Available Online at www.jddt.in

ISSN: 2320 - 4230

*Journal of Drug Discovery and Therapeutics* 2 (23) 2014, 04-07

RESEARCH ARTICLE

# PREVALENCE OF ANEMIA AMONG TWO INDEPENDENT GROUPS OF ADOLESCENT GIRLS-PRE MENARCHE AND POST MENARCHE

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**Received 20 October 2014; Accepted 28 October 2014**

**ABSTRACT**

**Back ground**: Anemia is a serious health issue for women and young children. It is ignored in most developing countries even though it is one of the most prevalent public health problems and has serious consequences for national development.

**Aims and objectives:** 1) To find out the prevalence of anemia among adolescent girls of 10-15 years of age. 2) To compare the anemic status between pre menarcheal and post menarcheal girls. 3) To correlate the findings with socio-demographic variables.

**Materials and methods**: 500 girls of 10- 15 years were selected from Government girls' higher secondary school, Chidambaram. Details regarding socio-demographic variables and menstruation were collected using pre tested proforma and haemoglobin was measured by cyanmethemoglobin method.

**Results**: Prevalence of anemia was found to be 58%. 73.9% of the post-menarcheal girls were anemic. There is a statistical association between haemoglobin and age, personal hygiene, body mass index and menarcheal status.

**Conclusion:** Higher prevalence of anemia among post menarche can be explained by the fact that menstrual blood loss is a significant parameter of anemia.

**Key words**: adolescents, anemia, menarche, Body Mass Index.

## INTRODUCTION:

In India 74% of children and over 50% of adolescent girls and women of reproductive age are anemic. A severe public health problem exists when anemia prevalence is more than 40% in any age group.[1] Prevalence of anemia is disproportionately high in developing countries due to poverty, inadequate diet, certain disease, pregnancy and lactation and poor access to health services. [2] Anemia begins in childhood, worsens during adolescence in girls and gets aggravated during pregnancy. [3,4]Adolescence being the phase of rapid growth, has an increase demand for iron requirement in both boys and girls but more so in girls because of menstruation. Anemia not only affects the present health status of girls but also has deleterious effects in future pregnancy, that puts the women at three times greater risk of delivering low birth weight and 9 times higher risk of perinatal mortality, thus contributing significantly for increased infant mortality rate and 30% maternal deaths.[5] Though there are various factors that contribute to the prevalence of anemia, the current study has helped to narrow down the major contributors such as BMI, socio economic status, age, personal hygiene and menstrual discharge. This study is planned to find out the prevalence of anemia among adolescent girls and compare the hemoglobin status among two independent group of girls i.e. pre menarche versus post menarche.

**Aims and objectives:**

1) To find out the prevalence of anemia among adolescent girls of 10-15 years of age.

2) To compare the anemic status between pre menarcheal and post menarcheal girls.

3) To correlate the findings with socio-demographic variables.

**Materials and methods:** A descriptive study was carried out in a Government higher secondary school of Chidambaram. The prevalence of anemia was 60% according to previous study done by S.Kaur et al.,[6] in Wardha. With that, the sample size in the present study was arrived by the formula $n=Z^2pq/d^2$. A total of 500 girls were included in the study in order to obtain an almost equal sample of pre and post menarcheal girls. The Government girls' higher secondary school was selected as convenient sampling with total students of 3078. The class 6, 7, 8 & 9 were selected. Individuals with atleast duration of more than one year after attainment of menarche were included in the study. Study subjects



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were selected by simple random sampling till the sample reached 500 in number. Haemoglobin was assessed by cyanmethaemoglobin method. Same lab technician and same instrument were used for the whole study.

**Data analysis:** The data was subjected to statistical analysis using the package of SPSS 20.0 version. The statistical test used to determine the attributes include descriptive statistics and chi square test. The level of significance was fixed at 5%.

**Results:** Out of 500 girls surveyed 292 girls (58.4%) were found to be anemic. Majority were in the age group of 11 years (39.6%) and 14 years (33.6%). Out of the 500 girls, 249 (49.8%) have attained menarche. 41.8% belong to IV class based on modified BG Prasad classification of socio economic status. None of the girls had any symptoms except for 5.4% who had loss of appetite. 26.8% was found with pale conjunctiva. The Prevalence of anemia among the girls who attained and not attained menarche was 73.9% and 43% respectively. 78.4% of anemic individuals have very poor personal hygiene. There was no statistical significant association between anemia and variables such as birth order, socio economic status of the family, age at onset of menarche and usage of sanitary latrine. A statistically significant association was found between anemia and variables such as age, personal hygiene, BMI and menarche status.

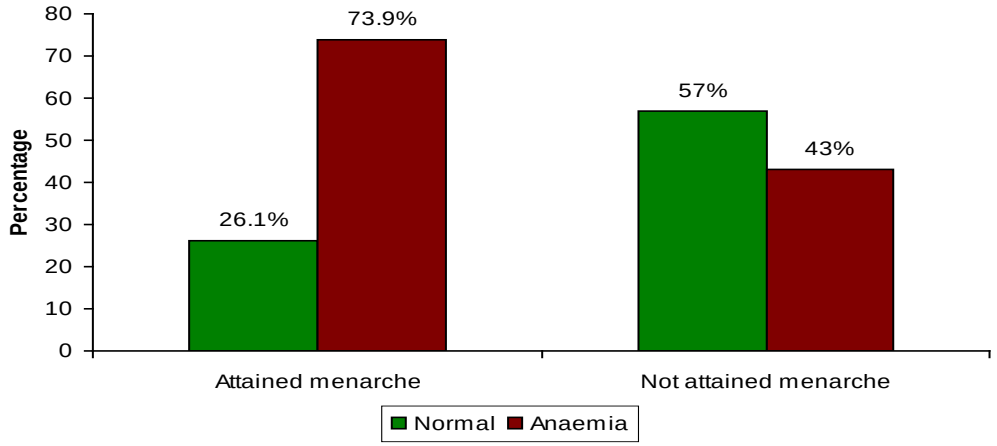


**Figure No. 1: Proportion of anemia among the girls who attained menarche and not attained menarche**

**Table no 1: Correlation of anemia status with select socio demographic variables**

| Socio demographic variables | | Anemia Status | | | | Chi-Square | P Value |
|---|---|---|---|---|---|---|---|
| | | Absent | | Present | | | |
| | | No | % | No | % | | |
| Age | ≤ 12 years | 143 | 56.5 | 110 | 43.5 | 46.94 | <0.001 |
| | ≥13 years | 65 | 26.3 | 182 | 73.7 | | |
| Birth Order | 1st child | 99 | 39.1 | 155 | 60.9 | 1.67 | 0.433 |
| | 2nd child | 71 | 43.3 | 93 | 56.7 | | |
| | >3rd child | 38 | 46.3 | 44 | 53.7 | | |
| Socio economic status category based on per capita income | I* (Rs 5571 and above) | 3 | 60 | 2 | 40 | 2.09 | 0.553 |
| | II* (Rs 2786-5570) | 9 | 28.1 | 23 | 71.9 | | |
| | III (Rs 1671-2785) | 31 | 47 | 35 | 53 | | |
| | IV (Rs 836-1670) | 86 | 41.1 | 123 | 58.9 | | |
| | V (Below Rs. 836) | 79 | 42 | 109 | 58 | | |
| Personal Hygiene | Nails-neat clean | 187 | 46.4 | 216 | 53.6 | 19.71 | <0.001 |



 

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dirty | 21 | 21.6 | 76 | 78.4 | | |
| Usage of Sanitary Latrine | Using | 139 | 44.4 | 174 | 55.6 | 2.718 | 0.099 |
| | Not using | 69 | 36.9 | 118 | 63.1 | | |
| Menarcheal Status | Attained | 65 | 26.1 | 184 | 73.9 | 49.02 | <0.001 |
| | Not attained | 143 | 57 | 108 | 43 | | |
| Post menarche duration | 1 year | 48 | 27.3 | 128 | 72.7 | 0.934 | 0.628 |
| | 2 years | 12 | 26.1 | 34 | 73.9 | | |
| | ≥3 years | 5 | 18.5 | 22 | 81.5 | | |
| No. of days bleeding | 1 – 3 days | 11 | 21.2 | 41 | 78.8 | 1.479 | 0.477 |
| | 4 – 6 days | 44 | 28.8 | 109 | 71.2 | | |
| | 7 – 9 days | 10 | 22.7 | 34 | 77.3 | | |
| Frequency of cycle | Regular | 58 | 25.7 | 168 | 74.3 | 0.246 | 0.62 |
| | Irregular | 7 | 30.4 | 16 | 69.6 | | |
| Body mass index | Under weight | 11 | 30.6 | 25 | 69.4 | 6.37 | 0.041 |
| | Normal | 156 | 40.3 | 231 | 59.7 | | |
| | Over weight & Obese | 41 | 53.2 | 36 | 46.8 | | |

*For statistical purpose I & II are combined.

**DISCUSSION:**

This descriptive study was conducted among 500 school girls aged 10 to 15 years from Government girls' higher secondary school, to find out the prevalence of anemia and also to correlate influence of menstrual blood loss and other socio demographic variables on the hemoglobin status of adolescents.

Out of 500 study subjects aged 10- 15 years, 50.4% of them were 10-12 years and 49.6% were 13-15 years of age. Majority (41.8%) belonged to IV category of modified BG Prasad classification of socio economic status. Prevalence of anemia was found to be 58.4% in this study. Similar prevalence (55%) was observed in NFHS-3 and 55.9% in a study done by Rajini et al.[7,8] The present study shows statistical association between age and the haemoglobin. Similar finding have been observed in a community based study by F.E.I.Shan et al., (2000).[9]

In this study majority of girls have attained menarche at 13 years. Similar findings were observed by Rajarathinam et al., (1998), in which the mean age at menarche was 13.5 years ± 1.03 years. [10] The present study showed no correlation between age at menarche and the hemoglobin status. Similarly Mehta et al., and Kotecha et al., have reported that age at menarche is not a significant correlate of anemia.[6,11] Prevalence of anemia in post menarcheal girls were much higher compared to the pre menarcheal girls (73.9% vs 43%) this difference was statistically significant. Similar finding was observed in a study done by Rajarathinam et al., which documented a higher prevalence of anemia in girls who attained menarche (42.5%) compared to girls not attained menarche (40%) which is in contrast with the study done by Robert T Jacson et al.[10,12]

The present study showed no significant association between the socio economic status of the family and the haemoglobin level which is in accordance with the study done by Rajini et al., and in contrast to Rajarathinam et al.[8,10] There is no significant association observed between Hb status and the birth order of the girl in the present study which is in contrast to a study done by Rakesh Kumar Singh et al.[13] Similarly in a study done by Sinha et al., showed a positive correlation between anemia and birth order. [14] In the present study there is a statistical association between Hb status and personal hygiene which is similar to a study done by S.Goel et al.[15] In the present study there is a statistical significant association between the BMI and the haemoglobin status which is similarly observed by Gillium et al., and in contrast to this, Rita Singh et al., has observed a negative correlation between the BMI and the haemoglobin concentration. [16,17]

**CONCLUSION:**

Prevalence of anemia in adolescent age is high. Difference in nutritional needs widens after the onset of puberty. Higher prevalence of anemia among post menarche can be explained by the fact that menstrual blood loss is a significant parameter of anemia.

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