Research Paper

Formulation and Supplementation of Iron Rich Health Mix and its Effect on Haemoglobin Levels of Adolescent Girls

Home Science

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ABSTRACT   *Anaemia continues to be a major health problem, particularly among late adolescent girls and affects overall nutritional status of adolescent girls.Hence a study was framed to assess the formulation and supplementation of Iron rich health mix among adolescent girls. The samples include 50 anaemic adolescent vegetarian girls and Non-vegetarian girl (aged 17 to 21years). Iron rich healthmix was prepared with selected Iron rich foods and standardized. They were screened with random sampling and 20 girls were in the control group and 20 girls were supplemented with 20g of iron rich health mix daily for 60 days as experimental group. There was a significant increase in the haemoglobin level of the subjects belonging to the Vegetarian Experimental Group throughout the test periods. The 't' values were 1.9391 [0th vs 30th day],4.5381 [oth vs 60th day]and 2.425[30th vs 60th day] which is significant at 1% and 5% level .*

1.INTRODUCTION

Anaemia is a public health problem and the primary cause of it is dietary deficiency . In the study a total of 25 blood-samples of teen-aged girls (14-18 years) were collected from the hospital ofhealth science department, Pune for the detection of iron deficiency anaemia. Results indicated that improved diet and iron supplement alongwith vitamin A and C should be implemented to control iron deficiencyanaemia in rural areas.[1]. A study was carried out to assess the nutritional status of adolescentgirls in selected villages of the kolar district. Prevalence of anaemia was 34.8% and it was more among mensturating girl. The study concludes that there is a high prevalence of under nutrition among adolescent girls in the rural area of the selectedvillages.[2]. Iron deficiency anemia is the most common nutritional disorder seen allover the world, more in the developing countries, particularly, affectingyoung children of 6-24 months of age, adolescents, women of reproductiveage group, pregnant and lactating women. Supplementation of medicinal iron is a key to success which can be achieved by daily or intermittent (weekly) administration of oral iron to the target group[3].

The Objectives of the study are

i.   To select the anaemic adolescent girls.
ii. To determine the haemoglobin level of the selected subjects.
iii. To formulate and supplement Iron rich health mix for the selected subjects.
iv. To evaluate the impact of iron rich health mix among adolescent girls.
v.   To determine the haemoglobin level of the experimental group and interpret the results.

2.METHODOLOGY

Iron deficiency Anaemia is thought to affect the health of more than onebillion people worldwide,particularly women of reproductive age.[4]. Irregular meals, snacking, eating away from home, and the alternativedietary patterns characterize the food habits of adolescents. These habits are further influenced by family, peers and the media[5]. Astudy was designed to assess the effectiveness of 20gm of iron richhealth mix on haemoglobin levels of 50 anaemic late adolescent vegetarian girls aged (17-21 years) with random sampling [20 experimental and 20 control group]and supplemented for a period of 60 days in chennai district.

2.1 Description of the supplement:

The supplement provided to the subject was in the form of pow-deredhealth mix and the samples are asked to consume 20g/day.

2.1.1 Sensory evaluation of the supplement:

Health mix was evaluated for its sensory attributes like taste, colour, texture, flavor, taste and overall acceptability. Score card was used for the evaluation. It was evaluated with different combinations of proportion of ingredients with three trials by using a 5 point hedonic scale by a panel of judges consisting of 20 adolescent female participants . Each trial mix was alloted a maximum score of 5 for excellent,4 for very good, 3 for good,2 for fair and 1 for poor.

2.1.2 Iron rich health mix Ingredients: (for 600 g)

Cashew nut - 50g
Pistachio nut - 25g
Piyal seeds - 25g
Cardamom - 10g
Nutmeg powder - 10g
Black raisins - 40g
Dry dates - 40g
Dry figs - 20g
Milk powder - 85g
Sugar - 50g
Rice flakes - 145g
Almond - 50g

2.1.3 Method of preparation:

Sundry piyal seeds and all nuts for one day.Heat a pan and roast rice flakes and the above ingredients for 3-5 minutes and allow it to cool.Grind rice flakes, piyal seeds and all nuts in the mixer separately.Grind sugar with cardamom separately then chop all the dry fruits and keep aside. Now mix milk powder, owdered sugar, all grinded ingredients,nutmeg

powder and chopped dry fruits together and mix well.Now the iron rich health mix is ready to consume.

3 RESULTS AND DISCUSSION

The study revealed that the mean heamoglobin level of the experimental vegetarian and Non-vegetarian group was higher after the supplementation of the Iron rich health mix than the control vegetarian and Non-vegetarian group.

Table 2 Comparison of mean haemoglobin level of the experimental and control group between different test periods among vegetarians

Test periods compared	Experimental Group N=20		Control Group N=20	
	Mean ± SD	't' value	Mean ± SD	't' value
0 Vs 30	8.88 ± 0.4716	1.9391*	8.74 ± 0.6004	-0.0572NS
	9.58 ± 0.6996		8.72 ± 0.5056	
0 Vs 60	8.88 ± 0.4716	4.5381**	8.74 ± 0.6004	-0.1045NS
	10.55 ± 0.7465		8.7 ± 0.73	
30 Vs 60	9.58 ± 0.6996	2.425**	8.72 ± 0.5056	-0.0541NS
	10.55 ± 0.7465		8.7 ± 0.73	

NS - not significant [* - significant at 1% level][** - significant at 5% level]

From the table 2 , it was observed from the 't' test that there was a significant increase in the haemoglobin level of the subjects belonging to the Vegetarian Experimental Group throughout the test periods. In the pair 1 (0th vs 60th day), pair 2 (0th vs 60th day) and pair 3 (30th vs 60th day), the 't' values were 1.9391,4.5381 and 2.425 which is significant at 1% and 5% level due to the supplementation of iron rich health mix. When observed the values of Vegetarian Experimental Group there was no significant increase in the haemoglobin level of the subjects during the test periods of the pair 1 (0th vs 30th day), pair 2 (0th vs 60th day) and pair 3 (30th vs 60th day) which is not significant at 1% and 5% level.

Table 3 comparison of mean haemoglobin level (mg) of the experimental and control group between different test periods among non-vegetarians

Test periods compared	Experimental Group N=20		Control Group N=20	
	Mean ± SD	't' value	Mean ± SD	't' value
0 Vs 30	9.24 ± 0.1484	3.9024*	8.77 ± 0.5801	0.0276NS
	10.04 ± 0.2304		8.78 ± 0.5956	
0 Vs 60	9.24 ± 0.1484	6.3675**	8.77 ± 0.5801	-0.1823NS
	10.73 ± 0.3441		8.7 ± 0.746	
30 Vs 60	10.04 ± 0.2304	2.7273**	8.78 ± 0.5956	-0.2073NS
	10.73 ± 0.3441		8.7 ± 0.746	

NS - not significant * - significant at 1% level ** - significant at 5% level From the table 3, it was observed from the 't' test that there was a significant increase in the haemoglobin level of the subjects belonging to the Non-vegetarian Experimental Group throughout the test periods. In the pair 1 (0th vs 60th day), pair 2 (0th vs 60th day) and pair 3 (30th vs 60th day), the 't' values were 3.9024,6.3675 and 2.7273 which is significant at 1% and 5% level due to the supplementation of iron rich health mix.

When observed the values Non-vegetarian Experimental Group there was no significant increase in the haemoglobin level of the subjects during the test periods of the pair 1 (0th vs 30th day), pair 2 (0th vs 60th day) and pair 3 (30th vs 60th day) which is not significant at 1% and 5% level.

Table 4 comparison of mean haemoglobin level (mg) of the experimental and control group before and after the supplementation

Period of study	Experimental Group	Control Group	't' value
	Mean ± SD	Mean ± SD	
0th day	9.06 ± 0.3424	8.755 ± 0.5904	0.9472NS
30th day	9.81 ± 0.5179	8.75 ± 0.5515	3.0725**
60th day	10.64 ± 0.5534	8.7 ± 0.738	5.1323**

NS - not significant ** - significant at 5% level

From the table 4, it was observed that there was a significant increase in the mean haemoglobin level of the Experimental Group, from 0th day to the end of the study (60th day). The mean was 9.06 ± 0.3424 in the 0th day which gradually increased to 9.81 ± 0.5179 in the 30th day and reached to 10.64 ± 0.5534 in the end of the study (60th day).

In the Control Group, the mean haemoglobin level was found to be 8.755 ± 0.5904 in the 0th day, 8.75 ± 0.5515 in the 30th day and 8.7 ± 0.738 in the 60th day. When the initial value was compared with 30th and 60th day's value, the results indicated that the haemoglobin level of the subjects of Control Group were decreased slightly.

A study was carried out to examine the influence of vegetarian diet on the risk of developing anaemia among Indian women . Their analysis revealed that economic characteristics such as being from higherwealth quintiles, being in paid employment, and rural residence reduced theodds of having iron-deficiency anaemia among India women. Consumption of cheap-iron food stuffs should be promoted. [7].

4.SUMMARY AND CONCLUSION
Iron deficiency anaemia is commonly caused by a lack of iron-rich foods or poor diet such as vegetarian life-style.[8].

A study was designed to determine the prevalence of iron deficiencyanaemia among apparently healthy young female at king AbdulazizUniversity students between the age af 18 and 23 years. The studyconcludes that 50.2% of students were normal and hence considered as control group.25.9% of students had deficient iron store and 23.9% of students had iron deficiency anaemia [10].

Snacking has become an important aspect of activity among adolescence. The main meals (breakfast, lunch and dinner) are missed and total proportions of calories are consumed from the snacks eaten[11].

Hence a study was framed to introduce health mix to be included during snack time or in a breakfast along with milk to supplement to adolescent girls.The research design of the study was experimental in nature and carried out in Chennai. The study consists of 50 late adolescent girls aged (17-21 years) from these 20 were considered as control group and 20 as experimental group with Random sampling. 20 g of formulated iron rich health mix was supplemented daily for a period of 60 days. and the result was statistically analyzed and interpreted. The haemoglobin levels were analyzed before and after the supplementation of the Iron rich health mix among the individuals.The findings shows that there was a marked increase in the significant level of haemoglobin levels of experimental group whereas in the control group the haemoglobin levels of the subjects were slightly decreased.

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