# RESEARCH ARTICLE

## ANEMIA DISTRIBUTION AMONG BANGALORE  ADOLESCENTS

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**Abstract:**
Anaemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development**.** To evaluate the distribution of anaemia among early, middle and late adolescents. **Methods:** It's a hospital based descriptive study. Adolescents attending outpatient and inpatient at paediatrics department in Rajarajeswari Medical College and Hospital, participated in this study. Total of 80 anaemic adolescents were studied. During the period of December 2013 - 2014. After obtaining ethical committee acceptance. The statistical analysis is made by using student t test and chi-square/Fisher Exact test. **Results :**In 80 anaemic adolescents studied, 68.8% were females and 31.3% were males. 50% of the adolescents in the study group belonged to middle adolescence, which is of statistical significant. In this study, moderate anaemia according to WHO classification of anaemia was 38.8% which is higher than mild and severe anaemia. **Conclusions :**Anaemia is more common in females, middle adolescent group and moderate anaemia is more frequent.
**Keywords:** anaemia, adolescents.

## INTRODUCTION:

Anaemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development.[1]
Adolescence is a period of transition from childhood to adulthood, during which certain health problems and risk behaviours prevalent during this period influence their future health.[2]
Iron deficiency anaemia is the most common nutritional anaemia affecting more than 2 billion people worldwide.[3] It can have profound negative impact on psychological and physical development, behaviour and learning performance, working capacities and reproductive health.[4] It can result from inadequate iron intake, reduced bioavailability of dietary iron, increased need for iron, chronic blood loss and parasitic infections.[5] Adolescents of both sexes are particularly vulnerable for developing anaemia because of rapid growth and girls additionally because of the onset of menstruation. Despite strong reasons focusing on anaemia on adolescents, only little research was done.
**Prevalence**
A study of health and family welfare (2000) showed point prevalence of anaemia in various age groups and was found to be high in both sexes. In adolescents, the prevalence rate of anaemia was very - very high i.e., 65.8 percent in boys and 81.3 percent in girls. [6]

## METHODS

It's a hospital based descriptive study. Adolescents attending outpatient and inpatient at Rajarajeswari Medical College and Hospital, participated in this study as per the inclusion and exclusion criteria.

**Inclusion criteria:**
- Age group: 10 - 19 years.
- Those who full fill the WHO criteria for anaemia.

Adolescent male — less than 13 gm% of haemoglobin.

Adolescent female less than 12 gm% of haemoglobin.

**Exclusion criteria:** Adolescents with
- Hemolytic anaemia
- Who are not willing to give consent
- Anaemia due to acute blood loss
- Bone marrow suppression.

Written informed consent of the child's parent or legally accepted representative will be obtained. Then blood will be drawn and haemoglobin will be estimated by an automated analyser followed by a peripheral blood smear.

Anaemia was graded as:[7]
- Mild: Hb% above 10gm/dl and less than 12gm/d1.
- Moderate: Hb% between 7 gm/dl and 10gm/d1.
- Severe: Hb% lesser than 7 gm/dl.

## Sample size

The estimated prevalence of anaemia among adolescent girls as per National Family Health Survey is 56% [8] considering this by using the formula $n=4pq/l2$ and the allowable error of 20% the estimated sample size will be 80.

## Statistical Methods

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD (Min-Max) and results on categorical measurements are presented in Number(%). Significance is assessed at 5% level of significance. The following assumptions on data is made:

Assumptions:
1. Dependent variables should be normally distributed,
2. Samples drawn from the population should be random, Cases of the samples should be independent.

Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters.

Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

## Significant figures
- Suggestive significance (p value: $0.05<p<0.10$)
- Moderately significant (p value: $0.01<p<0.05$)

- Strongly significant (p value: p<0.01)

**Statistical software:** The statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0 and R environment ver.2.11.1 were used for the analysis of the data and Microsoft Word and Excel have been used to generate graphs, tables etc.

## RESULTS

**Table 1:** Age distribution of patients studied

| Age in years | No. of patients | % |
|---|---|---|
| 10 – 13 | 32 | 40.0 |
| 14 – 16 | 40 | 50.0 |
| 17 – 19 | 8 | 10.0 |
| **Total** | 80 | 100.0 |

Mean ± SD: 13.78±2.03

Out of 80 adolescents studied, 40% belonged to early adolescence, 50% belonged to middle adolescence and 10% belonged to late adolescence.

**Table 2:** Gender distribution of patients studied

| Gender | No. of patients | % |
|---|---|---|
| Female | 55 | 68.8 |
| Male | 25 | 31.3 |
| Total | 80 | 100.0 |

In the study population, 68.8% were females and 31.3% were males.

**Table 3:** Age distribution of patients studied

| Age in years | Gender | | Total |
|---|---|---|---|
| | **Female** | **Male** | |
| 10 – 13 | 19 (34.5%) | 13 (52%) | 32 (40%) |
| 14 – 16 | 28 (50.9%) | 12 (48%) | 40 (50%) |
| 17 – 19 | 8 (14.5%) | 0 (0%) | 8 (10%) |
| **Total** | 55 (100%) | 25 (100%) | 80 (100%) |

p=0.083+, Significant, Fisher Exact test

In early adolescence, 34.5% were females and 52% were males. in middle adolescence, 50.9% were females and 48% were males. In late adolescence, 14.5% were females. There is significant relation between middle adolescence and anaemia.

**Table 4:** Peripheral smear according to gender

| Peripheral smear | Gender | | Total |
|---|---|---|---|
| | **Female** | **Male** | |
| Microcytic hypochromic | 45(81.8%) | 21(84%) | 66(82.5%) |
| Macrocytic blood picture | 4(7.3%) | 2(8%) | 6(7.5%) |
| Dimorphic blood picture | 6(10.9%) | 2(8%) | 8(10%) |
| **Total** | 55 (100%) | 25 (100%) | 80 (100%) |

Of 80 adolescents in the study, 82.5 % account to microcytic hypochromic picture, 7.5% showed macrocytic blood picture and 10 % showed dimorphic blood picture.

## DISCUSSION

There are not many studies on anaemia in adolescents, out of 523 reviewed for World Health Organisation (WHO) in anaemia only 39 studies included adolescents. [9]

A study of health and family welfare (2000) showed point prevalence of anaemia in various age groups and was found to be high in both sexes. In adolescents, the prevalence rate of anaemia was very— very high i.e., 65.8 percent in boys and 81.3 percent in girls. [6]

A study done by Sahu ML[92] shows similar prevalence of anaemia among early and late adolescent males, and middle adolescent females. Moderate anaemia is more in this study comprising of 38.8%, it is similar to a study conducted by Rupali. [10]

## CONCLUSION

Nutritional anaemia is a burden on adolescent children, as it affects the transition of childhood to adulthood and it influences the future health.

Among all the adolescent groups, anaemia was more prevalent in middle adolescence, which is of statistical significance.

In this study, moderate anaemia according to WHO classification of anaemia was 38.8% which is higher than mild and severe anaemia.

### Merits

There are very few studies on nutritional anaemia among adolescent boys in south India, in this study adolescent boys were also included.

### Recommendation

Nutritional awareness education should be given to adolescents as they fear of gaining weight, irregular food habits, food faddism and decreased intake of green leafy vegetables/animal proteins.

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