A Cross Sectional Study on Prevalence of Anaemia and its Determinant Factors among Pregnant Mothers in a Rural Community

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Author’s contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Anemia is the greatest common nutritional deficiency disorders affecting the pregnant women in the developing countries and determine the prevalence of anaemia among pregnant women in a rural community and determine the socio demographic factors and obstetric factors associated with anaemia. The objective of the study was to evaluation the prevalence of anemia between pregnant women and to regulate its association with maternal and fetal consequences. The care given by the health care provider to a pregnant woman during her pregnancy period (a period of 280 days) is known as antenatal care. This research was carried out in rural field practicing area, Sripuram Kanchepuram district of Tamilnadu. The pregnant mothers residing in this area were taken as the study subject. This study was conducted for a period of four month from June 2014 to September 2014. Anaemia is considered a severe public health problem by World Health Organization when anaemia prevalence is equal to or greater than 40% in the population. Iron deficiency is highest population subgroups that are at peak growth rates that is infant, children and pregnant mothers. Anaemia in pregnancy, the most common micro nutritional deficiency (disorder). It is estimated that more than 50% of pregnant women are anaemic and majority (90%) belongs to iron deficiency. The great incidence of anemia in pregnant women speciously increases the maternal and fetal risks. To increase maternal and fetal effect, it is suggested that the primary health care has to be strengthened, prevention, initial diagnosis, and treatment of anemia in pregnancy to be given priority.
Keywords: Pregnancy; anaemia; infants; children; disorder.

1. INTRODUCTION

Anemia is the second most common cause of maternal death in India and contributes to about 80% of the maternal deaths caused by anemia in South East Asia. Anemia is also an established risk factor for intrauterine growth retardation, leading to poor neonatal health and perinatal death. The inability to meet the required level for these substances either due to dietary deficiencies, inadequate absorption or infection in conjunction with blood loss during pregnancy gives rise to anemia. Numerous factors influence the causes of anemia among pregnant women. In place of occurrence, geo-helminth infections throughout pregnancy may be associated with maternal anaemia. Hookworm is known to be causes of anaemia among pregnant women and hookworm infection essentially aggravates anaemia in pregnant women [1-3]. Infections by geo-helminthes lead to malnutrition, iron deficiency anaemia, and increased susceptibility to other infections in infected pregnant women. The prevalence of anaemia varies widely in different settings and accurate data are often lacking. In the millennium development goal five the target is to reduce the maternal mortality rate to three quarters by the year 2015. Those living in Asia and Africa are at greater risk. In developing countries every second pregnant women are estimated anaemic [4].

Anemia is multifactorial in etiology; the disease is assumed to be generally caused by iron absence in developing countries. In sub-Saharan Africa where iron deficiency is common, the prevalence of anemia has often been used as a substitution for iron deficiency anemia (IDA) [10-14]. Further micronutrient insufficiency (vitamins A and B12, riboflavin, and folic acid) has also been a cause of anemia through pregnancy deaths due to anaemia in South Asia. In the early nineties the attempt to reduce the prevalence of anaemia in India was much lower than the neighbouring South and South East Asian countries. It is estimated that about 20%-40% of maternal deaths in India are due to anaemia, India contributes to about 50% of global maternal deaths due to anaemia [15]. According to NFHS 3 (2005-2006) about 56 percent of pregnant women in south India were anaemic. Karnataka being 62.6 percent followed by Andhra Pradesh (58.5 percent) and Tamil Nadu (57.8 percent) prevalence of anemia was least in Kerala (35.2 percent) [16].

Anaemia is a major public health problem, in spite of many interventional programs. About one third of the global population is anaemic (WHO 2010). Early detection and effective management of anaemia in pregnancy can lead to reduction in under nutrition in childhood, adolescence and improvement in adult health that is the future progeny will be a healthy citizen, thus improving the family and countries socio economic status. In spite of the extensive knowledge on the epidemiology of anemia, its control and prevention still it continues to be a major public health problem. Therefore a unique approach has to be redefined to bring down the prevalence of anemia among pregnant mothers [16,17].

2. MATERIALS AND METHODS

Study design: This is a population based cross sectional study in rural field practicing area, Sripuram Kancheepuram district of Tamilnadu. The pregnant mothers residing in this area were taken as the study subject. This study was conducted for a period of four month from June 2014 to September 2014.

2.1 Sampling Method

Pregnant women who were registered during the period of 1st September 2013 till 30th June 2014 were listed out from the antenatal register available at RHTC Sripuram attached to Sree Balaji Medical College and Hospital (SBMCH). By using simple random technique, sample (270) was identified.

2.2 Pilot Study

Pre-testing was carried out on thirty subjects for standardizing the questionnaire. Based on the observations made during the pilot testing, necessary changes were made in the questionnaire. The results of the pilot test were not included in the final analysis.

2.3 Tool for Data Collection

A structured questionnaire was prepared based on the questionnaire used in the studies done in...
the past. The questions were related to socio
demographic and obstetric factors associated
with anaemia and data related to haemoglobin
level were recorded from the mother child
protection card.

2.3.1 Inclusion criteria

All pregnant mothers residing in the rural
field practice area (Sripuram) of the medical
college at the time of survey were included in
the study.

2.3.2 Exclusion criteria

Those who were not willing to participate and
those who were not having their mother child
protection card at the time of survey were
excluded.

2.4 Data Collection Methods

The data were collected from 270 pregnant
mothers. By making house to house visits all the
selected subject were interviewed. The purpose
of the study was clearly explained to them.
Inform consent was obtained in local (Tamil)
language before administering the questionnaire.
A semi structured questionnaire was
administered and the questions related to socio-
demographic and obstetric factors were collected
from the mother and the haemoglobin values
were recorded from the mother child protection
card.

2.5 Statistical Analysis

The data was collected and entered in an excel
sheet. Then data was analysed using SPSS
version 16. Prevalence of anaemia was
expressed in frequencies. Various factors
associated with anaemic status of the
pregnant mothers were analysed using chi
square for significance at 95% Confidence
interval.

3. RESULTS AND DISCUSSION

This study is a community based cross sectional
study carried out in a rural field practicing area of
Sree Balaji Medical College and Hospital of
Kancheipuram district among 270 antenatal
women and the study period is from June
2014 to August 2014. Table 1 illustrates the
demographic information of the respondent. The
study participants were between the age group of
15 to 35 years. Majority of the respondent
belonged to the age group of 15 to 24 years
(48.5%) 131 and about 89.9% of them belonged
to Hindu religion.

Majority of the respondent (40.4%) have
completed their middle school. About 98.9% of
the study participants are home worker. About
56.7% of them were from nuclear family and
78.9% lived in pucca house. Majority of the study
participants were belong to the social class upper
middle (54.4%). Majority 70.7% of them had their
own toilet facility and 19.6% of them had open
sullage drainage system.

About 24.8% of them attained menarche less
than 13 years of age and 35.2% of them got
married less than their legal age for marriage.
Multi gravid were about 33%. The total abortions
were only 3.7%. Out of the total abortion
2.6% was spontaneously aborted and 2.2% was
induced legal and there is no illegal abortion.
Majority 90% of them were passive smoker.
80% of them have dewormed only 3% received
parenteral iron. 93.3% (252) did not have any
complication with only 2 of them having
PIH, fever, 6 were malpresentation and 7 having
gestational diabetic (Table 2).

Prevalence of anaemia in the participant
Prevalence of anaemia in the current study is 41.5%
as depicted in Table 3.

3.1 Association of Socio Demographic
Factors with Anaemia

The prevalence of anaemia in the study
population is likely to be influenced by various
socio demographic factors described. In this
section the association of anaemia with various
socio demographic factors has been brought
out. In this study, pregnant women who have
been exposed to passive smoking are 0.4 times
at risk of getting anaemia (p< 0.004 and X 2 a.
8.2). Study participants those who were
vegetarians are 62times more prone for anaemia
than non-vegetarians (p<0.009 and X 2-6.8). (Table 5)
Table 1. Demographic characteristics' of the respondent

| S.no | Characteristic's          | Frequency(N=270) | Percentage ± 1-3 |
|------|---------------------------|------------------|------------------|
| 1    | Age                       |                  |                  |
|      | 15-24                     | 131              | 48.5             |
|      | 25-29                     | 108              | 40.0             |
|      | >=30                      | 31               | 11.5             |
| 2    | Religion                  |                  |                  |
|      | Hindu                     | 242              | 89.9             |
|      | Muslim                    | 8                | 3.0              |
|      | Christian                 | 20               | 7.4              |
| 3    | Education                 |                  |                  |
|      | Graduate/pg               | 42               | 15.6             |
|      | Intermediate/post high school diploma | 12 | 4.4 |
|      | HSC                       | 85               | 31.5             |
|      | Middle school             | 109              | 40.4             |
|      | Primary                   | 21               | 7.8              |
|      | Illiterate                | 1                | 0.4              |
| 4    | Occupation,               |                  |                  |
|      | Professional              | 1                | 0.4              |
|      | Semiprofessional          | 1                | 0.4              |
|      | Unskilled worker          | 1                | 0.4              |
|      | Unemployed                | 267              | 98.9             |
| 5    | Family                    |                  |                  |
|      | Nuclear                   | 153              | 56.7             |
|      | Joint                     | 116              | 43.0             |
|      | Three generation          | 1                | 0.4              |
| 6    | Personal history          |                  |                  |
|      | Passive smoking and beetel-nut chewer | 134 | 49.6 |
| 7    | Diet history              |                  |                  |
|      | Vegetarian                | 11               | 4.1              |
|      | Mixed diet                | 243              | 90.0             |
|      | Eggeterian                | 16               | 5.9              |

Table 2. Obstetric characteristics' of the respondent

| S.no | Characteristics          | Frequency (N=270) | Percentage ± 1-3 |
|------|--------------------------|-------------------|------------------|
| 1    | Menarche age             |                   |                  |
|      | <13 yrs                  | 67                | 24.8             |
|      | >=13 yrs                 | 203               | 75.2             |
| 2    | Period cycle             |                   |                  |
|      | Regular                  | 263               | 97.4             |
|      | Irregular                | 7                 | 2.6              |
| 3    | Flow pattern             |                   |                  |
|      | <3 days                  | 4                 | 1.5              |
|      | 3-5 days                 | 248               | 91.9             |
|      | >5 days                  | 18                | 6.7              |
| 4    | Number of days           |                   |                  |
|      | <21 days                 | 2                 | 0.7              |
|      | 21-35 days               | 265               | 98.1             |
|      | >=36 days                | 3                 | 1.1              |
| S.no | Characteristics                           | Frequency (N=270) | Percentage |
|------|------------------------------------------|------------------|------------|
| 5    | Marriage age                             |                  |            |
|      | <21 yrs                                   | 95               | 35.2       |
|      | >=21 yrs                                  | 175              | 64.8       |
| 6    | Gravidity                                 |                  |            |
|      | Primi                                     | 181              | 67.0       |
|      | Multi                                     | 89               | 33.0       |
| 7    | Number of live children (n=89)            |                  |            |
|      | No children                               | 4                | 4.5        |
|      | One child                                 | 84               | 94.4       |
|      | Two child                                 | 1                | 1.1        |
| 8    | Number of abortion                        |                  |            |
|      | No abortion                               | 257              | 95.2       |
|      | 1 abortion                                | 10               | 3.7        |
|      | 2 abortion                                | 3                | 1.1        |
| 9    | Abortion type                             |                  |            |
|      | Spontaneous                               | 7                | 2.6        |
|      | Legally induced                           | 6                | 2.2        |
|      | Illegally induced                         | 0                | 0          |
|      | not applicable                            | 257              | 95.2       |
| 10   | Personal history                          |                  |            |
|      | Passive smoking and betelnut chewer       | 134              | 49.6       |
| 11   | Diet history                              |                  |            |
|      | Vegetarian                                | 11               | 4.1        |
|      | Mixed diet                                | 243              | 90.0       |
|      | Eggetarian                                | 16               | 5.9        |
| 12   | Early registered                          |                  |            |
|      | Yes                                       | 270              | 100.0      |
|      | No                                        | 0                | 0          |
| 13   | Number IronFolicAcid (IFA) tablet received |                  |            |
|      | 100 tablet                                | 218              | 80.7       |
|      | 200 tablet                                | 52               | 19.3       |
| 14   | Regular intake of IFA tablet              |                  |            |
|      | Yes                                       | 218              | 80.7       |
|      | No                                        | 52               | 19.3       |
| 15   | Deworming done                            |                  |            |
|      | Yes                                       | 216              | 80.0       |
|      | No                                        | 54               | 20.0       |
| 16   | Parenteral iron received                  |                  |            |
|      | Yes                                       | 35               | 13.0       |
|      | No                                        | 235              | 87         |
| 17   | Any pregnancy complication                |                  |            |
|      | No complication                           | 252              | 93.3       |
|      | Pregnancy Induced Hypertension            | 2                | 0.7        |
|      | Fever                                     | 2                | 0.7        |
|      | Gestational diabetic                      | 7                | 2.6        |
|      | Mal presentation                          | 6                | 2.2        |
|      | Multiple pregnancy                        | 1                | 0.4        |
Table 3. Illustrates the prevalence of anaemia among the study participant

| S no. | Disease | Frequency | Percent [± 1-3] |
|-------|---------|-----------|----------------|
| 1     | Anaemia | 112       | 41.5           |

Table 4. Anaemia in relationship to gravidity in the study participants

| Gravidity       | Number | Anaemia | Frequency [± 1-3] |
|-----------------|--------|---------|------------------|
| Primigravida    | 183    | 76      | 41.5%            |
| Multigravida    | 87     | 36      | 41.4%            |

Table 5. Association of obstetric factors with anaemia

| S. NO. | Factors         | N  | Anemia | XL  | OR   | 95%CI | P Value |
|--------|-----------------|----|--------|-----|------|-------|---------|
| 1      | Parity          |    |        |     |      |       |         |
|        | Multigravida    | 87 | 36     | 41.4| 0.0  | 0.994 | 0.5-1.6 | 0.981 |
|        | Primigravida    | 183| 76     | 41.5| 53.9 | 0.7   | 0.03-0.1 | 0.001 |
| 2      | IFA current     |    |        |     |      |       |         |
|        | Irregular       | 218| 67     | 30.7| 12.4 | 0.3   | 0.14-0.6 | 0.001 |
|        | Regular         | 52 | 45     | 86.5|      |       |         |
| 3      | DEWORMING       |    |        |     |      |       |         |
|        | Not done        | 54 | 11     | 20.4|      |       |         |
|        | Done            | 2.IG | 101   | 46.8|      |       |         |

The collected data were analysed using SPSS software version 16. A total number of 270 pregnant women residing in the Sripuram area have been interviewed with a predesigned, pretested proforma. A detailed demographic and obstetric profile of the women along with the haemoglobin level in their each visit was taken from their mother child protection card. Karin Gross et al., in his study used similar technique and obtained data from mother child protection card. As defined by this study the age distribution of the study participant were between 15 to 35 years, majority belong between 15 to 24 years (48.5%). In this study proved that mothers who have short monthly family income were three times more likely to be anemic as associated to those with high monthly family income. This is in agreement with some studies and contradicted to other reports. According to the 2007 Ethiopian central statistical agency household income ingestion and expenditure survey, more than 57% of the total expenditure is spent on food [18]. Similar studies done by Meseret Alem et al. , 21 Ethiopia 2013, 49.5% of the participant were in the age group 18-25. In another study done by L.H.Madhavi, Karnataka, India, 2011 reported that Maximum percentage (37.61 %) of women was in the age group of 20-24 years. Furthermore, in this study, 80% of study participants were from south east area suggesting that they are food net buyers. As income is low, the expenditure for food becomes low. Also, due to food price inflation, the obtaining power of income is low. So, low income groups did not get acceptable nutrition and thereby low family income groups were at risk of anemia. In this study, supplementation of iron sulphate, folic acid, and multivitamin throughout the present-day pregnancy period organized not expressively diminish the incidence of anemia as compared to those who did not take these supplementations. Finally, outcome was in contradiction with other studies [19-23].

4. CONCLUSION

The prevalence of anaemia among pregnant mothers carried out in rural field practising area of Sree Balaji medical college was 41.5%. The
prevalence of anaemia among primigravida (41.5%) and multi gravid (41.4%) was almost equal. About 50% of the participants were anaemic in the first trimester, 38% in the second trimester and 42.9% of them were anaemic in the third trimester. In this study passive smoking (0.004), diet (0.009), consumption of iron folic acid (p 0.0001) and deworming (p 0.0001) were found to be significantly associated with anaemia. Factors like age (p 0.190), education (p 0.132), type of family (p 0.539), toilet facility (p 0.221) and parity (0.981) were not significantly associated with anaemia.

CONSENT

Informed consent in the local language (Tamil) was obtained from the study participants before administering the questionnaire.

ETHICAL APPROVAL

The study w) 1: approved by institutional ethics committee of Sree Balaji Medical College dated 28/06/2014. (Reference No. 002/SBMC/IHEC/2014-88)

COMPETING INTERESTS

Author has declared that no competing interests exist.

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