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Dietary pattern of young Manipuri athletes from India: A cross sectional study

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Abstract

Objective: The main purpose of this study was to determine the dietary pattern of Manipuri runners from India.

Method: Interview cum 24 hour food recall method filled by the 67 male athletes themselves was used for collection of dietary habit of the runners. The nutritive value was calculated by using Microsoft Excel Sheet tool developed based on the table given by National Institute of Nutrition, India for Indian food Ingredients. Descriptive analysis was used for analysis of data.

Result: The food pattern was found to be less than the recommended allowances for athletes. They consumed a mean energy of 1587 ± 74.7 kcal. Carbohydrate, fat and protein contributed to 56.6, 11.6 and 6.8 (%) of the total pattern of energy.

Conclusion: Manipuri runners` consume imbalance dietary pattern and is less compared to recommended level. Nutrition knowledge programme regarding recommended dietary pattern role of various macro and micro nutrients is necessary. Nutritional education should focus on promoting a balanced diet, providing all energy and nutrients in adequate amounts.

Keywords: Manipuri, diet, macronutrient, micronutrient

1. Introduction

Sports education is one of the most important factors contributing sports performance. Sports Education is not the education for earning degree or diploma in physical education and sports science courses. It means educating the professional sportsperson about the knowledge of nutrition (pre, during and post competitions), latest rules and regulations, self-disciplines (on the field, off the field), etc. In Manipur, the north eastern part of the India, most of the athletes are from low socio-background group and the diet they consume is not up to the mark and might not have knowledge of nutrition. It is very important to find out the dietary pattern and nutrient adequacy of athletes. Therefore, the present study evaluates the status of dietary pattern of Manipuri male runners from India.

2. Method

2.1 Participants

Written consent was obtained from each subject. Sixty seven (67) male runners (aged=19.9 \pm 2.4yrs; Body mass=55 \pm 12.2kg) who participated in 36rd State Age Group Athletic Championship, 2016 organised by Athletic Association of Manipur, India was recruited as subject.

2.2 Material

Interview as well as 24 hour Dietary Pattern Questionnaire was distributed to the athletes for collection of dietary pattern for 7-days. Body mass was measured using Tanita TBF 300 A made in Japan, Tokyo.

2.3 Procedure

The following macro-nutrients were evaluated: carbohydrates, fats, and proteins. The micronutrients that calculated were calcium, iron, carotene, riboflavin, thiamine and vitamin C.

The nutritive value was calculated by using Microsoft Excel Sheet tool developed based on the table given by National Institute of Nutrition, India (NIN) for Indian food Ingredients. To calculate the energy Nutritive value of Indian food (Gopalan C. *et al.*, 1985) [1] were referred and various micro and macro nutrient pattern from different source. The calculated energy and macro nutrient pattern were compared with the recommended pattern levels for Group III (middle and long distance) category as recommended by NIN (2007) [2] and micro nutrient pattern were compared by Indian Council of Medical Research (ICMR), 2010 [3]. Excess and deficit percentage of food intake was calculated by using the following formula: Excess/Deficit (%): $\text{AFI-RDA/RDA} \times 100$; where, AFI; Actual Food Intake, RDA; Recommended Daily Allowance. Descriptive analysis was used for analysis of data.

3. Result and Discussion

Table 1 represents the mean food adequacy of the runners. It is well known that adequate nutrition is critically important for the achievement of the athlete's optimal performance. They consumed a mean energy of 1587 ± 74.7 (kcal). These values are below the recommended level for highly active people. Maughan *et al.*, 2004 [4] recommended eating habits that meet energy demands and maintenance of body mass and body fat at the appropriate level are key goals for athletes. Rosenbloom *et al.*, 2002 [5] also recommended that unhealthy dietary habits not only affect the performance in the competition but also provides a negative impact on their overall health.

The food pattern was found to be of lesser level (deficit) than the recommended allowances, except the level of leafy vegetables consumption which show slight excess of 3.3 per cent. The inadequate consumption of food pattern by the runners in the present study may be due to lack of awareness about recommended dietary allowance. Sedek Razalee and Yih Yun Tan in 2014 [6] reported in their study a positive significant relationship between nutrition knowledge and dietary habits among athletes.

Table 2 reveals the macro nutrient pattern of Manipuri runners. It was found that all the athletes were consuming imbalance pattern of nutrients as compared to the

recommended value suggested by the NIN for specific event and ICMR (2010) [3]. The carbohydrate is the main energy source and a high-carbohydrate diet (7-10 g/kg body mass (BM) has therefore been recommended (Burke, L.M., Cox GR., Culmings NK., *et al.*, 2001) [7]. Proteins have a low contribution to the energy production (5%), and the daily pattern of 1.2- 1.7g/kg of BM has been proposed as adequate recommendations regarding the consumption of fat suggest a pattern of 20-35% of the total energy pattern (Maughan *et al.*, 2004) [4].

Athletes from the present study had a marginal intake of carbohydrate, protein and energy but poor pattern of fat (Table 2). Carbohydrate, fat and protein contributed to 56.6, 11.6 and 6.8 (%) of the total pattern of energy. A general recommendation for all athletes is to consume 60–70% of total energy pattern from carbohydrates (CHO), 12–15% from proteins, and 25–30% from fats (Katch, F., W. McArdle, 1993) [8].

Table 3 represents the mean (%) deficit of carotene, riboflavin, and thiamine was 53.10, 23.8, and 52.9 respectively. However, the calcium, Iron and vitamin C pattern were excess of 17.8, 1.2 and 12.5 percent respectively. The excess in Calcium is mainly from the consumption of snails and meat which plays an important role in haematopoiesis for increasing the absorption of iron (Sedeaud, A., Marc, A., Marck, A., *et al.*, 2014) [9].

4. Conclusion

The dietary pattern of Manipuri runners was low as compared to the recommended level. The main reason for low RDA is imbalance dietary pattern and lack of knowledge of nutrition. The inadequate energy and nutrient pattern in the Manipuri runners could put the athletes at risk of nutritional deficiencies, and possibly compromise their athletic performance. Therefore, it is recommended to establish a nutrition knowledge programme regarding recommended dietary pattern role of various macro and micro nutrients.

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Table 1: Food pattern of athletes (g /day)

Nutrient	@RDA	Actual pattern	Excess/Deficit (%)
Cereals (g)	630	550	-12.7
pulses (g)	40	15	-62.5
Leafy Vegetables (g)	150	155	3.3
Other Vegetables (g)	200	80	-60
Root and Tubers (g)	150	80	-46.6
Fruits (g)	200	60	-70
Milk (ml)	750	300	-60
Meat (g)	250	200	-20
Egg (g)	150	80	-46.7
Sugar (g)	80	40	-50
Oils (g)	50	40	-20

Source: @ National Institute of Nutrition, India (2007) [2]

Table 2: Macro Nutrient Pattern (N= 67)

Nutrient	RDA*	Actual Pattern	Excess /deficit (%)
CHO (g)	654 (11.9)	522 (9.5)	-20.2
Protein (g)	159.5 (2.9)	104 (1.9)	-34.8
Fat (g)	137.5 (2.5)	60.5(1.1)	-56
Energy (kcal/day)	4400 (80)	3118.5(56.7)	-29.1

*Values for per kg body weight in parenthesis according to Indian National Institute of Nutrition

Table 3: Mean Micro Nutrient Pattern of Athletes

Nutrient	#RDA	Actual Pattern	Excess /Deficit (%)
Calcium (mg/day)	600	707	17.8
Iron (mg/day)	17	17.2	1.2
Carotene (mg/day)	4800	2251	-53.10
Riboflavin (mg/day)	2.1	1.6	-23.8
Thiamine (mg/day)	1.7	0.8	-52.9
Vitamin C (mg/day)	40	45	12.5

Indian Council of Medical Research (ICMR) (2010) ^[3]

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