Volume : 5 | Issue : 12 | December-2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 78.46

Original Research Paper

Diet Assessment and Anaemia status among Adolescent School Going Girls in Urban Chennai

Gynaecology

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

Dr.D.Geetha M.D.,D.G.O	Senior Assistant Professor.Department of obstetrics & gynaecology,Institute of Social Obstetrics and Govt.Kasturba Gandhi Hospital for Women and Children,Triplicane,Chennai-600005. Mobile No:+919486234235
Dr.S.Anitha M.D	Senior Assistant Professor.Department of obstetrics & gynaecology,Institute of Social Obstetrics and Govt.Kasturba Gandhi Hospital for Women and Children,Triplicane,Chennai-600005. Mobile No:+919444047342
Dr.D.Lakshmi M.B.B.S	PG Student in Community Medicine,Rajah Muthiah Medical college,Annamalai Nagar,Chidambaram-608002,Mobile

ABSTRACT

Aim : To assess the diet profile and anaemia status among urban adolescent school going girls.

Methodology: The study was conducted during January 2016-June 2016 (6 months duration) in schools in urban chennai. 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: 450 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 urban chennai. It included a total of 450 adolescent girls, aged 11-17 years. Out of the 450 girls, 313 (69.55%) were in the age group of 11-14 years, whereas only 137(30.44%) were in the age group of 15-17 years. Thus, a majority of the girls were in the age group of 11-14 years. The mean height was 150.73 ± 5.39 cms. The mean weight was 38.51± 9.45 kgs and the mean Body Mass Index (BMI) was 16.93± 3.44 kg/sqmt (Table-2). The overall prevalence of dietary insufficiency of iron was found to be present in 70.88% (319 out of 450) girls.(Table-1). Majority of them were in the age group 11-14 years. As per WHO criteria for Asian, 32.66% (147 out of 450) girls were underweight (BMI < 18.5 kg/mtsq). Adolescent girls who were categorized as overweight as per the criteria (BMI- 23 to 24.9 kg/mtsq) were 6.2% (28 out of 450). 87.5% of girls had mixed diet whereas only 12.5% of girls had vegetarian diet.(Table3). Diet profile showed high consumption of tea and coffee(78.4%),18.5% girls skipped breakfast. The symptoms were more common in girls with vegetarian diet (Paleness- 28.14%,weakness-44.3%) as compared in girls with mixed diet (Paleness-16.56% and weakness-33.8%).Significant association was found between dietary insufficiency of iron and presence of paleness.

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]. 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 intra-uterine 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] . 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]. Anaemia is a multi-factorial disorder that requires a multi-pronged approach for its prevention and treatment. 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 450 adolescent girls were present in the study area. All unmarried, non-pregnant, non-lactating adolescent girls(11-17years) were included in the study.A case study was carried out from January 2016 to June 2016. 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.

RESULTS :

The present study was conducted in different schools in urban chennai. It included a total of 450 adolescent girls, aged 11-17 years. Out of the 450 girls, 313 (69.55%) were in the age group of 11-14 years, whereas only 137(30.44%) were in the age group of 15-17 years. Thus, a majority of the girls were in the age group of 11-14 years. The mean height was 150.73 ± 5.39 cms. The mean weight was 38.51± 9.45 kgs and the mean Body Mass Index (BMI) was 16.93± 3.44 kg/sqmt (Table-2). The overall prevalence of dietary insufficiency of iron was found to be present in 70.88% (319 out of 450) girls.(Table-1). Majority of them were in the age group 11-14 years. As per WHO criteria for Asian, 32.66% (147 out of 450) girls were underweight (BMI < 18.5 kg/mtsq). Adolescent girls who were categorized as overweight as per the criteria (BMI- 23 to 24.9 kg/mtsq) were 6.2% (28 out of 450). 87.5% of girls had mixed diet whereas only 12.5% of girls had vegetarian diet.(Table3). Diet profile showed high consumption of tea and coffee(78.4%),18.5% girls skipped breakfast. The symptoms were more common in girls with vegetarian diet (Paleness-28.14%,weakness-44.3%) as compared in girls with mixed diet

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(Paleness-16.56% and weakness-33.8%).Significant association was found between dietary insufficiency of iron and presence of paleness.

TABLE-I
Distribution of study participants in relation to dietary insufficiency of iron
Study Participants (n=450)

Dietary sufficiency of Iron	Number	Percentage
insufficient	319	70.88
sufficient	131	29.11

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

Anthropometric Measurements	**NCHS**	
Parameter	Mean ± S.D	
Height (in cms)	150.73 ± 5.39	163
Weight (in Kg)	38.51 ± 9.45	53.8
BMI (Kg/sqmt)	16.93 ± 3.44	

TABLE -III Dietary prevalence
Study Participants (n=450)

Dietary Prevalence	Number	Percentage
Vegetarian	56	12.5
Mixed	394	87.5

TABLE- IV
Distribution of study participants according to presence of paleness

Paleness	Dietary Iron Status	Total	
	Insufficient	sufficient	
Absent	70	163	233
Present	168	49	217
Total	238	212	450

DISCUSSION:
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. 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 and iron absorption inhibitors in food: phytates/tannins[6]

i) 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 multi-country 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] . A one year cross-sectional study by Biradar et al(2012) in Belgaum, Karnataka found 41.1% adolescent girls to be anaemic[8]. A study by Kaur et al (2011) in adolescent girls and boys in Patiala revealed 98% of girls and 56% of boys to be anemic[9]. Similar study by Kaur et al(2015) in adolescent medical students in Amritsar, Punjab showed 45.7% of girl students as anaemic[10].Goyle et al (2009) found anaemia in 98% of adolescent girls attending government schools in Jaipur, Rajasthan[10] .

ii) Ill effects of anaemia
Among the clinical effects of anaemia, Paleness and weakness were found in 48.22% and 79.55% girls respectively. Similar results were found by a study by Kaur et al (2011) with 68% paleness and 64% easy weakness [9] .

iii) Anthropometric Measurements
The anthropometric measurement revealed that the average height of the girls ranged from 146-159 cms with the mean value being 150.73 ± 5.39 cm. The height was almost comparable to NCHS standard (Table 2)). Average weight of the girls ranged between 32-51 kgs with the mean value being 38.51 ± 9.45 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 by Kaur et al (2011) 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 by Kaur et al(2015) in Amritsar, Punjab found 18% of girls to be underweight[9]

iv)Dietary assessment
87.5% girls had mixed diet whereas 12.5% followed vegetarian diet. The general meal pattern showed that majority of girls consumed 3 major meals per day, breakfast, lunch and dinner. Only 18.5% girls were consuming 2 meals per day by skipping breakfast. Consumption of tea and coffee were found in majority of the girls, 78.4% 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 by Kaur et al (2011) showed 14% female subjects consuming mixed diet, 16% of girls skipped breakfast, 34% of girls consumed more tea and coffee11.Bhoite et al (2011), Kaur et al (2015) also revealed higher tea and coffee consumption as well as inadequate intake of these food groups [10] .

CONCLUSION:
In conclusion, the 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.The adverse effect of dietary insuffiency 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. 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

ACKNOWLEDGMENT
We would like to thank Dr. Inbapriyanka and Dr. Lakshmi, the two postgraduate students who were actively involved in data collection for this study. We would extend thanks to all the study participants and their parents for allowing their children to participate in this

study.

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