾. This study used 11.0 g/dl as the criteria for anaemia in pregnancy following the WHO recommendations ⁽⁸⁾. Knowledge of the sociodemographic factors associated with anemia in pregnancy can be used to formulate a multipronged strategy to attack this important public health problem. Hence, a case control study was undertaken to know the various risk factors leading to anemia in pregnancy.

Aim:

To find the risk factors leading to Anemia in pregnancy.

Objectives:

- To study the various sociodemographic factors leading to anemia.
- Find the association between sociodemographic factors and anemia.
- To assess the knowledge about anemia among study participants.

Material & methods:**Study design:**

The present was a Case control study

Study area:

Carried out at Primary Health Centre (Takali Khatgoan) Ahmednagar.

The PHC was located 12 km from Ahmednagar on Kalyan Road. Total population covered by the PHC was approximately 35,066 people. It had 13 villages & 6 subcentres. Total population of Takali Khatgoan is 5,959 people. The Ante Natal Clinic (ANC) is held every 1st & 3rd Wednesday of the month.

Sample size:

Pregnant women visiting the ANC clinic were enrolled by health worker separately for the first & the subsequent visit of pregnant women. A total 308 pregnant women visiting the health center were enrolled.

2 groups were made by systematic random sampling. Among 2 groups 50 were cases and 50 were controls.

Inclusion criteria:

For cases were, hemoglobin count less than 11gm% & for controls was hemoglobin count more than 11gm%.

Study procedure:

Informed consent was obtained & explanation as to the purpose of study was

offered. Thus, pregnant women were interviewed with predesigned, pretested, semi structured questionnaire. A detailed demographic profile of the women, that is, age, age at first pregnancy, religion, family size, education, and occupation was collected. Socioeconomic classification suggested by B.G. Prasad was adopted & updated⁽⁹⁾.

Laboratory method:

Hemoglobin level was estimated by Sahli's acid hematin method of hemoglobin estimation⁽¹⁰⁾. According to World Health Organization (WHO), hemoglobin level below 11g/dL is labeled as anemia during pregnancy. The same criteria were used for diagnosing anemia in pregnancy⁽¹¹⁾.

Ethical approval:

Ethical approval for the study was obtained from the ethical committee at the Medical College, Ahmednagar.

Data analysis:

Data analysis was performed using SPSS 21. Descriptive statistics, including mean, range, & standard deviations, were calculated for all variables. Proportions were compared using Chi-square tests & chi square for trend at 0.05 level significance.

Results:

The present study revealed that the age of the respondents ranges from 19 to 29 years. It was seen that majority of the age of study participants ranged from 20 to 25 years. With mean age being 22 years.

Table 1: Association between Sociodemographic factors and anemia among the study population.

Information acquired retrospectively	Cases (50)	Contr ols (50)	Significa nce
Maternal Age (mean)	21.92±2.35	21.86±2.1	n.s
Education (literate)	41	30	p<0.0076
Occupation (unemployed)	39	44	n.s
spacing 2 or <2 years	18	16	n.s
Family size (>3)	39	27	p=0.0056
Diet (non veg)	15	5	p=0.0062

Figure 2: Knowledge about Anemia Among Controls & Case

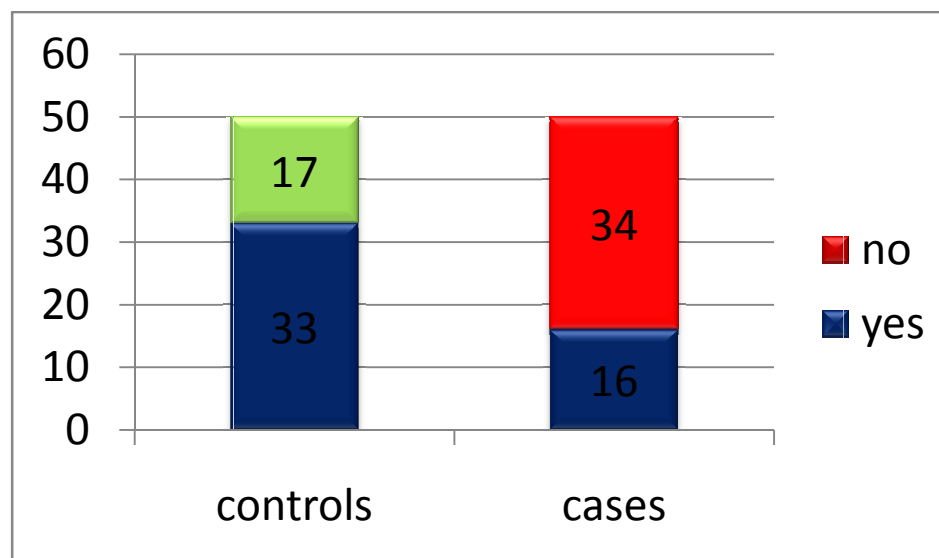


Figure 3: Family Size and anemia among the study population

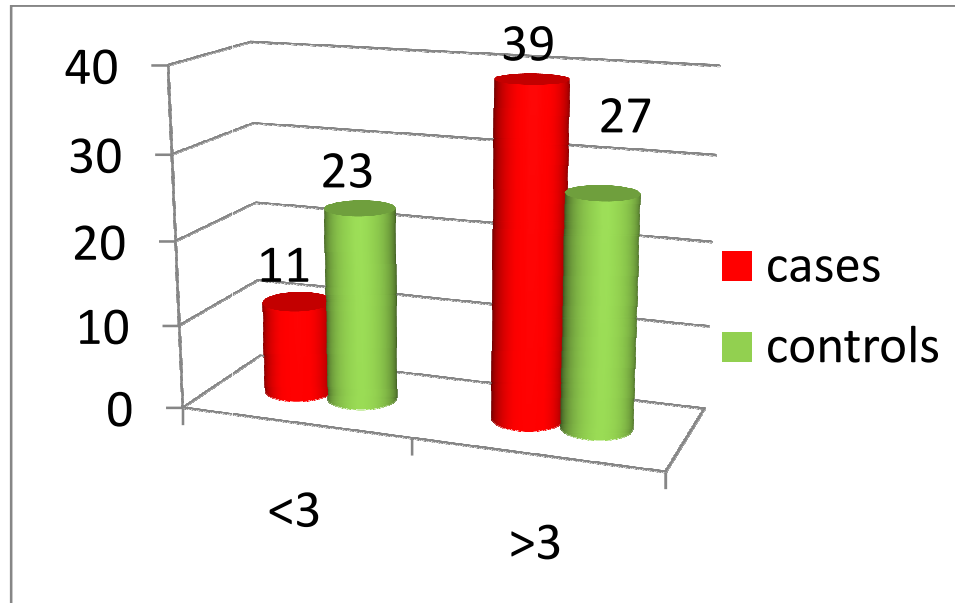


Figure 4: Diet and Anemia among the study population

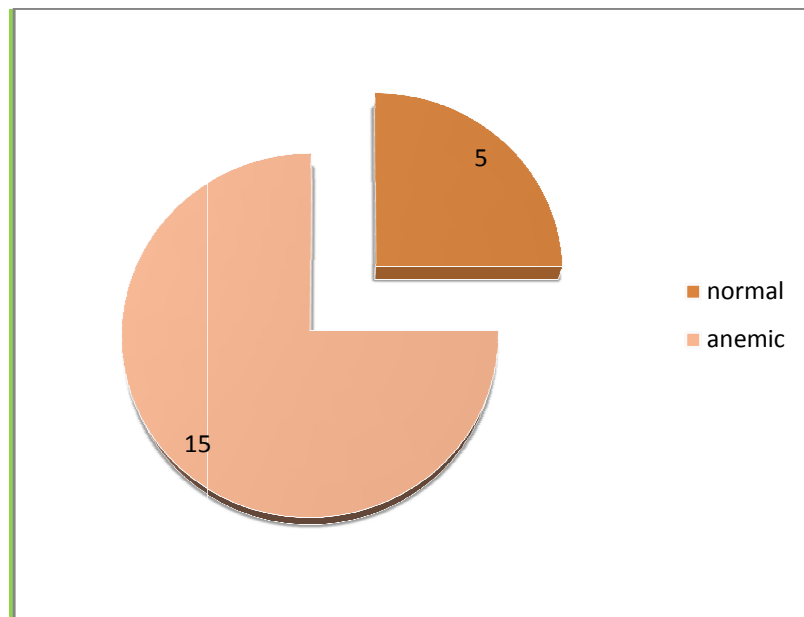


Table 2: Assessment of knowledge among the study population

Assessment of knowledge	Cases (n=50)	Controls (n=50)	Significance
Knowledge (present)	34	17	p=0.00033

Discussion:

The overall mean haemoglobin (Hb) was 11.55g/dL in controls, whereas it was seen that among the cases it was 9.58g/dL. It would seem that diet, family size, education, social class, gravida and parity are associated with anemia in pregnancy. Resent study showed that as the level of education goes on increasing the percentage of anemia in pregnant women goes on decreasing. The study also showed that as the family size increased the percentage of anemia also increased. The pregnant women having vegetarian diet were more prone to the disease as compared to those having mixed diet. Table no 1 show that factors like education, family size, diet, knowledge are associated significantly. Whereas factors like maternal age, occupation, previous obstetrics history, etc are not significant.

As compared to other studies like; Haniff et al⁽¹²⁾, they found that age, ethnicity, education, social class, urban rural residence,

gestational age, gravida and parity are also associated with anemia in pregnancy.

Study by Taner et al⁽¹³⁾ also showed that 41.6% had hemoglobin levels <11g/dl. This high prevalence of anemia among pregnant women in Taner's study was explained by the distribution of socioeconomic status of the population. It showed that low socioeconomic status had more anemic cases. Ahmad Z et al⁽⁸⁾ in their study stated that the age of the mother is significantly associated with anaemia, with the majority of mothers (56.6%) who are more than 40 years old being anaemic at the first anatenatal visit. By parity, 37.5% of the primigravida, 47.1% of the multigravida, 52.9% of the grandmultipara and 64.0% of the great grandmultipara were anaemic. Again, parity is shown to be significantly associated with anaemia.

A study in Pakistan showed that anemic subjects were slightly older than nonanemic subjects; whereas nonanemic

women were significantly taller and heavier, and a lower proportion were underweight (BMI < 18.5). In addition, anemic women were more likely to have no formal education and to be employed outside the home. The number of prior pregnancies was inversely related to mean hemoglobin level. Women who reported consumption of red meat or chicken two or more times per week before pregnancy had higher hemoglobin concentrations, but only the differences in mean hemoglobin concentrations associated with consumption of red meat were significant (10.03 vs. 9.87 g/dL, $p = .004$).⁽¹⁴⁾

In a study by Leyla K⁽¹⁵⁾ it was seen that the mean ages of anaemic and nonanemic women were similar, 26.9 and 26.4 years respectively ($p > 0.05$). Of the women, 10.2% were illiterate, 55.1% were primary school graduates. Anemia was majorly seen in vegetarian (37.0%) ($p < 0.05$).

Conclusion:

- After adjusting for all the possible covariates there seems to be significant association between Hb levels and age group, education level, family size, diet, gravida and parity.
- A study is in progress to ascertain the outcome of anemia in pregnancy in the Primary Health Centre.

- Future studies are needed to look into the cutoff levels of Hb associated with the relative risks & odds ratio.

Conflict of interest: None to declare

Source of funding: Nil

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