



DIET ASSESSMENT AND ANAEMIA STATUS AMONG ADOLESCENT SCHOOL GOING GIRLS IN PUDUCHERRY POPULATION

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ABSTRACT

Anaemia is a major contributor to maternal death in developing countries. The rapid growth and changes that occur in adolescents increase the demand for macro and micronutrients and addressing their needs particularly in females would be an important step to break the vicious cycle of intergenerational malnutrition. To assess the diet profile and anaemia status among urban adolescent school going girls. The study was conducted 6 months duration in schools in Pondicherry. After obtaining informed consent, information regarding menstrual history, dietary intake (was assessed by 24 hours recall method), dietary nutrient intake, knowledge regarding iron-rich food and clinical examination of the selected participants was recorded in predesigned pre-tested sheet. Participants: 500 adolescent girls Study tools and technique: The questionnaire consists of sociodemographic data, menstrual history, dietary intake (was assessed by 24 hours recall method), dietary nutrient intake, and knowledge regarding iron-rich food and clinical examination of the selected participants. Hemoglobin was assessed by Sahli's method. For the purpose of statistical analysis, those with hemoglobin < 12g/dl were categorized as having anaemia and those with hemoglobin more than or equal to 12 g/dl were categorized as not having anaemia Results: The present study was conducted in different schools in Pondicherry. It included a total of 500 adolescent girls, aged 11-17 years. Out of the 500 girls, 350 (70 %) were in the age group of 11-14 years, whereas only 150 (30 %) were in the age group of 15-17 years. Significant association was found between dietary insufficiency of iron and presence of paleness. There is a need to initiate intervention measures to improve the nutritional status of adolescent girls who are the future 'mothers-to-be'. Hence, there is a need to create awareness among adolescents and their family about nutrition and health.

KEYWORDS : Hemoglobin; paleness ,Adolescent, Anaemia, Dietary intake

INTRODUCTION

According to World Health Organization (WHO), the global prevalence of anaemia is 24.8%, which means about 1.62 billion people worldwide. Anaemia due to iron deficiency is the most widespread clinical nutritional deficiency disease in the world today. The prevalence of anaemia is disproportionately high in developing countries due to poverty, inadequate diet, worm infestations, pregnancy/lactation and poor access to the health services [1]. Iron deficiency affects the cognitive performance, behaviour and physical growth of school-age children. Adolescents are the future generation of any country and their nutritional needs are critical for the well being of society. India is home to more adolescent than any other country. A large number of adolescents suffer from chronic malnutrition and anaemia, which adversely impacts their health and development [2].

Anaemia is the most common nutritional deficiency disorder in world. WHO has estimated that prevalence of anaemia in pregnant women is 14% in developed 51% in developing countries 65-75% in [1-2] India. About 1/3 of global population (over 2 billion, are anaemic.) In India anaemia ante dates pregnancy, is aggravated by increased requirements during pregnancy and blood loss at delivery, infections in the antenatal and postnatal periods, and the early advent of next [3] pregnancy perpetuates it. According to ICMR standards anaemia is [4] classified as mild (Hb 10.0 – 10.9 gm/dl); moderate (Hb 7.0 – 9.9 gm/dl); severe (Hb < 7.0 gm./dl) and very severe (Hb < 4.0 gm./dl) According to ICMR, the relative prevalence of mild, moderate & severe anaemia are 13%, 57% & 12% respectively in India. Women with chronic mild anaemia are well compensated. Women with moderate anaemia have substantial reduction in work capacity & may find difficult to cope with household chores and child care.

Due to dietary insufficiency of iron and faulty dietary habits ,weakness and poor concentration in studies leads to low performance in school. Severe anaemia in pregnancy impairs oxygen delivery to the foetus and interferes with normal intrauterine growth, resulting in intrauterine growth retardation, stillbirth, LBW and neonatal deaths. Therefore, anaemia is a major contributor to poor pregnancy and birth outcomes in developing countries as it predisposes to premature delivery, increased perinatal mortality and increased risk of death during delivery and postpartum[3].

Globally, anemia is the most common and inflexible nutritional problem affecting around 2 billion of the world's population having major impact on human health and social and economic development; and more than 89% of this burden occurred in developing countries [2, 3]. Accounting half of all cases, iron deficiency anemia is the most common cause of anemia. However, other conditions like nutritional deficiencies, acute and chronic inflammation, parasitic infections, growth spurt, increase in iron requirements, increased iron loss from the body during the menstruation, inherited or acquired disorders of hemoglobin synthesis, RBC production, or survival are also considered cause of anemia [1].

The prevalence of anaemia in India has been reported among females was 70.1%, which included 48.7% mild, 19.9% moderate and 1.5% severe anaemia cases [4]. The prevalence of iron deficiency anemia and those factors associated with it among adolescent girls is crucial for initiation of effective intervention that improve their nutritional status to prevent occurrence of different risks during their adolescence, pregnancy, child birth, and beyond. Anaemia is a multifactorial disorder that requires a multi-pronged approach for its prevention and treatment[1-10]. Different researchers have

conducted studies on anemia among adolescent girls from different part of the world. Hence this study assesses the dietary adequacy and anaemia status in adolescent school going girls. Iron reserve subsequently helps adolescent girls for better reproductive outcome. Nutritional anaemia due to iron and folic acid deficiency is a major public health problem. South Asia ranks among the regions, which have the highest prevalence of anaemia in the world and India perhaps has the highest prevalence of anaemia among the South Asian countries

MATERIAL AND METHODS

The Field area is set up with schools in and around chennai. Total 500 adolescent girls were present in the study area. All unmarried, non-pregnant, non-lactating adolescent girls(11-17years) were included in the study. After obtaining informed consent, information regarding menstrual history, dietary intake (was assessed by 24 hours recall method),dietary nutrient intake, knowledge regarding ironrich food and clinical examination of the selected participants was recorded in predesigned pre-tested sheet.

RESULTS

Table-I: Distribution of study participants in relation to dietary insufficiency of iron

Dietary sufficiency of iron	Number	Percentage
Insufficient	350	70
Sufficient	150	30

Study participants (n=500)

Table-II: Mean Age, Height, Weight and BMI of study participants

Anthropometric Measurements	NCHS	
	Mean ± SD	Value
Height (in Cms)	149.62 ± 5.16	161
Weight (in Kgs)	37.53 ± 9.24	50.3
BMI (Kg/sqmt)	16.26 ± 3.28	-

Table-III: Dietary prevalence

Dietary Prevalence	Number	Percentage
Vegetarian	100	20
Mixed	400	80

Study participants (n=500)

Table-IV: Distribution of study participants according to presence of paleness

Paleness	Dietary Iron Status		Total
	Insufficient	Sufficient	
Absent	85	190	275
Present	135	90	225
Total	220	280	500

DISCUSSION

The most vulnerable population groups to anemia are women of reproductive age groups particularly during pregnancy and lactation due to their increased demand for iron and other important nutrients [11]. Other important at risk groups are adolescents whose nutrient requirement increases during this period as a result of the rapid changes occurring in their physical dimension and body composition [12]. Since this period is often overlooked, adolescents are exposed to several forms of macro and micronutrient malnutrition [12- 13] and thus the period is the last opportunity to break the vicious cycle of intergenerational link of the nutritional problem . While the WHO estimate of global anemia among pregnant women and non-pregnant women aged 15-49 years is 42 and 30% respectively, the gap is wider in developed and developing countries. The prevalence of anemia is 14% in developed and 51% in sub Saharan countries of which half of the anemic cases are female adolescents [11-14].

The causes of anaemia are multifactorial. Nutritional requirement for iron in relation to the body size is higher during adolescence, because it is a period of rapid growth and development. During adolescence, iron deficiency not only reduces work productivity but also leads to iron deficiency during pregnancy. Therefore, targeting adolescent girls would not only have an immediate curative effect but may also have long term preventive effect of iron deficiency during pregnancy.

Nutritional status during adolescence plays an important role in the human life cycle [4]. The diet of children and adolescent must be adequate to support normal and sometimes very rapid growth and development [5]. Nutrition in general influences the growth and development throughout infancy, childhood and adolescence; it is, however, during the period of adolescence that nutrient needs are the greatest [6]. Remarkably, 84% of the adolescents are in developing countries [3, 7].

In view of the implications of iron deficiency on development, growth, health and work output of an individual and thereby, nutritional productivity, urgent steps are needed to control it [5]. The reasons for the high incidence of anaemia among the adolescent girls are: Increased iron requirements because of growth,menstrual loss, discrepancy between high iron need for haemoglobin formation and low intake of iron containing foods, Erratic eating habits, dislike for foods which are rich in iron, like green leafy vegetables,phytates/tannins [6]. One of the reason that the large size of the family can be related to low care for each family member and low family income to obtain variety of foods rich in iron and other micronutrients in those study areas.

Insufficiency of iron status

In the present study, it was found that out of 450 girls, 319 girls (70.88%) had dietary insufficiency of iron in their diet. In a multicountry study on the nutritional status of adolescents, which was carried out by the International Centre for Research on Women (ICRW), anaemia was found to be the most widespread nutritional problem and its prevalence ranged from 32-55%[7] . This might be due to low family income to obtain variety of foods rich in iron and there should be a means in which iron supplementation started for adolescent girls.

A one year crossectional study in Belgaum, Karnataka found 41.1% adolescent girls to be anaemic[8]. A study in adolescent girls and boys in Patiala revealed 98% of girls and 56% of boys to be anemic[9]. Similar study in adolescent medical students in Amritsar, Punjab showed 45.7% of girl students as anaemic [10].Previous studies were found anaemia in 98% of adolescent girls attending government schools in Jaipur, Rajasthan[10].

effects of anaemia

Among the clinical effects of anaemia, Paleness and weakness were found in 50 % and 80 % girls respectively. Similar results were found by a study with 68% paleness and 64% easy weakness [9] .

Anthropometric Measurements

Anemia is significantly associated with low BMI for age. The anthropometric measurement revealed that the average height of the girls ranged from 145-159 cms with the mean value being 149.62 ± 5.16 cm. The height was almost comparable to NCHS standard (Table 2)). Average weight of the girls ranged between 31-51 kgs with the mean value being 37.53 ± 9.24 kg. Results showed lower weight values when compared to NCHS standard (Table 2).Anthropometric data showed 32.66% of girls were underweight with BMI < 18.5kg/mtsq The disparity in anthropometric data might be

due to poor growth and development because of inadequate growth support due to inadequate dietary iron. Similar results were shown by study, where the height and weight of adolescent girls were compared to NCHS standard and weight was found to be lower. 44% of girls were found to be underweight in the study [8]. Study in Amritsar, Punjab found 18% of girls to be underweight [9].

iv) Dietary assessment

80 % girls had mixed diet whereas 20 % followed vegetarian diet. The general meal pattern showed that majority of girls consumed 3 major meals per day, breakfast, lunch and dinner. Only 16 % girls were consuming 2 meals per day by skipping breakfast. Consumption of tea and coffee were found in majority of the girls, 75 % population. They were consuming both morning and evening tea and some along with the meals. Higher tea and coffee intake hinders body's absorption of iron and might contribute towards inadequate iron status in adolescent girls. Diet was found to be poor in green leafy vegetables, milk and milk products, meat and poultry products. Study showed 14% female subjects consuming mixed diet, 16% of girls skipped breakfast, 34% of girls consumed more tea and coffee (11), and other studies also revealed higher tea and coffee consumption as well as inadequate intake of these food groups [10].

CONCLUSION

Anemia was found to be a public health problem in the study area. Present study revealed dietary insufficiency of iron to be a major health problem in adolescent girls, which has an inverse effect on the later stages of life. High prevalence of anaemia among adolescent girls indicates the need for additional nutritional support of iron and folic acid supplementation and prevention and control of worm infestation in urban communities mostly. Thus, school-based Iron folic acid supplementation and regular nutritional screening and deworming program should be implemented to help adolescent girls who are at risk of anemia. The adverse effect of dietary insufficiency of iron was evident in the anthropometric data when compared to NCHS standards. Among the ill effects of anaemia, paleness and weakness were common and found to be more prevalent in vegetarian diet. Majority of girls skipped breakfast and consumed high quantity of tea and coffee. Girls with paleness had significant dietary insufficiency of iron. It would be desirable that action for improvement is initiated right at the adolescent stage, thereby ensuring adequate body stores of iron even before they marry and become pregnant. Household monthly income, family size, intestinal parasite infections and BMI for age were the main predictors of anemia. The knowledge regarding anaemia and iron-rich food is low. Thus, specific Information Education and Communication to improve their knowledge on anaemia in community can also contribute toward reducing the prevalence of anaemia. To improve the prevailing nutritional problem, there must be inter-sectorial collaboration among health sectors and education sectors in providing nutritional education and counseling based on age and other status.

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