Association Of Adequate Carbohydrate And Protein Intake And Maximal Dynamic Strength In University Athletes

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ABSTRACT:

PURPOSE: To analyze the association between the adequate carbohydrate and protein intake with the maximal dynamic strength in bench press and deadlift in university athletes.

METHODS: 30 male college (soccer and fast-soccer) athletes were evaluated. A 24-h dietary recall was administered to determine the macronutrient intake. Carbohydrate (CHO) and protein (PRO) intake was calculated and adjusted for body mass (g/ kg/ day). Consumption was classified as "adequate" if the athlete consumed the minimum amounts recommended for each macronutrient: 5 g/kg/day of CHO, 1.2 g/kg/day of PRO. A bench press and deadlift one repetition (1RM) test was performed to determine the maximal dynamic strength. 1RM was adjusted for body mass (kg lifted/kg body mass). The association between macronutrient intake and 1RM was tested with linear regression. A sub analysis was performed with subject's categorization according to their CHO and PRO adequacy.

RESULTS: Neither g/d nor g/kg/d of CHO nor PRO were significantly associated with 1RM bench press nor deadlift. When participants were selected for their CHO (n=18) and PRO (n=29) adequacy there were no significant associations between CHO with 1RM of bench press ($p = 0.763$) and deadlift ($p = 0.397$). PRO showed the same pattern with no significant associations with bench press ($p = 0.595$) and deadlift ($p = 0.912$).

CONCLUSIONS: No association was observed between the adequate carbohydrate and protein intake with the 1RM of bench press and deadlift in university soccer players.

INTRODUCTION

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Resistance training is the most effective method available for maintaining and increasing lean body mass and improving muscular strength and endurance (1).

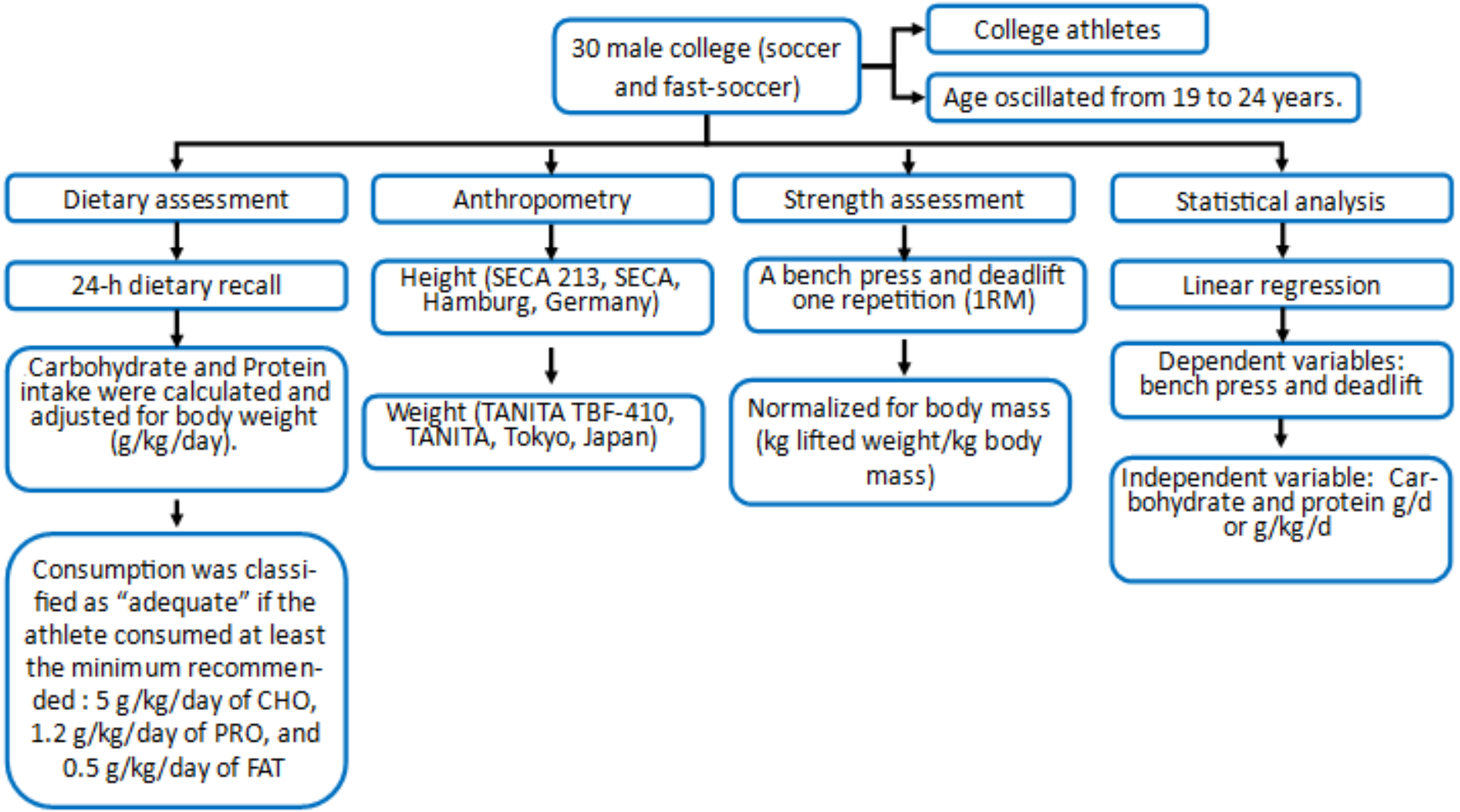
Determination of 1RM is the process of identifying a load that can moved through the entire range of movement only once (2).

Strength plays an essential role in a large number of sports disciplines. It can be defined as an external manifestation (applied force) that is made up of the internal tension generated in the muscle (3,4).

Proper nutrición intake is necessary to improve exercise performance. (1) Dietary carbohydrate and protein provide the requisite substrates to enhance glycogen resynthesis and remodel skeletal muscle proteins. (5,6) Some sports-related tasks (like maximal dynamic strength) depend on several factors like type of training, supplementation, and overall diet.(7)

Therefore, the purpose of this study was to analyze the association between the adequate carbohydrate and protein intake with the maximal dynamic strength in university athletes.

METHODS


30 male college (soccer and fast-soccer)
College athletes
Age oscillated from 19 to 24 years.
Dietary assessment
24-h dietary recall
Carbohydrate and Protein intake were calculated and adjusted for body weight (g/kg/day).
Consumption was classified as "adequate" if the athlete consumed at least the minimum recommended : 5 g/kg/day of CHO, 1.2 g/kg/day of PRO, and 0.5 g/kg/day of FAT
Anthropometry
Height (SECA 213, SECA, Hamburg, Germany)
Weight (TANITA TBF-410, TANITA, Tokyo, Japan)
Strength assessment
A bench press and deadlift one repetition (1RM)
Normalized for body mass (kg lifted weight/kg body mass)
Statistical analysis
Linear regression
Dependent variables: bench press and deadlift
Independent variable: Carbohydrate and protein g/d or g/kg/d

RESULTS

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Table 1. General subjects characteristics.

	Mean	SD
Weight (kg)	70.1	8.4
Height (cm)	173.9	5.7
Age (years)	21.2	1.2

Table 2. Association of carbohydrate and protein intake with maximal dynamic strength.

	Bench press		Deadlift	
	b (95% CI)	p-value	b (95% CI)	p-value
Protein (g/kg/d)	0.075 (-3.874 to 5.652)	0.704	0.023 (-7.154 to 8.036)	0.906
Protein (g/d)	0.145 (-0.430 to 0.920)	0.461	0.130 (-0.750 to 0.147)	0.511
Carbohydrate (g/kg/d)	0.176 (-1.438 to 3.731)	0.370	0.101 (-3.084 to 5.147)	0.611
Carbohydrate (g/d)	0.255 (-0.110 to 0.540)	0.191	0.233 (-0.220 to 0.086)	0.234

Neither g/d nor g/kg/d of CHO nor PRO were significantly associated with 1RM bench press nor deadlift. When participants were selected for their CHO (n=18) and PRO (n=29) adequacy there were no significant associations between CHO with 1RM of bench press (p = 0.763) and deadlift (p = 0.397). PRO showed the same pattern with no significant associations with bench press (p = 0.595) and deadlift (p = 0.912).

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CONCLUSIONS

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- No association was observed between the adequate carbohydrate and protein intake with the 1RM of bench press and deadlift in university soccer players.
- It could be explained because although adequate consumption of carbohydrates and proteins was obtained are not factors of direct use to obtain energy during the repetition of the maximal dynamic strength.

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