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Research Article

Effect of Fiber Rich Product on Childhood Obesity and Lipid Profile Aged 10-12 Years

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ABSTRACT

The effect of fiber rich product on child hood obesity studied with 60 sample which were collected randomly among 10-12 years and categorized into 2 groups i.e, experimental group and control group. Experimental group further categorized into three groups i.e, supplementation with exercise (n=15), only supplementation group (n=15), only exercise group (n=15) and control group consists of (n=15).Anthropometric, and diet survey conducted as parameters. A fiber rich product was prepared and supplemented for 2 months to the selected subjects and it consists of whole Bengal gram, whole green gram, green peas, barley and jaggery. Positive results were obtained in three experimental groups. Significant decrease observed inweight, and BMI, Total cholesterol, Triglycerides, LDL, VLDL significant increase observed in HDL in group I II and III. The results were (51.60-48.26kg, 24.7-23.1, 195.2-152.3 mg/dl, 168.2-145.0 mg/dl, 52.2-54.13 mg/dl, 109.4- 69.4mg/dl, 33.6-28.7mg/dl) in group I, In group II the results are (50.3-49.86kg, 23.7-23.4, 168.6-161.0mg/dl, 145.4-129.6mg/dl, 44.2-45.2 mg/dl, 95.3-90.0mg/dl, 29.1-28.3mg/dl).In group III the tesults aere (50.7-49.6kg, 24.5-23.9, 143.2-139.3mg/dl, 139-134.5mg/dl, 38.2-38.7mg/dl 76.8-74.1 mg/dl, 25.6-28.1mg/dl) .From the results it was clear that when compared to group II and III group I has shown better results.

Key words: *Anthropometric measurements, Biochemical profile, Weight, BMI.*

INTRODUCTION

Obesity is very common among people living in western countries and among the highest income groups in India and developing countries. Obesity is a state in which there is a generalized accumulation of excess adipose tissue in the body leading to more than 20% of desirable weight.

Obesity is now widely prevalent in several developing countries, particularly these in rapid transition and is affecting children. Child hood obesity is associated with risk of dislipidemias, gallbladder diseases and osteoarthritis elevated B.P / hypertension etc.

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Obese children become targets of early in child hood and becomes progressively institutionalized children who are obese face complications which a raised due to obesity. Taking all the above considerations the present study was under taken.

For the present study a fiber rich product was prepared. Fiber provides a feeling of satiety and fullness in between and reduces hunger cravings ultimately, this helps to prevent unnecessary eating and excessive calories to exclude fat from the body which can lead to weight gain.

MATERIALS AND METHODS

Selection of subjects:

A sample of 60 obese children in the group of 10-12 years were selected randomly from 3 schools in Tirupati which were chosen at random. The sample were identified and categorised into experimental group and control group. Experimental group is again categorised into supplementation with exercise group (n=15) is a group 1, only supplementation group (n=15) is group 2, only exercise group (n=15) is group 3 and control group (n=15) is group 4.

Assessing the nutritional status of the obese children:

Height and weights of the obese children were accurately recorded, before and after the supplementation period of 60 days. Anthropometric measurements recorded in the study were height and weight and BMI was calculated as per the formula.

Body Mass Index (BMI) = weight in kg / height in m^2

Conduct of diet survey:

A formulated questionnaire was prepared to collect the information about dietary pattern, frequency of food intake, likes and dislikes of the different foods were noted. 24 hour recall method was used to know the respondent had eaten on a day, before the day. Information regarding family size, type of family and occupational status was collected from the subjects. Effect of supplementation of fiber rich product in controlling obesity from both the groups 1 and 2 were collected. And information regarding psychological, social and emotional problems of the subjects are also collected.

Biochemical Parameters:

Biochemical teats are considered as the most effective objective measures for assessment of the nutritional status of an individual. Blood lipid profile like total cholesterol, triglycerides, HDL, LDL, and VLDL cholesterols before and after supplementation collected.

The experimental groups were carefully monitored for ensuring the consumption of these fiber rich product through out the experiment period. The effect of supplementation was evaluated through assessment of lipid levels using suitable biochemical parameters namely Total cholesterol, HDL, LDL, VLDL cholesterol by CHOD/POD phosphotung state method and serum triglyceride levels were estimated by GPO/POD method with ESPAS.

Supplementation of fiber rich product:

Fiber rich diet provides fewer calories and less fat, leading to weight loss, or maintaining a healthy weight much easier. The aspects of diet composition, including high fiber, high protein, low fat intakes may play major role controlling of over weight / obesity. Fiber rich product consists of whole Bengal gram, whole green gram, green peas, barley and jiggery. Doing exercise with proper diet maintenance also may play role in controlling over weight / obesity in children. To the two experimental groups of 30 obese children supplemented with 30 g of Fiber rich product in the form of powder given daily (twice a day) for a period of 60 days. The fiber rich product contains 19.29 g of fiber per 100 grams and also contains the nutrients like calories 371.8 kcal, protein 19.09 g, fat 5.29gm, carbohydrate 61.29g, calcium 145.4 mg, carotene 147.25 ug per 100g of Fiber rich product.

RESULTS AND DISCUSSION

Back ground information:

Majority of obese children i.e, 96 percent belongs to nuclear family and remaining children belongs to joint family. In this 72 percent of obese children had 0.3 member in the family and remaining obese children had more than 6-7 members in their families.

Occupation status of the parents of selected obese subjects were engaged in sedentary activities. It was clearly showed in Table 1.

Food habits of the subjects:

Majority of the subjects were non vegetarians and consumed four meals a day. 68 percent of subjects were consuming outside foods frequently and the rest of the subjects were consuming home made foods. It is also clearly revealed by Table no 1.

Table 1: Percentage distribution of subjects regarding general information

Age of the individual n=60	Family size			Type of family		Out side foods	Home made foods	Non vegetarian	Vegetarian
	3-4	5-6	6-7	Joint	Nuclear				
10 year n=6	66.6	16.6	16.6	33.3	66.6	98.7	83.8	100	-
11 years n=29	75.8	20.6	3.4	3.4	93.6	84.8	93	100	-
12 years n=25	72	16	12	4	96	89.2	96	83	12

Anthropometric measurements:

Anthropometric measurements which include height, weight and BMI of the selected subjects are indicated in Table no 2. The mean values of weights and BMI of the selected subjects were compared before and after intervention.

Groups	Weight kg		BMI Weight/Height in m^2	
	Before	After	Before	After
Group 1	51.60	48.26	24.723	23.103
Group 2	50.53	49.86	23.78	23.48
Group 3	50.73	49.60	24.537	23.903
Group 4	50.53	50.53	24.549	24.549

Before and after supplementation, weight and BMI gradually reduced in obese children weight for age and height for age is the most reliable indicator of clinical nutrition. The increase in body weight may be due to high consumption of oily fish, deep fat fried foods, sweets, excess sugar intake. BMI is a main parameter to measure over weight / obesity. Group 1 showed significance difference at 1 percent level in the weight reduction and other experimental groups were showed significance at 5 percent level. Group 1 and 3 showed significant at 1 percent level in BMI and group 2 difference showed significance at 5 percent level.

Table 2: Highlights the data regarding the lipid profile parameters namely Total cholesterol, HDL cholesterols:

Groups	Total cholesterol		t_0	Triglycerides		t_0	HDL		t_0
	Before	After		Before	After		Before	After	
Group I	195.26 + 64.36	152.33 + 50.91	7.82**	168.200 + 40.13	145.067 + 35.1	12.53*	52.26 + 12.3	54.13 + 12.51	5.80**
Group II	168.66 + 54.86	161.00 + 54.57	7.642**	145.467 + 37.33	129.667 + 31.2	7.458**	44.200 + 13.0	45.267 + 12.71	3.37**
Group III	143.20 + 21.6	139.33 + 21.1	8.674**	139.067 + 27.8	134.53 + 27.9	4.90**	38.267 + 7.6	38.733 + 7.4	3.50**
Group IV	140.00 + 27.8	140.20 + 27.8	NS	130.800 + 20.8	130.800 + 20.8	NS	37.33 + 10.5	37.33 + 10.5	NS

Biochemical Profile:

Supplementation brought about a significant improvement in blood total cholesterol level of the supplementation with exercise group and other experimental groups. The statistical analysis revealed that there was significant difference at 1 percent level in the decrease of Total cholesterol in the group I. The fiber rich product has shown the effect on only supplementation and only exercise groups, but the effect is less. How ever it was revealed that there was significant difference at 5 percent level in other experimental groups.

Serum Triglycerides:

Serum triglyceride was highly clear headed in group I. When compared to other experimental groups and the difference was statistically significant at 1 percent level. Thus group I seemed to have the effect in improvement of serve triglyceride levels.

It onpar with another study Christopher, 2000 stated that diet and exercise together were associated with a significantly greater improvement in endothelial function that diet alone. Other experimental groups were significant at 5 percent level.

HDL Cholesterol:

In the group I children decreased their Total cholesterol, triglycerides and increased HDL cholesterol. In other experimental groups like group II and III children also improved HDL cholesterol but some what less. In all the experimental groups there is significant difference at 1 percent level. Hence supplementation with exercise method is best method to reduce obesity.

LDL cholesterol:

In all these experimental groups there was a significant difference at 1 percent level but group I was more effective than other 2 experimental groups. Supplementation of fiber rich product is also rich in protein and low fat product fiber binds with LDL, VLDL cholesterol levels.

According to samule the association of levels of physical activity on systolic blood pressure and LDL cholesterol, it is concluded that participating in intense physical activity with diet may reduce the elevated cholesterol levels.

SUMMARY AND CONCLUSION

From the results, it is clear that supplementation with exercise is the best method to reduce weight in children. A period of 60 days brought about significant, improvement in biochemical profile especially total cholesterol, triglyceride, HDL, LDL and VLDL cholesterol levels and BMI. It is essential to include fiber food and normal protein and regular exercise conspringly in the diet to have a good health. The maintenance of the body weight is to meet the nutritional needs for growth and development of the children especially 10-12 years. Supplementation with exercise is more effective than other methods however only fiber rich product supplementation also on par with the effect of supplementation with exercise but effectiveness is comparatively less. So that supplementation of fiber rich diet and exercise are advisable to maintain normal body weight and reduction of obesity.

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