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GREEN CHUTNEY WITH IRON SUPPLEMENTS MAY BE A TOOL FOR FIGHTING ANEMIA IN ADOLESCENT GIRLS

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Abstract

Background: Globally, anemia is the most common nutritional problem affecting major part of the world's adolescent population affecting human resource development and economic prosperity of the country. Hence a number of schemes are being run by Government bodies to supplement the food with iron supplements to combat anemia. However these schemes are not successful due to noncompliance of iron supplements by consumers. Today most of adolescent aged girls are interested in taking anything extra in name of "greens" and hence is the window of opportunity to correct their nutritional status by providing additional food supplements and prevent future consequences of nutritional deficiencies. This study aimed to evaluate the compliance of subjects to iron supplements with addition of green traditional food "green chutney" with iron supplements and effectiveness of iron supplements alone in treating iron deficiency anemia.

Methods: This was a quasi-experimental study (two group pretest and posttest design) conducted among 70 female subjects (35 subjects each in study group I and study group II). Subjects in study group was given green chutney twice a day and iron supplements once daily, while subjects in study group II, were given only iron supplementation once daily for consecutive 42 days. Hemoglobin (Hb) was assessed before and at the end of study.

Results: It was observed that there was a significant rise in the mean hemoglobin (Hb) level to 11.58±1.127 ($P < 0.01$) in study group I and study group II 11.66±1.000($P < 0.01$) compared to baseline values.

Conclusion: The outcome of this study suggests a better compliance and acceptance of kitchen based iron supplement and combination of green chutney and iron supplementation proved to be more effective to overcome iron deficiency.

Key words: Anemia, adolescent girls, Iron supplements, Green Chutney, Hemoglobin

Introduction

Iron deficiency is one of the major causes of anemia in developing nations (1). Iron deficiency anemia is generally caused by inadequate intake of iron, chronic blood loss, or may be combination of both. It is most common in adolescent girls due to heavy blood loss during menstrual cycle every month (2, 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 also, additionally 89% of this burden occurs in developing countries. At a national level, it affects human resource development and economic prosperity of the country (4). Hence a number of schemes are being run by Government bodies to supplement the food with iron supplements to combat anemia. However these schemes are not successful due to ignorance of consumers or lackadaisical approach of government bodies in organizing the supplementation program at grass root level (5, 6, 7). There is a need of developing and popularizing kitchen based supplement which will not give an impression of a medicine to the consumers and improve compliance/acceptance of the therapy. Hence a study was conducted on 70 adolescent girls to evaluate the effect of kitchen based preparation 'Green Chutney' rich in iron on their Hb level.

Material and Methods

Quantitative research approach with two group pretest and posttest design was used to assess the effect of Green Chutney and Iron supplements on Hb level in the subjects. The study was approved by the Institutional Research and Ethics Committee of University College of Nursing, a constituent college of Baba Farid University of Health Sciences, Faridkot, Punjab (No. UCN/2021/1115). Confidentiality was maintained throughout the study.

Inclusion Criteria:

Female subjects in the age group of 18–25 years having mild to moderate anemia with a Hb of 10.0 or <12.0 g/dl

and having a peripheral smear picture of hypochromic, microcytic anemia were included in the study.

Exclusion Criteria:

Subjects with medical history of current hematological disorders other than IDA (e.g. aplastic anemia, megaloblastic anemia, sideroblastic anemia, pernicious anemia, thalassemia, and sickle cell anemia), thyroid dysfunction, chronic renal disease, menstrual irregularities, malabsorption syndrome, hypersensitivity to iron, or any of the components of the iron tablet and with history of prior intake of iron supplements 3 months before participating in the study were excluded from the study.

All the subjects who fulfilled the inclusion and exclusion criteria were recruited for this study after getting a written informed consent from them. Random sampling method was used to include 35 subjects for each study group. Study group I was given green chutney and tablet Ferisome 30mg as iron supplements, while the study group II was given only tablet Ferisome 30 mg. Utmost care was taken to assure homogeneity of the both groups by calculating statistical significance of subjective data as per Table.1.

Table 1: Chi square values of sample characteristics of subjects in study group I and study group II(N=70)

Variables Under Study	Chi Squre (χ 2)
Age (in years)	χ 2=.245, df=1 p=.62 ^{NS}
Family Monthly Income	χ 2= 6.888, df=4 p=.142 ^{NS}
Dietary Pattern	χ 2= .590, df=2 p=.744 ^{NS}
Age at Menarche	χ 2=3.660, df=1 p=.056 ^{NS}
Duration of Menstruation	χ 2=.058, df=1 p=.810 ^{NS}

NS= Non-significant at p<0.05

Procedure of Data Collection:

Data collection was done after screening the subjects on the basis of clinical signs and symptoms of anemia (generalized weakness, difficulty in concentration, fatigue and exercise intolerance, pallor palms, skin and conjunctiva). On the basis of clinical sign-symptoms, these subjects were referred to physician for the prescription of lab-investigation (CBC, Hb and PBF). As per the results of the lab investigations, the subjects having normal hematological parameters, but having Hb level between 8.0-11.9 mg/dl were prescribed Tablet Ferisome (30mg OD). Analysis of the data was computed by SPSS 20. The p value at <0.05 was considered as statistically significant.

Description of Intervention:

Planned Intervention for the study group I contain green chutney which was prepared by the researcher by using following contents:

Table 2: List of Ingredients of Green Chutney

Ingredients	Amount(g)	Reported Therapeutic effect	Content
Coriander leaves	200	Provides iron	Iron, Vit. K
Mint leaves	100	Provides iron	Iron, calcium
Onion	100	Increase absorption of Iron	Iron, Vit B_6 and C, folate
Jaggery	70	Provide iron and increases iron absorption	Iron, Phosphorus
Anardaana	12	Increase absorption of Iron	Vit. C, K and B_6
Peanuts	10	Provides iron	Phosphorus,Thiamine,Folate
Salt and Green chili	as per taste	Increase absorption of Iron	Vit. C, Sodium

These all ingredients were blended in grinder into a smooth paste. Two full tablespoons (28g) of freshly prepared green chutney (one tablespoon in morning and one in evening) were given for 42 consecutive days to the subjects in study group I. Subjects were also prescribed tablet Ferisome 30mg. Total per day dose of 28g green chutney (Two tablespoon) contains 118.4 calories, 8.0g of carbohydrate, iron 5.88mg, protein 3.3g, folate 9.8 microgram, calcium 86.4 mg and other vitamins like C, K, A, B_6, thiamine, niacin and minerals like zinc, phosphorous.

Study group II was given only iron supplements i.e. tablet Ferisome 30 mg.

Results

Table 3: Pre and post intervention Hb levels of subjects of study group I and Study Group II.

Variables	Mean±SD	Mean Difference	t-value	df	p-value
Study Group I (n=35)					
Pre-intervention	10.19±1.079	1.3857±.6325	12.961	34	.01*
Post-intervention	11.58±1.127				
Study Group II (n=35)					
Pre-intervention	10.68±1.004	0.9800	23.351	34	.01*
Post-intervention	11.66±1.000				

*=significant at p<0.01

Table 3 shows effectiveness of planned interventions on Hb levels of subjects in study group I and study group II. Pre-intervention mean level of Hb in study group I was 10.19 whereas post-intervention mean level of Hb was 11.58 with mean difference 1.3857. The difference was found to be significant at p<0.01 level. This depicts that intervention was effective in improving Hb level of subjects. Pre-intervention mean level of Hb in study group II was 10.68 whereas post-intervention mean Hb level was 11.66 with mean difference 0.9800. The difference was found to be significant at p<0.01 level. Iron supplements were effective in improving Hb level of subjects. The main fact generated from the results was difference in mean Hb levels in study group I and study group II, which was more in Study group I than study group II. Thus, kitchen based remedy; "Green Chutney" enhanced the absorption of iron, thus more effective in improving the Hb level of subjects.

Discussion

Iron is a very essential mineral for our body and iron deficiency anemia can be principally improved by iron supplementation (8, 10). In the present study efforts have been made to supplement iron through inorganic source i.e. Feriosome tablets as well as organic source i.e. Green Chutney. In fact most parts of the organic supplement provided by investigators have been reported to be rich source of iron. Coriander leaf contains 2.1 milligrams of iron per 5.0 grams. Fresh juice of coriander is extremely advantageous in curing many deficiencies related to vitamins and iron (9). Mint leaves contain high levels of two essential minerals (Fe and Mg), comparing favorably with other common leafy vegetables. Mint leaves show great promise as a dietary source of these human essential minerals, especially for populations where malnutrition and micronutrient deficiencies are prevalent (10). Both garlic and onion have been reported to promote the bio-accessibility of iron and zinc from food grains. Therefore, eating onions in conjunction with Jaggery and water can provide a significant amount of vitamins and minerals like iron which helps to provide nourishment to our body, which is very essential for treating anemia (8). Jaggery has also been reported as a very rich in important minerals, vitamins, and proteins (10, 11). This novel information has the potential application in evolving a food-based strategy to improve the bioavailability of trace minerals and hence contributes to the human health benefit. The outcome of this study proved the effective role of the nutritional supplementation in improving the Hb levels in adolescent subjects. Cumulative effect of kitchen based supplements in the form of Green chutney and iron supplements proved to be a better natural, easily available, cost effective food supplement to overcome iron deficiency anemia. The major advantage of this preparation is absence of adverse effects of kitchen based food supplement as observed with inorganic parenteral iron preparations. It can also be used as a prophylactic strategy to combat iron deficiency in vulnerable population.

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