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Evaluation of diet, anthropometry and immunocompetence of young male athletes

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Currently, it is well accepted that nutrition is an important factor for the development of the immune response. Epidemiological and clinical results suggest that any nutritional deficiency alters immunocompetence and increases the susceptibility to infections^(1,2). thus, the purpose of the present study was to compare the nutritional status of ten young male elite track and field athletes (20–48 h training/week) aged 13–18 years at a baseline state (48 h relaxation after training) with a control group consisting of ten volunteer students, matched by age and socio-economic status, who were doing <8 h physical exercise/week. Nutritional status was assessed by dietary intake for 3 d, anthropometry (BMI and triceps skinfold thickness) and immunocompetence (total counts of leucocytes, lymphocytes and lymphocyte subsets (CD3, CD4, CD8, CD19 and CD16+56)).

The energy intake was similar for athletes and controls (8327 v. 8235 kJ/d respectively), and lower than that recommended by the Food and Nutrition Board, Institute of Medicine⁽³⁾, the American Dietetic Association⁽⁴⁾ and the American Academy of Pediatrics⁽⁵⁾. BMI and triceps skinfold thickness were significantly lower for the athletes than for the controls. Total leucocyte and total lymphocyte counts were similar for both groups. However, a decrease in CD3, CD8, CD19 and CD16+56 lymphocyte subset counts was found for athletes in comparison with controls.

	Controls (n 10)		Athletes (n 10)	
	Mean	SD	Mean	SD
Age (years)	16.3	1.38	17.1	0.80
Energy intake (kJ)	8235	672	8327	584
Anthropometric variables				
Weight (kg)	68.7	6.63	63.7	7.63
Height (m)	1.75	0.68	1.76	0.77
BMI (kg/m ²)	22.5	1.18	20.7*	2.00
Triceps skinfold thickness (mm)	11.9	2.78	5.67*	1.1
Immunological variables				
Total leucocytes (cells/mm ³)	6287	1533	5786	1026
Total lymphocytes (cells/mm ³)	3413	1003	3527	918
Lymphocyte subsets (cells/mm ³):				
CD3	1380	418	919*	380
CD8	659	224	432*	151
CD19	248	54	179*	60
CD16 + 56 (NK cells)	257	73	185*	59

NK, natural killer. Mean values were significantly different from those of the controls (Student's *t* test): **P*<0.05.

These results suggest that the young athletes assessed in the current study could show subclinical malnutrition, with a leaner body and an impaired immunocompetence compared with the control group, although the dietary intake was similar for both groups but below recommendations. A higher-energy diet should be recommended for these high-performance athletes in order to avoid further risk of malnutrition and to avoid more serious complications, such as infections.

1. Gleeson M, Nieman DC & Pedersen BK (2004) *J Sport Sci* **22**, 115–125.
2. Moreira A, Kekkonen RA, Delgado L, Fonseca J, Korpela R & Hahtela T (2007) *Eur J Clin Nutr* **61**, 443–460.
3. Food and Nutrition Board, Institute of Medicine (2002) *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein and Amino Acids (Macronutrients)*. Washington, DC: National Academy Press.
4. American Dietetic Association (2000) *J Am Diet Assoc* **100**, 1543–1556.
5. American Academy of Pediatrics (2006) *Pediatrics* **111**, 544–559.