



**EFFECT OF CUP CAKES MADE WITH MORINGA LEAVES AND VITAMIN-C DRINK
AS SUPPLEMENT ON HAEMOGLOBIN LEVELS OF COLLEGE GIRLS**

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ABSTRACT

Anaemia Anemia is one of the most important health problems throughout the world among adolescent. Anemia results from nutritional deficiency of iron, folate, vitamin B12 and some other nutrients. Effects caused by malnutrition can be particularly associated with the micro nutrients insufficiency are zinc and iron deficiency. Iron deficiency anemia is one of the most wide spread preventable nutritional problems in the world. Anaemia is a decrease in the total amount of RBC's or haemoglobin in the blood. Anemia comes on slowly, the symptoms are often vague and may include feeling tired weakness shortness of breath and poor ability to exercise when anemia comes on quickly symptoms may include confusion, feeling like one is going to pass out ,loss of consciousness and increase thirst. Iron and folic acid supplements are recommended to combat moderate and severe anemia. Intake of low cost iron rich foods such as drumstick leaves increase heamoglobin levels.This study focus on the impact of moringa leaves supplementation to over come anaemia.

KEYWORDS: Anaemia, nutritional and non nutritional, supplements.

INTRODUCTION

Anaemia is one of the most common causes for malnutrition and it has a great health significance affecting children, adolescents and women of reproductive age worldwide. Iron deficiency anaemia (IDA) is highly prevalent among adolescent age group of Indian girls mainly from lower social economic status nearly 80% of women with anaemia suffer from Iron Deficiency Anaemia (IDA). Nutritional anaemia refers to the low concentration of haemoglobin due to poor diet. Haemoglobin is used to transport and deliver oxygen in the body. Without oxygen, the human body can not undergo respiration and create ATP, thereby depriving cells of energy

Nutritional anaemia is caused by lack of iron, protein, B12 Folic acid, other vitamins and minerals that are needed for the formation of haemoglobin. Folic acid deficiency is a common association of nutritional anaemia and iron deficiency anaemia is the most common nutritional disorder. Internationally, anaemia is caused by iron deficiencies is the most common nutritional disorder. Health consequences of anaemia include low pregnancy outcome, impaired cognitive and physical development, increased rates of morbidity and reduced rates of work in adults.

Nutritional anaemia has different causes, either nutrition/non nutritional. Nutritional causes are vitamin and mineral deficiencies.

Nonnutritional causes are by infection

Signs of anaemia include cyanosis jaundice and easy bruising. Symptoms of severe or rapid onset anaemia are very dangerous as the body is unable to adjust to the lack of haemoglobin. This may result in shock and death.

Diet improvement is a way to combat nutritional anaemia and this can be done by taking directly supplements such as iron, folate and vitamin B12. An insufficient intake of iron, vitamin B12, folic acid impairs bone marrow function. This is common in immune compromised, elderly and diabetic people. High blood loss can also come from increased loss of blood menstruation, child birth, cancers of intestines, a disorder that hinders blood's ability to coagulate.

Adolescents are future generation of any country and their nutritional needs are critical for the well being of the Society. The present study was undertaken to find out the Magnitude of anemia in adolescent girls studying in college, catering to rural areas of District West Godavari, AP, India and to study the socio-economic & nutritional factors related to anemia.

Women in the child bearing years are particularly susceptible to iron deficiency anemia because of blood loss from menstruation and the increased blood supply demands during pregnancy

Iron deficiency anemia is most common type and Certain forms of anemia are hereditary and infants may be affected from the time of birth. It is important to strengthen health education on the consumption of iron rich foods & proper implementations of intervention programmes that would increase the hemoglobin levels among the adolescent age groups dietary modification & helminthes control.

METHODOLOGY

According to WHO, a haemoglobin concentration below 7.5 mmol /L and 8 mmo l/L for women and men is considered to be anaemia. The present study was undertaken to find out the Magnitude of anemia in adolescent girls from rural areas of District West

Godavari, AP., India and to study the socio-economic & nutritional factors related to anemia.

This study was done with the intention of finding an efficient substitute in the form of non haem iron of vegetable origin i.e., drumstick leaves by administering as supplementation to treat anaemia. Anaemia was diagnosed with blood test. In the present study 40 adolescent girls were identified with low haemoglobin level. Their socio economic status was taken into consideration. Selected subjects were given de warming tablets before starting supplementation.

RESULTS AND DISCUSSION

Malnutrition especially iron deficiency anaemia and vitamin A deficiency .The important cause of anaemia is believed to be iron deficiency due to inadequate. Vitamin c is a well known enhancer of iron bioavailability. Several researchers have reported relationship between iron and vitamin A (Avinash Nambiar et al).

The Nutrient Composition of leaves, leaf powder

Nutrients	Fresh leaves	Dry leaves	Leaf powder
Calories (cal)	92	329	205
Protein (g)	6.7	29.4	27.1
Fat (g)	1.7	5.2	2.3
Carbohydrate (g)	12.5	41.2	38.2
Fiber	0.9	12.5	19.2
VitaminB1 (mg)	0.06	2.02	2.64
VitaminB2 (mg)	0.05	21.3	20.5
VitaminB3 (mg)	0.8	7.6	8.2
Vitamin C (mg)	220	15.8	17.3
Vitamin E (mg)	448	10.8	113
Calcium (mg)	440	2185	2003
Magnesium (mg)	42	448	368
Phosphorus (mg)	70	252	204
Potassium (mg)	259	1236	1324
Copper (mg)	0.07	0.49	0.57
Iron (mg)	0.85	25.6	28.2
Sulphur (mg)	-----	-----	870

All values are in 100 g per plant material: (lakshmi priya et al)

A recipe was prepared with moringa leaves powder namely- **cupcake**, which consists of 5 grams of moringa each. These cupcakes were given to the subjects as iron supplements. Along with these cup cakes, vitamin c supplement like lime juice or amla murabba were given on alternate days for period of 15 days. After 15 days the blood samples of the subjects were analyzed for

haemoglobin levels and data was analyzed and presented.

Drum stick leaves with its high beta carotene content along with vitamin c from lemon juice may have a positive impact in the mobilization of stored iron and increase hemoglobin levels of anaemic subjects.(Avinash et al.,).

Table I: Age wise distribution of girls.

S. No.	AGE	NO OF GIRLS	PERCENTAGE
1	below 19 years	2	7 %
2	19 & Above 19 years	28	93 %

The above table indicated that the girls taken under study belong to 19 and above as 93% and 7% as below 19 years of age.

Table II: Distribution of Father's occupation.

S. NO	Father's occupation	No of Girls	Percentage
1	Farmers	10	33.3%
2	Business	8	26.6%
3	Others	12	40%

The fathers of subject's occupation was considered to be 33.3% are farmers, 26.6% are in business where as 40% of them are either employed or daily wage workers.

Table III: Distribution according to Mother's occupation.

S. NO.	Mother's occupation	No. of Girls	Percentage
1	Employees	3	10 %
2	House wives	27	90 %

Mothers of the subjects were found to be unemployed (90%), where as 10% of them are employed.

Table VI Area wise distribution of girls.

S. NO.	Area	No of Girls	Percentage
1	Urban	2	6.6%
2	Rural	28	93.3%

Subjects under study are first generation learners and they belong to rural areas of coastal district.

Table V: Distribution according to Income levels.

S. No.	Income	No. of Girls	Percentage
1	Below 50,000/-	2	13.3%
2	Above 50,000/-	28	93.3 %

These girls are from the families of very low income like 13.3% are having below 50,000 thousand of annual income, where as 93.3% of them have above 50000 income and less than 1lakh.

Table VI: Distribution according to Hemoglobin levels.

S. No.	Hb levels	No. of Girls	Percentage
1	Below 7	12	40 %
2	7 & Above 7	18	60 %

The haemoglobin levels were below 7 for 40% of girls whereas for 60% of them have above 7 values.

CONCLUSION

According Rama Tupe, Nandita, (2009) the mean bioavailable iron intake was 0.76 ± 0.3 mg/day, which is one half of basal iron requirement of adolescent girls. Multiple regressions including socio-demographic factors revealed that the family size, number of menstrual days lost and total bioavailable iron intake were the influencing factors for low iron status. In conclusion, there is a need to increase intakes of vit-c and other

micronutrients of the MAGs and to improve iron bioavailability through diet modifications.

Since these leaves are nutritional powerhouses and are especially helpful for boosting iron intake. Moringa is perhaps the best plant based, iron rich food. A 100g serving of moringa provides more iron than the same serving of kale, spinach or Swiss chard. Iron is very difficult for the body to absorb, so it is necessary to eat foods that also include vitamins that will help your body retain iron. Moringa supplies a host of vitamins and minerals that aid in iron retention: vit-C, folic acid, and vit-B12. To prevent anemia or to increase your iron levels, addition of moringa to your diet is essential. The moringa leaves are known to be an excellent source of iron. It has approximately 90 nutrients and 46 antioxidants.

Since Iron deficiency anemia is most prevalent among young girls from lower socioeconomic strata, this study was done with the intention of finding efficient substitutes in the form of nonhaem iron of vegetable origin i.e. moringa oleifera leaves and vitamin c supplements in the form of lemon juice and Amla Marmalade to treat anemia.

From this study it can be concluded that there was an improvement of ± 0.5 improvement in haemoglobin after the supplementation of Moringa cupcakes for a period of 15 days. Drumstick leaves with beta carotene content of 19690 mcg/100gm has a good bioavailability may also useful in improving utilization of iron (Avinash Nambiar). Thus in spite of their socio economic conditions and the rural background moringa leaves found to be the best source of iron that improves Hemoglobin levels in young girls.

Suggestions

As Drumstick leaves equal to 7 times vitamin c in oranges, 4 times vitamin a in carrots, 4 times calcium in milk, 3 times potassium in banana, 2 times protein in yoghurt, 4 times fiber in oats, 9 times iron of spinach. Eating drumstick leaves curry or taking juice regularly can certainly cure anemia.

Education about avoiding the meal skipping, junk foods and fast foods will prevent the iron deficiency. Anemia and encourage the intake of low cost iron rich drumstick leaves, dates, jaggery, ragi, green leaves, chickoo, and vitamin c foods too.

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