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Efficacy of Dietary Supplementation in the Form of Multigrain Panjiri in Managing Anaemia among Ethnic Tribal Women of Chhattisgarh

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Abstract

As per the Government of India 2013 database, anaemia in India is a serious public health issue with a high prevalence of about 74 percent with haemoglobin <11 gm/dl. It is prevalent in all age groups, nearly 58 percent in pregnant women, 50 percent among non-pregnant non-lactating women, 56 percent among adolescent girls. The situation is no different in Chhattisgarh. With a tag of tribal dominated state situation needs to be addressed carefully because of socio-economic status of tribal women is comparatively low. The present study assessed the efficacy of dietary supplementation in the form of multigrain panjiri in management of anaemia among ethnic tribal anaemic women of Chhattisgarh. In the study, 100 tribal women from tribal dominated region of Chhattisgarh were selected as sample. The age range of selected subjects was 19 to 25 years. The inclusion criteria for selection of subjects was WHO classification for anaemia. Cyanmet haemoglobin method was used for estimation of haemoglobin. Two groups were created with equal number of subjects in both the groups. The experimental group received dietary supplementation in the form of multigrain panjiri for three months while subjects belonging to control group were not supplemented the additional soya multigrain panjiri. Results reveal that after the study period, more percentage of selected tribal women from experimental group had normal haemoglobin levels as compared to their counterpart i.e. tribal women belonging to control group. It was concluded that soya multigrain panjiri when used as dietary supplement, is beneficial in increasing the haemoglobin levels and thereby useful in management of anaemia in tribal women.

According to Global Nutrition Report 2017, under nutrition in India is of serious concern especially when half of women of reproductive age in India are suffering from anaemia. This Global Nutrition Report 2017 reported that more than 51 percent women of reproductive age in India are suffering from anaemia while 22 percent are obese [Globalnutritionreport.org].

Situation is no different in Chhattisgarh. According to reports of National Vector Borne Disease Control Programme, about 41.0 percent women were underweight while 57.6 percent women of reproductive age were anaemic. To address this issue many strategies have been formulated. One such method is the cost effective supplementation of macro and micronutrients.

Malnutrition among women of reproductive age has detrimental effects on child health; it also reduces their working capacity. Since women are nexus of family and society, efforts are made to control malnourishment in women of reproductive age group. Despite various governments scheme malnourishment in women of reproductive age is still rampant. Hence supplementation in the form of nutritious, rich food may be the answer. One such supplement may be multigrain panjiri, an ages old traditional seasonal staple from Punjab region used as nutritional supplement. Effectiveness of multigrain panjiri in management of iron deficiency anaemia in women of reproductive age group is assessed in the present study.

Review of Literature

Yadav et al (2011) assessed the impact of dehydrated onion stalk on nutritional and haemoglobin status of adolescent girls. The study area was Allahabad. Chakli was prepared by addition of 10 percent of dehydrated onion stalk for feeding experiment; 73 anaemic adolescent girls were selected as sample. Out of these 33 subjects were placed in experimental group and remaining 40 in control group; 24-hour recall method was used for dietary survey. Height and weight of selected subjects was also recorded. 100 gm of Chakli with addition of dehydrated onion stalk was supplemented for one month. Control group acted as placebo. The data was collected

twice as per the requirement of pre-post design. It was found that before the commencement of study period, the intake of all nutrients in both the groups were below the ICMR RDA. The mean value of height and weight were also below the recommended NCHS standards. After intervention period a significant increase was observed in haemoglobin level of adolescent girls belonging to experimental group while no statistically significant change was observed in haemoglobin levels of adolescent girls. The post-test anthropometric data reveal significant weight gain in adolescent girls of experimental group while no significant change in weight in control group was observed. Hence supplementation of dehydrated onion stalk-based product Chakli can be used therapeutically to improve nutritional and haemoglobin levels of adolescent girls.

Sanap, Yogita and Jadhav Kalpana (2014) studied the effect of poha laddoo supplementation on haemoglobin level of anaemic adolescent girls. The selected subjects were from Gond and Madia community of Maharastra; 45 tribal adolescent girls between age range of 13 to 18 years were selected as sample. Haemoglobin estimation was carried out by standard measure. The deworming of subjects was achieved with the help of Albendazol tablet. Apart from supplementation nutrition education in relation to balanced diet was also imparted. Control group continued their daily diet while group I received diet as per RDA recommendation from ICMR. Experimental group II received additional 100 gm poha laddoo supplementation also. The study period was of three months. Results revealed that experimental group II showed significantly better increase in haemoglobin level as compared to experimental group I and control group. Results clearly advocate the efficacy of locally accessible iron-rich food i.e. poha laddoo in management of iron deficiency anaemia. Supplementation of iron rich food prepared locally may be answer to curb iron deficiency anaemia in other parts of India.

Gurwara & Barai (2016) assessed the efficacy of soybean multigrain panjiri on haemoglobin levels of malnourished women of Raipur city; 80 anaemic women from Raipur city was selected with two groups with equal number of subjects in experimental and control group. Haemoglobin estimation of subjects belonging to experimental and control group was carried out Cynamet method prior to the commencement of the study period. Iron rich soya multigrain panjiri was supplemented to each subject of experimental group in a measured quantity every day for three months duration. After three months of study period haemoglobin estimation was conducted again. The result proved that haemoglobin levels of anaemic women in experimental group had enhanced significantly after three months of study period as compared to anaemic women from control group. It was concluded that dietary supplementation of soya multigrain panjiri may be used in managing iron deficiency anaemia.

Ramya & Thomas (2016) conducted a study to explore the impact of iron and folic acid added biscuits on anaemic adolescents. This study was carried out on anaemic adolescent girls of Kottayam; conduct the study 500 adolescent girls were selected. The age range of subjects was 12-19 years. Only those subjects with mild (10-11.9 g/dl) and moderate (7-9.9 g/dl) anaemia was the inclusion criteria of this study. The iron and folic acid rich biscuits contained fortified wheat flour, rice bran flour, soybean flour, gingelly seeds, peanut butter, egg, sugar and baking powder respectively. These especially prepared biscuits were supplemented for a period of three months to anaemic women placed in experimental group. The pre-test post-test haemoglobin serum iron and folic acid levels of experimental group was compared with control group. A statistically significant increase in haemoglobin, serum iron and serum folic acid levels respectively were noted among the experimental group after the supplementation of iron-folic acid rich biscuits.

B Rama Harika (2016) evaluated the impact of soyabean supplementation on nutritional status of 60 school going children. Anthropometric measurements, food frequency questionnaire and 24 hours dietary recall method were used for collection of data. Result reveal significant improvement of nutritional status of school going children of experimental group as compared to control group. It was concluded that soya bean supplementation is effective in improving nutritional status of school children.

Thirumani Devi & Samundeeswari (2013), Sharda Sidhu et al (2005), Jawarkar et al (2015), Bansal et al (2016), Upadhye et al (2017) explored the various factors associated with iron deficiency anaemia. Since none of the studies assessed the impact of dietary supplementation in the form of multigrain panjiri in management of anaemia in tribal ethnic women, the present study was planned.

Objectives

The objective of the present study was to find out the efficacy of dietary supplementation in the form of soya multigrain panjiri in the management of anaemia in tribal ethnic women of Chhattisgarh.

Materials and Methods: The study covered 100 tribal women from tribal dominated region of Chhattisgarh as sample. The age range of selected subjects was 19 to 25 years. The inclusion criteria for selection of subjects was WHO classification for anaemia. Purposive sampling was used for selection of subjects.

Estimation of haemoglobin –Haemoglobin levels of the samples was estimated by Cyanmet Haemoglobin

method. Pre-post randomized group experimental design was preferred to conduct the study.

Method and Procedure

First of all 100 anaemic tribal ethnic women aged 19 to 25 years were selected as per inclusion criteria. The formation of two groups i.e. experimental and control group respectively with equal number of subject was carried out with randomly assigning the subjects in two groups. Subjects of experimental group were supplemented with soya multigrain panjiri. An iron-rich nutritious soya multi grain panjiri was prepared for the purpose of supplementation to the experimental group; 75 gm (one small katorie) of soyamulti grain panjiri was measured on electronic weighing machine and packed for each sample per day. The haemoglobin estimation of subjects was redone after the completion of three months study period. On the basis of WHO classification for anaemia, frequency distribution was calculated. The results are presented in Table 1.

Results and Discussion

The pre-post frequency distribution on the basis of WHO classification of anaemia in different study groups is shown in Table 1.

In experimental group, pre-test statistics showed that 4 percent subjects had severe anaemia, 18 percent classified as moderately anaemic while 78 percent were mildly anaemic. The post-test frequency distribution for experimental group showed that none of the subjects had severe or in moderate anaemia category while 22.0 percent came under the category of mild anaemic. The post-test frequency distribution revealed that 78 percent women subjects had normal haemoglobin levels.

In control group, pre-test statistics showing that 4 percent subjects had severe anaemia, 14 percent had moderate anaemia while 82 percent had mild anaemia. The post-test frequency distribution in control group showed that 2 percent subjects had severe anaemia and 12 percent had moderate anaemia while 78 percent had mild anaemia. The post-test frequency distribution revealed that 8 percent women subjects had normal haemoglobin levels. Results indicate that supplementation of multigrain panjiri is beneficial in reducing iron deficiency anaemia in tribal women. This fact is verified by changes in anaemia profile of tribal women placed in experimental and control group.

Table 1: Pre-test post-test frequency distribution of selected ethnic tribal women on the basis of their anaemia profile (N=50)

Groups	Grades of anaemia	Pre-test		Post-test	
		f	%	f	%
Experimental group	Severe (Hb<7.9 g/dl)	02	4.0	-	-
	Moderate (Hb 8-9.9 g/dl)	09	18.0	-	-
	Mild (Hb 10-11.9 g/dl)	39	78.0	11	22.0
	Normal (Hb >12 g/dl)	-		39	78.0
	Total	50	100.0	50	100.0
Control group	Severe (Hb<7.9 g/dl)	02	4.0	01	2.0
	Moderate (Hb 8-9.9 g/dl)	07	14.0	06	12.0
	Mild (Hb 10-11.9 g/dl)	41	82.0	39	78.0
	Normal (Hb >12 g/dl)			04	8.0
	Total	50	100.0	50	100.0

In the present study multigrain panjiri was prepared by wheat flour 10 gm; soya flour 20 gm, black till 10 gm, ragi 10 gm, jaggery 20 gm and ghee 5 gm. Soybeans are very rich in nutritive components. Besides the very high protein content, soybeans contain a lot of fibre and are rich in calcium, magnesium and iron. Similar results were obtained by Gurwara & Barai (2016). Thus, dietary supplementation in the form of soya multigrain panjiri effectively improved the anaemia profile of tribal women.

Conclusion

On the basis of results of this study it can be concluded that dietary supplementation in the form of soya multigrain panjiri can be added in management of anaemia in tribal women along with other measures.

Recommendations

It is recommended that (1) more and more iron-rich ingredients can be added to multigrain panjiri so as to treat anaemia; (2) a full cost-benefit analysis of supplementation of multigrain panjiri be carried out with different ingredients; (3) the nutritional aspect of multigrain panjiri with different ingredients may be researched so as to prepare right mix of macro and micro nutrients in multigrain panjiri; and (4) in a developing country like India, multigrain panjiri should be looked as one of the most important nutrition intervention and provided to women of reproductive age group so as to control anaemia and increase their work efficiency.

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