PREVALENCE OF IRON DEFICIENCY ANAEMIA AMONG RURAL ADOLESCENT GIRLS - COMMUNITY BASED STUDY FROM TAMILNADU

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ABSTRACT

Introduction: The aim of the study is to determine the prevalence of Iron Deficiency Anaemia (IDA) among adolescent girls in rural areas and to study the association of IDA with respect to the age of the adolescent girls and their socio-demographic profiles. **Materials and Method: This** was a cross-sectional community based study, conducted on 979 adolescent girls (aged 13-17 years), staying at Manachanallur (Tk), Trichy district, between January 2016 and February 2017. Estimation of haemoglobin was carried out by cyanmethaemoglobin method. Statistical analysis was performed by using simple percentage method. **Results:** A total of 979 adolescent girls were evaluated for IDA. 397 adolescent girls had IDA and accounted for 40.55%. Most of adolescent girls who had IDA were related to the age 14 (23.23%). The prevalence of mild, moderate and severe IDA was 58.19%, 28.21% and 13.60% respectively. The prevalence of IDA was substantially high among the adolescents who were from low socio-economic status. **Conclusion:** Among adolescent girls, the prevalence of IDA was substantially high. Socio-economic status and parental illiteracy are the major factors that contribute to high prevalence of IDA.

Keywords: Prevalence, IDA, Adolescent Girls.

INTRODUCTION

Adolescence is a stage of conversion from dependent childhood to independent adulthood. According to World Health Organization (WHO), adolescents are the population of 10 to 19 years of age. The word adolescence originated from the Latin word, 'adolescere' which means "to grow, to mature." Adolescent population of India is 21% which numbers 253 million. Sizable number of adolescents face challenges to their healthy development due to various factors, such as poverty, social demarcation, negative social norms, and early marriage and child-bearing, especially in the marginalised and under-served sections of the population.

In a family with measured resources, the girl child is more likely to be ignored. She is underprivileged of having good food and better education, and also employed to carry out the household duties. In addition, menstrual blood loss precipitates the crises too often. In India, anaemia is one of the most familiar health problems which is much more widespread in the rural than in the urban areas. Anaemia is a nutrition problem worldwide and its prevalence is higher in developing countries when compared to the developed countries. Anaemia affects mainly women of child-bearing age, and adolescent girls. Adolescent girls are more prone to anaemia and malnutrition. Insufficient nutritional diet in adolescent age can have disastrous effects during their reproductive period. If adolescents are well nourished, they can make optimal use of their skills, talents and energies today, and be healthy and responsible citizens and parents of healthy babies tomorrow. Data from our country shows 25%-85% of anaemia among adolescent children. Majority of these studies are from rural areas.

In the present study we aimed to assess the prevalence of anaemia among adolescent girls and to probe socio-demographic variables among anaemic adolescent girls.

MATERIAL AND METHODS

Cross-sectional, Community based study conducted on 979 adolescent girls (aged 13-17years), attending schools at Manachanallur (Tk), Trichy district, between January 2016 and February 2017.

Inclusion criteria: Unmarried, non-pregnant, and non-lactating girls in the age group of 13-17 years were included in the study.

Exclusion criteria: Known cases of haemoglobinopathies, bleeding disorders, taking medications and chronic diseases were excluded.

Socio-economic status (SES) score was done by using the Modified Kuppuswamy scale. After obtaining written consent from the subjects and their parents/ guardians, a pre-test questionnaire was administered to collect information on basic demographic details. Clinical examination was also performed in brief using the observation checklist, which included signs and symptoms of iron deficiency anaemia. Estimation of haemoglobin was performed by the cyanmethaemoglobin method. Classification of the IDA according to its severity:

Iron Deficiency Anaemia	Hb (range in gm/dl)
Mild	10-11.9
Moderate	7-10
Severe	<7

RESULTS

Out of 979 adolescent girls evaluated for iron deficiency anaemia, 397 had IDA with a prevalence rate of 40.55%. Majority of participants, 118 (29.72%) who had anaemia belonged to the age 14, followed by the age 15 (24.44%) and age 13 (20.15%). In our study, least number of participants with anaemia belonged to age group of 16 and 17 which accounted only for 13.60 % & 12.09% respectively. (Table - 1).

Table - 1: Age wise distribution of anaemia among adolescent girls

Age in years	Anaemic Adolescent girls	Percentage
13	80	20.15
14	118	29.72
15	97	24.44
16	54	13.60
17	48	12.09
Total	397	100%

Based on haemoglobin level of IDA in adolescence, they were categorised into three groups. The prevalence of mild, moderate and severe IDA was 58.19%, 28.21% and 13.60% respectively. (Table - 2) below.

Table - 2: Severity of anaemia

Category	Iron Deficiency Anaemic adolescents	Percentage
Mild	231	58.19%
Moderate	112	28.21%
Severe	54	13.60 %
Total	397	100%

The prevalence of IDA among the girls who belonged to class IV (upper lower) was high which accounted for 49.12% followed by class II (upper middle) with 28.46%. Least number of IDA adolescent girls were from class III (lower

middle) with 22.42%. In the present study there was no participant from socio-economic strata I (upper) and V (lower). Other socio demographic details are listed in Table - 3.

Table 3: Socio demographic profile of anaemic adolescent girls

Socio demographic status	Number percentage
Socio economic status	
II (upper middle)	113(28.46%)
III (lower middle)	89 (22.42%)
IV (upper lower)	195(49.12%)
Father's Education	
Illiterate	207 (52.15%)
Primary	91(22.92%)
Secondary	60(15.11%)
Higher secondary and above	39(9.82%)
Religion	
Muslim	123(30.98%)
Hindu	274(69.02%)
Diet	
Vegetarian	261(65.74%)
Non vegetarian	136(34.26%)
Type of family	
Nuclear	162(40.81%)
Joint	235(59.19%)

DISCUSSION

In this study, the prevalence of IDA among adolescent girls was 40.55%. This result is matching with the observation of previous research by Chaudhary and Dhage (35.1%). And also the results are parallel to the reports of CMS Rawat et al. A study on nutritional status of adolescents from various countries by the International Centre for Research on Women (ICRW), showed 32-55% prevalence of IDA. In Nepal, the prevalence rate of anaemia was 68.8% among adolescent females. But, in the United States of America (USA) the prevalence rate of anaemia was only 2%. High prevalence rate was observed by J Rajaratnam et al. According to Al-Sharbati et al, high prevalence of anaemia was noted among adolescents of rural (12.9%) than urban (17.6%) areas. This study is not in agreement with the study conducted by Akramipour et al, in which anaemia was accounted for in 46.6%. Other Studies from rural parts of Wardha and Lucknow to assess the prevalence of anaemia among adolescent girls was found to be high and accounted for 59.8% and 56%, respectively. Studies from under developed countries such as Peru, Indonesia and Bangladesh, the prevalence of anaemia in girls has been found to be around 25-30%.

In our country, Jharkhand state showed highest prevalence of IDA, where approximately all adolescent girls were found to be anaemic. Least prevalence of IDA was found in the north-eastern part of country, due to high living standard of population in this region. Prevalence rate of IDA vary from region to region within the nation.

In the present study, mild IDA (58.19%) was frequently observed which was followed by moderate (28.21%) and severe IDA (13.60%). Similarly according to Rita singh, prevalence of mild IDA (19.4%) was observed frequently

followed by moderate (14.9%) and severe IDA (2.2%) while Rawat et al, reported 19.0 per cent mild, 14.1 per cent moderate and 1.4 per cent severe IDA. A study from Orissa conducted in three districts showed 96.5% of anaemia among non-school going adolescent girls. Narrow difference was noticed between mild (42.2%) and moderate IDA (46.9%). Severe IDA was noted among only 4.4 %.

According to the study conducted by Toteja GS et al, 90% prevalence of anaemia was found among adolescent girls and 7% of their participants belonged to category of severe IDA. Shield, et al, reported significant inverse association between hookworm egg count and haemoglobin level.

In this study, high prevalence of IDA was seen among girls who belonged to upper lower socio-economic groups (49.12%) as compared to upper middle (28.46%) and lower middle (22.42%). Study conducted by R. Gawarika et al, observed the IDA prevalence of 96.5% in weaker income groups and 65.18% in middle or higher middle group. Similarly Kapoor et al, also reported 56% prevalence in lower middle and 46% in high socio-economic group. This may be due to the availability of good nutritional diet among families of better socio-economic status. Intake of snacks and junk foods, which lack micro-nutrients may be the cause for anaemia among higher socio-economic category.

In the present study, majority of anaemic adolescents' fathers were illiterates. As per Rawat et al, 44% of participants were from labour families and also observed IDA in 43.2 per cent of adolescent daughters of illiterate mothers. Rawat et al, also showed higher prevalence of IDA among adolescent girls who had illiterate (42.2%) and just literate (40.3%) mothers, as compared to educated mothers.

Considerable association was noted between vegetarianism and anaemia which was similar to the findings by Verma, et al. The study conducted by Koc et al, in Şanlıurfa city demonstrated the effects of habitual food consumption on anaemia. In this region consumption of red meat is high and may be the cause for low prevalence of anaemia (1.5%). Religious issues and financial constraints may, however, pose a problem. In such a situation, they should be encouraged to take citrus fruits and vegetables, which will promote iron absorption. The germination of cereals and legumes prior to consumption will also improve iron absorption by increasing vitamin C and lowering tannins and phytates.

In this study, the Prevalence of anaemia was high among adolescents belonging to Hinduism (69.02%) than Muslim adolescents (30.98%). This is in agreement with the reports of Kakkar et al, may be due to the intake of vegetarian food with low bioavailability of iron.

This was a community based study and remained as limitation. Another limitation was, no stool examination was performed for the detection of intestinal parasites which may contribute to anaemia particularly among adolescents.

CONCLUSION

Among adolescent girls, the prevalence of anaemia was substantially high. Factors responsible for high prevalence of IDA are socio economic status, parental illiteracy. By giving timely prophylaxis along with enlightening the parents of adolescent girls will go a long way in improving their haemoglobin status.

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