

## A STUDY ON THE PREVELANCE AND DEMOGRAPHIC FACTORS DETERMINING ANAEMIA AMONGST ADOLESCENT GIRLS (15-19) YEARS IN RURAL AREA OF KAMRUP DIST ASSAM.

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### ABSTRACT

**Background:** Anaemia in adolescent girls is a significant public health problem in India and more so in the rural areas. In an ICMR multicentric study conducted in 2001 in 17 districts over India, the overall prevalence of anaemia in adolescent girls was reported at the range of 60% to 90%. The negative consequences of anemia are well documented in adolescent girls resulting in intergenerational consequence which is important from the public health point of view. **Objective:** To determine the prevalence of anaemia and its demographic factors amongst adolescent girls in the rural area in the age group of 15-19 years. **Materials and Method:** A cross sectional community based study was conducted among 190 adolescent girls of 15-19 years, both unmarried as well married without ever being pregnant, for a period of one year from July 2010 to June 2011 by simple random sampling in the Rani Community Development Block, Kamrup district of Assam. Data was collected in a pre designed, pre tested structured schedule and Hemoglobin estimation was carried out by Sahli's Acid Haematin method. Statistical analysis was done by Chi-Square test. **Results:** The overall prevalence of anaemia in the study is 86.32% with a high prevalence (64.63%) of mild degree of anaemia. There is a significant association of anaemia in relation to caste, occupation of the head of the family and educational status of the mother. No significant association is found in relation to age, type of family and religion.

### INTRODUCTION

Adolescents are our future generation. There are approximately 100 million girls between the ages of 10-19 years in India and out of this; about 9.7% of the population is represented by the 15-19 year age group [1]. Out of the estimated two billion anaemic people worldwide, there are around 27% of adolescents who are anaemic in developing countries in comparison to the 6% in the developed countries [2].

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It is a significant public health problem in India. An ICMR multicentric study that was conducted in 2001 estimated that the overall prevalence of anemia in adolescent girls, particularly in the rural areas ranged from 60% to 90% in 17 districts of India [3]. In Assam, the prevalence of anaemia in adolescent girls in the age group of 15-19 years is high and has remained constant as evident from the National Family Health Surveys 2 and 3 [4,5]. The overall prevalence of anaemia reported in Assam amongst the 15-19 adolescent girls is 69.6%, with 47.9% having mild anaemia, 16.6% moderate anaemia and only 3.3% high degree of anaemia. Anaemia is a condition that



occurs when there is a decrease in the haemoglobin level in the blood and/ or decrease in the total volume of red cells below normal for the person's age and sex group. The estimated Hb cut-off level, expressed in gram per dl is at below 12 g/dl for determining anemia in adolescent girls [6]. Countries or population groups with at least 40% prevalence rate of anaemia are categorized as "high", 15-40% as "moderate" or of "medium" magnitude, and less than 15% as "low magnitude" [6]. The many causes of anaemia in adolescent girls are the increased physiological demand during growth spurt, loss during menstruation and inadequate dietary intake of iron. This is determined by the economic, education and occupational status of the parents, environmental sanitation and poor hygiene, gender discrimination in allocation of intra household food and household responsibilities. Diseases like Malaria and Parasitic infestations are also the other major contributing factors.

The many effects of anemia in adolescent girls have been well documented from various studies. Anaemia in an adolescent girl reduces her work performances and work output (Nelson M 1993) [7]. All of these have an impact on the socio economic development of a country. According to Senderowitz (1995) an adolescent girl with anaemia will enter her active reproductive years in late adolescence period with poor iron status and as many as 25% will have their first child by age 19 resulting in miscarriages, premature births, low birth weight babies and maternal mortality during childbirth [8].

Hence, from the public health point of view, it is important to ascertain the pre-pregnancy anaemic status of adolescent girls. Therefore, the present study was undertaken to highlight the demographic factors associated with anaemia amongst adolescent girls in the age group of 15-19 years in the rural areas of Kamrup district, Assam.

## MATERIALS AND METHODS

**Study Design:** Community based cross sectional study

**Study Area:** The study was carried out in the Rani Community development block of Kamrup District, Assam which is situated 28 kms from Guwahati city. As per the data from the office of the Rani Block Development Officer (BDO), the total no of revenue villages under the block is 96(2001 census). About 14% of the population is Tribals and 80% of the populations are Hindus while the rest are Muslims and Christians. This Block is under the Reorientation of Medical Education (ROME) Scheme of Gauhati Medical College, Guwahati, Assam.

**Study Period:** The study was carried out for a period of one year (15<sup>th</sup> July 2010 -14<sup>th</sup> June 2011)

**Study Population and Sample Size:** Adolescent girls in the age group of 15-19 years both married without being ever pregnant, and unmarried comprised of the study population. This age group corresponds to the mid and late

adolescence stage as per the classification recommended by WHO (1975). Adolescent girls in the mid and late adolescent stage were chosen as the study population in order to ensure cooperation and there by elicit a good response from them during the study. Based on the prevalence of anaemia at 67.7% and permissible level of error as 10%, the total sample size for the study was estimated using the formula  $4pq/L^2$ . Out of the total 96 revenue villages in the block (as per 2001 census), 19 villages were selected by simple random sampling method and 246 adolescent girls were identified from these villages. 190 adolescent girls in the age group of 15-19 years fulfilling the inclusion criteria and consenting for haemoglobin estimation were included in the study.

Married adolescent girls who had conceived earlier, prior to the study or were currently pregnant at the time of the study were excluded. The study was conducted in each village by house to house visits.

From those selected villages where the required number of adolescents could not be enrolled, the next adjoining village or villages were included. The parents or guardians as well as the respondents were briefed about the purpose and nature of the study and an informed consent was obtained from them.

Detailed information on demographic factors like age, etc were collected on a predesigned, pre tested structured schedule containing both open and close ended questions. Sahli's Acid Haematin method was used for haemoglobin estimation and anaemia was classified as per WHO (1998) [6]. This method was adopted for operational feasibility and cost effectiveness. In order to minimize the degree of error, a minimum of three readings was observed in the same solution and by taking the average of these three readings, the final reading was obtained [9]. Based on the findings of the haemoglobin level, the respondents were advised accordingly to visit the nearest health facility with the assistance of health workers from the Rani Community Health Centre.

The data collected were compiled and the results so obtained were presented in the form of tables, diagrams and subjected to statistical analysis with Chi-Square tests wherever it applicable.

## RESULTS

A total of 190 girls in the age group of 15-19 years participated in the study. Majority (50.00%) were in the age group between 16 to 18 years. 95.26% of the girls were Hindus and 43.16% were Scheduled Tribes followed by 32.10% and 10.53% from the General and Scheduled Castes respectively. 51.57% of the study respondents had middle and high school education with only 3.68% being high school passed. Majority (98.95%) were unmarried girls in the age group of 15-19. The prevalence of anaemia was 86.32% in the present study out of the 190 adolescent girls in the age group of 15-19 years. The overall prevalence of mild degree of anaemia was (64.63%)



followed by (34.36%) of moderate anaemia and (0.61%) of severe anaemia. The classification and severity of anaemia in this study were determined as per WHO (1998) criteria.

Out of the total 164 anaemic girls, a majority (48.17%) of the adolescent girls were from the scheduled tribes category. The study revealed a very high prevalence (96.34%) amongst the tribal adolescent girls and a significant association ( $p < 0.01$ ) with anaemia was observed as shown in Table 2. In relation to the occupation of the head of the family, the prevalence of anaemia was (94.74%) in girls from cultivator families and (88.89%) in

girls from families of daily wage earners and there was a significant association ( $p < 0.05$ ) observed. The prevalence of anaemia was (100.00%) amongst the girls of illiterate mothers and significantly high (92.91%) among those girls whose mothers had primary level school education as shown in table 3. A significant association ( $p < 0.05$ ) was observed between mother's educational status and the prevalence of anaemia in the study. No significant association of anaemia was observed in relation to the age, religion and the type of family of the adolescent girls ( $p > 0.05$ ) in the present study.

**Table.1: Distribution of Anemia in Adolescent girls (15-19) yrs according to Hb in Gm/dl**

| Hb. In gm/dl | Respondents |        |
|--------------|-------------|--------|
|              | No.         | %      |
| * $< 12$     | 164         | 86.32  |
| * $\geq 12$  | 26          | 13.68  |
| Total        | 190         | 100.00 |

N.B.:\* Criteria of Anemia in adolescent girls as per WHO guideline (1998)  
Cut-off level:  $< 12$  is anemia,  $> 12$  is no anemia

**Table 2: Distribution of Anemia in adolescent girls (15-19 years) according to Caste**

| CASTE                       | Anaemic |       | Non Anaemic |       | Chi-square value                                    |
|-----------------------------|---------|-------|-------------|-------|---|
|                             | No.     | %     | No.         | %     |   |
| General (n = 61)            | 49      | 80.33 | 12          | 19.67 | <b>X<sup>2</sup>=13.82,df=3, p&lt;0.01, p=0.003</b> |
| Scheduled Caste (n=20)      | 14      | 70.00 | 6           | 30.00 |   |
| Scheduled Tribe (n=82)      | 79      | 96.34 | 3           | 3.66  |   |
| Other backward Class (n=27) | 22      | 81.48 | 5           | 18.52 |   |
| Total                       | 164     | 86.32 | 26          | 13.68 |   |

**Table 3: Distribution of Anemia among Adolescent girls (15-19 years) according to Occupation and Educational status of the family**

| Occupation of head of the family | Anaemic (N=190)       |       | Chi-square test                                    |   |
|----------------------------------|-----------------------|-------|--|---|
|                                  | No.                   | %     |  |   |
| Cultivator                       | 72                    | 94.74 | <b>X<sup>2</sup>=10.58, df=4, p&lt;0.05 p=0.03</b> |   |
|                                  | Daily wage earner     | 16    |  | 88.89   |
|                                  | <b>Service</b>        | 40    |  | 83.33   |
|                                  | Business              | 18    |  | 72.00   |
|                                  | Others                | 18    |  | 78.26   |
| Total                            | 164                   | 86.32 |  |   |
| Education of Mothers (N=184*)    | Illiterate            | 31    | 100.00   | <b>x<sup>2</sup> =11.75, df= 4, p &lt; 0.05, p=0.01</b> |
|                                  | <b>Primary School</b> | 59    | 92.19  |   |
|                                  | Middle & High School  | 55    | 80.88  |   |
|                                  | HSLC Passed           | 10    | 71.43  |   |
|                                  | HS Passed and above   | 6     | 85.71  |   |
|                                  | <u>Total</u>          | 161   | 87.50  |   |

\*- six respondents whose mothers were not alive at the time of the study.

**Table 4: Distribution of Anemia among Adolescent girls (15-19 years) according to Age and Type of family**

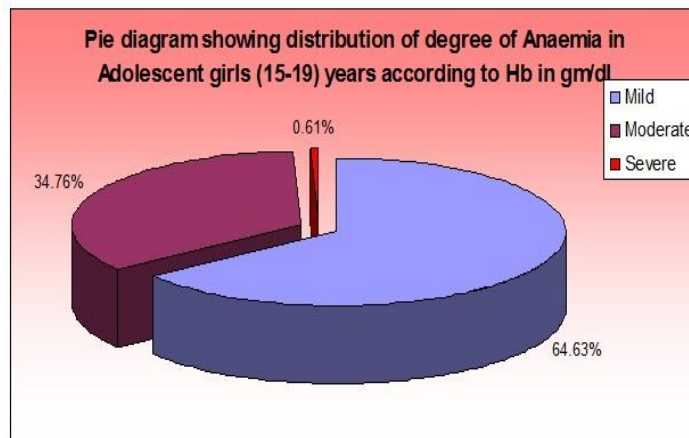
| AGE IN YEARS | Anaemia (N=190) |       | Chi-square value                                    |
|--------------|-----------------|-------|---|
|              | No.             | %     |   |
| * $> 14-16$  | 27              | 84.38 | <b>X<sup>2</sup>=0.153<br/>p&gt;0.05<br/>P=0.92</b> |
| 16-18        | 82              | 86.32 |   |
| 18-20        | 55              | 87.30 |   |



|                |         |     |       |                              |
|----------------|---------|-----|-------|------------------------------|
|                | Total   | 164 | 86.32 |                              |
| Type of family | Nuclear | 105 | 85.37 | X=0.26,df=1,p>0.05<br>P=0.61 |
|                | Joint   | 59  | 88.06 |                              |
|                | Total   | 164 | 86.32 |                              |

\* Age criteria-Girls who are over 14 years of age and less than 16 completed years of age

**Figure 1: showing distribution of degree of anemia in adolescent girls (15-19) yr**



## DISCUSSION

The present study observed a significantly high prevalence (86.32%) of anaemia among the adolescent girls in the age group of (15-19 yrs) and as per WHO definition it is a public health problem in the study area. Reports from studies conducted in India have shown similar results with a very high prevalence ranging from (93.96%-94.6%) [3], (82.9 % - 92.7 %) [10] and (59.8%) [11] amongst adolescent girls respectively. However, there were some studies [12,13] which reported a comparatively low prevalence of (34.5%) and (30.47%) anaemia in adolescent girls. The varying results of the prevalence of anaemia in the present study in comparison to the other studies can be attributed to different study setting and socio demographic backgrounds of the adolescent girls.

In the present study, there was an overall high (64.63%) prevalence of mild degree of anaemia and prevalence of severe anaemia was found to be (0.61%). Another study by Dutt R [14] observed a high prevalence (54%) of mild anaemia among the rural adolescent girls.

The negative effects of mild and moderate anaemia contribute to reduced physical capacity and poor academic performance on the adolescent girls. This in turn has a social and economic impact at the household level as well as on the community on the whole. The current study observed a significant association of anaemia with caste of the adolescent girls ( $p<0.01$ ), with a high prevalence (96.34%) amongst the Tribal adolescent girls followed by (81.84%) in the Other Backward Class (OBC) category .A similar finding was observed in a study [16], where the prevalence of anaemia was found to be (72% to 74.8%) respectively in the mid and late adolescent Tribal girls.

However, in another study [12] no significant association was found between caste and the prevalence of anaemia among rural adolescent girls.

The high prevalence of anaemia among the tribal girls in the present study can be attributed to factors like the environmental, socioeconomic and cultural influences on their way of living and their dietary habits.

A statistically significant association ( $p<0.05$ ) of anaemia with occupation of the head of the family was observed in the present study ( $p<0.05$ ). The prevalence of anaemia was found to be comparatively less amongst the adolescent girls where there is a steady source of income in the household. The findings of this study can be corroborated with that of other studies [12,14], which also reported a significant association between anaemia and occupational status respectively. In the present study there is a significant association ( $p<0.05$ ) of anaemia with mother's education. The prevalence of anaemia was (92.31%) amongst those with middle and high school level education followed by (100.00%) whose mothers were illiterate respectively. A similar significant association ( $p<0.05$ ) [17] was also observed between the prevalence of anaemia and mothers educational status. This emphasizes the important role of the mothers in the prevention and control of anaemia in a rural setting.

No significant association of anaemia was observed with age, religion and type of family in the present study. This is similar to the observation made by R Gawarikar [15]. However, study by Rawat [12] reported a significant association of anaemia ( $p<0.001$ ) with type of family. The association of anaemia in relation to the type



of family can be contributed by the intra household food distribution, for an adequate dietary intake in the adolescent girls.

### CONCLUSION

The present study observed a high prevalence of anaemia (86.32%) and an overall high prevalence

(64.63%) of mild anemia with a significant association of caste, occupation and educational status of mothers. These factors are amenable, for the prevention and control of anaemia at the community level as a long term measure.

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