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IMPACT OF FOOD IRON SUPPLEMENT IN IMPROVING THE BLOOD HAEMOGLOBIN LEVEL OF ANAEMIC ADOLESCENT GIRLS IN AKOLA DISTRICT

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ABSTRACT

Nutritional anaemia due to iron deficiency has emerged as a major health problem of immense public importance in our country. During adolescence, Iron deficiency anaemia not only reduces work productivity but also leads to complications of pregnancy in the later years; therefore, an intervention study was conducted to improve the haemoglobin of anaemic adolescent girls in Akola City. 800 adolescent girls were selected belonging to the age group of 16-18 years from 7 talukas of Akola district. It was found that only 31.25 per cent adolescent girls were in normal haemoglobin level and 68.75 per cent adolescent girls were found anaemic, 54.54 per cent subject under mild category. Whereas 43.28 per cent were under moderate category and only 2.18 per cent subjects under severe category of anaemia. A total number of 30 moderate anaemic adolescent girls were selected for intervention study. Poustic laddus were prepared for supplementation with iron rich foods namely rice flakes, soybean flour, wheat flour, Bengal gram flour, gingelly seeds, garden cress seeds, jaggary, grated coconut and ghee. After 90 days of feeding trial haemoglobin level was determined. The data collected from the study were subjected to statistical analysis. It was concluded that iron supplementation to moderate anaemic adolescent girls brought about significant improvement in haemoglobin status and ultimately beneficial and effective to improve their nutritional status.

Keywords: Food iron supplement, haemoglobin, anaemia, adolescent girls.

INTRODUCTION

Nutritional anaemia due to iron deficiency has emerged as a major health problem of immense public importance in our country during this decade. It affects persons of all ages and all socio-economic groups of the society. Nearly, 50 per cent population is affected by iron deficiency anaemia (IDA) hence, it is one of the foremost important nutritional problem yet to be controlled by the nation. IDA accounts for almost 85 per cent of

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all types of anaemias in India.

Iron deficiency gives rise to functional consequences before anaemia becomes clinically apparent. In infants and young children, these consequences, include impaired psychomotor development and coordination; impaired scholastic achievement, reduced physical activity and behavioural effects such as lack of concentration and fatigue. In adults of both sexes, iron deficiency reduces work capacity and lowers resistance.

During adolescence, Iron deficiency anaemia not only reduces work productivity but also leads to complications of pregnancy in the later years, targeting adolescent girls in anaemia prevention programmes would not only have an immediate curative effect but may also have long term preventive effect pregnancy and location. United Nations reemphasized that control of nutritional anaemia should be one of the global development goals to be achieved in the early years of this new millennium.

Adolescent girls form an extremely important segment of any society. The adolescent growth spurt creates a greater risk of iron deficiency anaemia in girls due to periods of excess menstrual loss. Prevalence of anaemia among adolescent girls is a matter of great concern as these girls enter the reproductive life soon after the attainment of menarche so food based approaches have higher potential for achieving far reaching and long lasting benefits for the control of iron and other micronutrient deficiencies. Hence, the research was undertaken to study the Impact of food iron supplement in improving the health status of anaemic adolescent girls in Akola District.

MATERIAL AND METHODS

A total sample of 800 adolescent girls was selected belonging to the age group of 16-18 years from 7 talukas namely Akot, Balapur, Mutizapur, Patur, Telhara, Barshitakali, Akola Gramin and Akola city of Akola district. To judge the extent of prevalence of anaemia among the

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adolescent girls the blood sample by finger prick method was collected from the entire sample. A total number of 30 moderate anaemic adolescent girls were selected for intervention study as experimental group and 30 adolescent girls were selected as control group.

Development and preparation of food Iron supplement

Poustic laddus were prepared for supplementation with iron rich foods namely rice flakes, soybean flour, wheat flour, Bengal gram flour, gingelly seeds, garden cress seeds, jaggary, grated coconut and ghee. Iron content of laddus was determined by wong's method and nutritive value was calculated by nutritive value tables. A total number of 30 moderate anaemic adolescent girls for 90 days were fed two laddus daily (80 g) for intervention study. After the feeding trial haemoglobin level was determined. The data collected in the study were subjected to tabulate, analyse, percentage and mean etc. analysis to draw the conclusions of the study.

RESULTS AND DISCUSSION

The present study was conducted amongst college going adolescent girls (16-18 years) to identify the anaemic subjects and selected for supplementation study. The subjects were evaluated for different aspects such as Prevalence and severity of anaemia, and effect of supplementation.

Prevalence and severity of anaemia

In the present study the haemoglobin level of the blood was assessed by the cyanomethaemoglobin method as it can be easily carried out at the field and most economical one. The normal category referred to the haemoglobin level between 12-16 g/dl, mild anaemia referred to the haemoglobin level between 10 to 11.9 g/dl. Moderate anaemia referred to the haemoglobin level 8 to 9.9 g/dl and severe anaemia referred to the haemoglobin levels less than 8 g/dl.

From the Table 1 it is evident that 31.25 per cent

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adolescent girls were found to be in normal haemoglobin level with mean value of 12.28 ± 0.82 g/dl and 68.75 per cent adolescent girls were found anaemic between the haemoglobin levels of 7 to 11.9 g/dl with the mean value of 9.23. So, it can be clearly seen that more than half of the subjects were anaemic.

It is revealed from the Table 2 that there were 54.54 per cent subject under mild category having mean haemoglobin 10.990 ± 0.82 g/dl. Whereas 43.28 per cent were under moderate category having 9.20 ± 0.64 g/dl haemoglobin level.

It was found that there were only 2.18 per cent subjects under severe category of anaemia having mean haemoglobin level of 7.41 ± 0.43 g/dl. It indicated that majority of population i.e. 97.82 per cent was under the mild and moderate form anaemia, which can be easily overcome by proper nutritional counseling with suggestion to modify their diet with iron food supplement to restore haemoglobin level. However severe form of anaemia was found in this study (2.18%) was in exceptional cases and may be due to some or other pathological conditions.

Food iron supplement (Paustic laddu)

After the standardization and sensory evaluation nutritive value the food iron supplement (paustic laddu) was calculated.

The table 3 indicates that 2 laddu's contained 19.63 g Protein, and 11.36 mg Iron which is nearly half of the daily requirement and 304 Kcal, 7.12g fat and 99.84 mg calcium.

Impact of supplementation on moderate anaemic subjects

Haemoglobin levels at the initial and final stages of supplementation of selected subject were determined of moderate experimental and control subjects.

Table No. 4 revealed that the mean initial haemoglobin level of experimental group was 9.15 ± 0.09 g/dl for the moderate anaemic group of the subjects. At the end of study, it was observed 9.81±0.09 g/dl with the difference

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of 0.66 g/dl. Statistical analysis showed that the difference between the two means of haemoglobin level of experimental group was found significant at one per cent level whereas in control group initial haemoglobin level was 9.19 ± 0.09 g/dl and the final level of haemoglobin was observed 9.20 ± 0.08 g/dl only with the difference of 0.01 g/dl. The mean difference of the mean haemoglobin level of control group was found non-significant statistically. For the mean differences of experimental and control group 't' value was found significant at one per cent level. So, it can be concluded that the effect of supplementation of experimental group of moderate anaemic group of subjects was found statistically significant and non significant for control group.

CONCLUSION

It can be concluded that iron supplementation to anaemic adolescent girls brought about significant improvement in biochemical profile and ultimately beneficial and effective to improve their nutritional status. There could be a remarkable change seen by improving the iron content in diet of adolescent girls and make it possible to bring down the figure of anaemia, this meeting the challenge successfully controlling anaemia in adolescent girls. They must be healthy and free from the slow killer disease like anaemia affecting physical and intellectual capacity of adolescent girls, who would be the future mothers of the nation.

Table 1: Distribution of subjects according to prevalence of anaemia

Category of anaemia	Number n= 800	Per cent	Mean ± SD
Normal	250	31.25	12.28 ± 0.82
Anaemic	550	68.75	9.23 ± 1.38
Total	**800**	**100.00**	**11.19 ± 1.34**

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Table 2: Distribution of subjects according to severity of anaemia. (n=550)

Sr. No.	Degree of severity	Number	Per cent	Mean ± SD
1	Mild	300	54.54	10.90 ± 0.852
2	Moderate	238	43.28	9.20 ± 0.64
3	Severe	12	2.18	7.42 ± 1.24
Total		**550**	**100.00**	**9.14 ± 1.24**

Table 3: Nutritive value of food iron supplement (Laddu)

Weight	Energy (Kcal)	Protein (g)	Fat (g)	Carbo-hydrate (g)	Iron (mg)	Calcium (mg)
100 g	380	24.54	08.90	50	14.20	124.8
Wt. per serving (80g) 2 nos.	304	19.63	7.12	40	11.36	99.84

Table 4: Comparison of mean scores of Haemoglobin (g/dl) of moderate anaemic subjects

Group n=30	Mean Haemoglobin value		Difference	't' Value	
	Initial	Final		I vs F	E2 vs C2
Experimental (E1)	9.15 ± 0.09	9.81 ± 0.09	0.66	8.33**	6.78**
Control (C1)	9.19 ± 0.09	9.20 ± 0.08	0.01	1.45 ns	

NS non significant
* Significant at 5 % level probability.
** Significant of 1 % level probability.

REFERENCES

- Ghate Preeti (2003) Study on food habits and dietary practices of Ethiopian adolescents from V. East Africa. The Home Science Association of India. *Procd* : XXV Biennial Conference, Nagpur Chapter. New Delhi India. Oct. 10-12, 2003. p.31.
- Goyal, Anuradha. (2009): A profile of families of girls studying in a Govt. School in Jaipur city. *J. Soc. Sci.,* 18 (2): 95-101.
- Kanani S. and A. Sen (2003) : Studies on impact of daily and weekly iron folic acid supplements on hemoglobin levels and growth of adolescent girls in Vadodara. *Procd :* IX Asian Congress of Nutrition

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(2003) Nutrition Goals for Asia - Vision 2020. New Delhi Feb 23-27, 2003. p.236.

- Kaplana, C.A., Aruna Narayanan and Thangarathi, T. (2007): Effect of medicinal iron supplementation and nutrition education on anaemic adolescent girls of low income families. *Ind.J. of Nutr. Dietet,* 44(12): 551-558.
- Tanu Shree Singh and Madhu Goyal. (2010): Impact of an Intervention Based on Pearl Millet Ladoo on Hemoglobin Status of Adolescent Girls. Proceeding of 28 Biennial National Conference of Homescience association of India. p. 108-110.
- WHO (2001): WHO (World Health Organisation) website www.who.org/nutz