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Research Paper Home Science

Effect of Supplementation of A Multinutrient Chocolate Bar on Nutritional Status and Athletic Performance

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ABSTRACT

Nutritious, well balanced and conducive diet can enhance the performance of athletes whereas unbalanced diet can equally spoil the performance. Sports nutrition has many modes to enhance performance. Hence the present study was conducted to assess the effect of supplementation of a multinutrient chocolate bar among athletes in YMCA, The College of Physical Education in Chennai. Fifty female athletes (swimmers) were selected and a specially designed interview schedule was given to elicit the background information and performance parameters (muscular strength, flexibility, balance, resting heart rate and blood pressure) of the athletes. A multinutrient chocolate bar was formulated, standardized, analyzed for nutrient content and supplemented to the sub sample of ten athletes (SEG) for three months. Fifteen athletes formed the control groups (SCG). The results showed that there was a significant increase in lean body mass and body mass index of the experimental group. Biochemical profile showed a significant improvement in random blood sugar, serum globulin and blood lactate. Intake in energy, protein, fat, calcium, iron, phosphorous, sodium and potassium were increased in SEG after supplementation. A significant change was observed in flexibility ($p<0.01$) of the SEG compared to the SCG.

Keywords : Swimmers, multinutrient chocolate bar, athletic performance

Introduction

Sports nutrition and exercise have thus been a part of man's life and his culture since the earliest times. Sports nutrition is the study and practice of nutritious diet as it relates to athletic performance. Nutritious, well balanced and conducive diet can enhance the performance of athletes whereas unbalanced diet can equally spoil the performance. Soy provides an excellent inexpensive source of protein particularly important to the economy of the average Indian. Soy contains proteins, soy iso-flavones and fiber. Soy is an excellent course of dietary protein including all essential amino acids. Soy is a source of lecithin or phospholipids. Soy isoflavones and lecithin have been studied scientifically for numerous health conditions. Isoflavones such as genistein are believed to have estrogens like effects in the body and as a result sometimes called phytoestrogens. And also soy has performance enhancing effect of performance of sports persons. Hence the present study on "Effect of Supplementation of a Multinutrient Chocolate Bar on Nutritional Status and Athletic performance" was carried out with the following objectives, to collect the background information on selected athletes (swimmers), to formulate, standardize and supplementation of a multinutrient chocolate bar to the selected athletes, to evaluate the impact of the multinutrient chocolate bar on nutritional status and performance parameters of the selected athletes.

Materials and methods

Phase I

The YMCA, College of Physical Education was selected because female swimmers are readily available and willing to participate in the study. Accordingly, 50 female athletes (swimmers) were selected and divided into two groups such as Experimental group (SEG) and Control group (SCG). Supplementation was given to the experimental group while no supplementation was given to the control group. Data regarding the general information, socioeconomic background, life style pattern, health and status were collected through the interview schedule. Information on dietary, food and nutrient intake pattern was elicited using separate dietary schedules. The nutritional status of the subjects was assessed by using ABCD protocol and the performance parameters (muscular strength, flexibility, balance, resting heart rate and blood pressure) of the subjects were assessed by using the appropriate physical performance tests.

Phase II

A Multinutrient Chocolate Bar was prepared by incorporating the following additional ingredients namely soy flour (5g, 10g, 15g), dates (15g) and rice flakes powder (15g) to the standardized chocolate recipe in different proportions. The most acceptable proportion (15gm of soy flour, dates (15g) and rice flakes (15g) was chosen for supplementation to the athletes. Two multinutrient chocolate bars per day (one bar=50g) was supplemented to the experimental group for three months. After the supplementation period the anthropometric measurements, biochemical analysis, dietary intake and performance parameter tests were assessed again to find out the impact of supplementation on these parameters.

Results and Discussion

A) General information about the athletes

Fifty 50 percent of the athletes were district players, 84 percent were state players, 10 percent were national players and only six percent of players did not participate at any level. All the athletes in the present study were found to be involved in heavy activity since they participated in endurance events. On the whole, 50 percent of the selected athletes felt stressed during competitive events and fifty percent of the athletes did not feel any stress during competition.

B) Anthropometric measurements

TABLE I

ANTHROPOMETRIC MEASUREMENTS OF THE SELECTED SWIMMERS

Anthropometric measurements	SCG (N=25)		't' value	SEG (N=25)		't' value
	Mean ± SD			Mean ± SD		
	Initial	Final		Initial	Final	
Weight	47.67 ± 4.981	48.60 ± 3.814	1.011 NS	47.80 ± 5.073	48.90 ± 3.542	1.408NS

BMI	19.87 ± 1.547	20.26 ± 1.003	1.081 NS	20.61 ± 1.498	21.33± 1.198	2.398*
WHR	0.7527 ± 0.0260	0.7560 ± 0.250	0.960 NS	0.7640 ± 0.5337	0.7660 ± 0.5232	1.500 NS
Body fat	17.9320 ± 3.5764	17.8707 ± 3.5189	1.739 NS	15.6900 ± 4.1102	15.3300 ± 4.2799	0.400 NS
Lean body mass	29.973 ± 4.5764	30.707 ± 3.7515	1.276 NS	27.061 ± 7.7039	33.810 ± 3.9363	2.837**

NS- Not significant; * - Significant at p<0.05 level; ** - Significant at p<0.01 level

According to ICMR (2009), the reference height of Indian adolescent girl is 164cm and reference weight is 54.4kg. In the present study both height and weight of the swimmers was lesser than the reference height and weight. The mean lean body mass of the experimental group before supplementation was 27.061 and after supplementation it increased (t = 2.398*) significantly (p<0.01) to 33.810. Significant change was also observed on body mass index of SEG statistically (t = 2.837*) at (p<0.05) level.

C) Biochemical analysis

The mean random blood sugar level of swimmers from experimental group before supplementation was very low 74.40 mg/dl and after supplementation it increased significantly (p<0.05) to 110 mg/dl, while the change was not significant in the control group. The mean blood lactate of the experimental group was 3.960 before supplementation and it was reduced significantly (p<0.01) to 3.320 after supplementation. The difference in serum globulin between the experimental group and the control group was statistically significant at one percent level.

D) Dietary pattern

Sixty eight percent of the athletes were found to be non vegetarians, 12 percent were vegetarians, four percent were ova vegetarians and eight percent were lacto vegetarians. Majority of the athletes (90 percent) had fluid intake level between 2-4 liters and only 10 percent had 4-6 liters of fluid per day. The athletes food intake showed deficits in cereals (-41%), pulses (-32.2%), roots and tubers (-54.5%), other vegetables (-52%), fruits (-9 %) which were lesser than the suggested allowances given by ICMR (2007) and excess consumption was seen for meat and poultry, milk and milk products, sugar and jaggery and fats and oils. The nutrient content of the formulated chocolate bar was analyzed for energy (405 Kcal), protein (7.8g), fat (11g), calcium (384mg), iron (11.4 mg), potassium (272 mg) and sodium (110 mg). The nutrient intake of athletes before supplementation was deficient in energy (-2.2 percent), iron (-37 percent) and folate (-37 percent), while the other nutrients such as protein, fat, calcium, thiamine, riboflavin and folate intake were higher than the RDA (ICMR, 2009). After supplementation the deficit was improved from minus 2.2 percent to an excess of 1.5 percent for energy. Protein intake was increased by four percent, fat by 170 percent and calcium by 83.5 percent, while no change was observed on the intake of other nutrients.

E) Performance parameters

Table II showed the performance parameters of swimmers before and after supplementation.

TABLE II
PERFORMANCE PARAMETERS OF THE SWIMMERS (N=25)

Parameters	SCG		't' value	SEG		't' value
	Mean ± SD			Mean ± SD		
	Initial	Final		Initial	Final	
Muscular strength	2.47 ± 0.516	2.53 ± 0.516	0.435 NS	3.00 ± 0.667	3.30 ± 0.483	1.152 NS
Flexibility	3.60 ± 0.50	3.53 ± 0.516	0.323 NS	3.60 ± 0.516	4.30 ± 0.483	3.280**
Balance	2.33 ± 0.488	2.40 ± 0.507	0.435 NS	2.80 ± 0.422	2.80 ± 0.422	0.000 NS
Systolic pressure	118 ± 7.746	117.33 ± 7.988	0.222 NS	120 ± 9.428	117 ± 8.233	0.709 NS
Diastolic pressure	76.67 ± 8.105	78.67 ± 6.399	0.899 NS	76 ± 5.164	78 ± 6.325	0.6 NS

NS- Not significant; * - Significant at p<0.05 level; ** - Significant at p<0.01 level α Davis (2000); β Arnot (2000); γ McArdle (2001); δ Chatterjee (2004)

The mean muscular strength of the swimmers from the experimental group before supplementation was 3.00 and it increased to 3.30 after supplementation which was not statistically significant). The mean flexibility of the experimental group before supplementation (was 3.60 and it increased significantly (p<0.01) to 4.30(t = 3.280**). The changes observed on systolic pressure, diastolic pressure and resting heart rate of both experimental and control groups were not statistically significant.

Conclusion

From the obtained results, it was concluded that the supplementation had an impact on anthropometric measurements such as body weight, BMI, Lean body mass, Biochemical profile (blood glucose and blood lactate), dietary intake and physical performance (Flexibility) of the selected experimented swimmers.

REFERENCES

• Jain R (2005), "Play and learn Swimming", Khel Sahitya Kendra, New Delhi, P 9-10. • Manufacturer's data, Protein Technologies International, 2001. • National Institute of Nutrition (2009), Hyderabad • Protein Technology International. Soy protein and human health: Discovering a role for soy protein in fight against coronary heart disease, Houston, Texas; Marimac Communications; 1996, Publishe. • Rossi A, DiSilvestro RA, Blostein-Fujii A (2000), Soy beverage consumption by young men: Increased plasma total antioxidant status and decreased acutre, exercise-induced muscle damage. J. Nutraceuticals, Functional & Medicinal Foods, 3(1):33-44. • Salmon P (2001), Effects of Physical Exercise on Anxiety, Depression, and Sensitivity to Stress: A Unifying Theory , Clin Psychol Rev 2001 Feb;21(1):33-61 • Soy in Human Health 2000,(25) • Wernor W.K. Hoeger (2009), Principles and Labs for Physical Fitness and Wellness, Motors Publishing Company, Englewood. • World Health Organization (2004), BMI Classification.

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