Association Between Carbohydrate Intake And The Dental Caries Presence In University Athletes

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ABSTRACT:

PURPOSE: To analyze the association between carbohydrate intake and consumption of sugar group servings with the presence of dental caries in college athletes.

METHODS: 159 (90 men, 69 women) college athletes from different sports were evaluated. 24-hour dietary recalls were administered to estimate the carbohydrate intake and the number of sugar servings consumed. In the same period, a dental evaluation was performed to determine oral health and possible dental injuries (specifically dental caries). Logistic regression analysis was performed to analyze the association between carbohydrate intake (g/day, g/kg/d, or categories as ≤3 g/kg/day, 3.1 to 5 g/kg/day, and > 5.0 g/kg/day), sugar group servings (sugar, honey, jam, jelly, sweet beverages) and the presence of dental caries.

RESULTS: 22 athletes (13.8%) presented dental caries. Carbohydrate intake was not significantly associated with dental caries when expressed in g/d (OR [95% CI], 1.00 [0.996 1.003]; p =0.801), nor g/kg/d (0.992 [0.799 - 1.232]; p=0.943). The amount of sugar servings consumed was neither significantly associated with caries (1.010 [0.940 - 1.084]; p=0.793). In the analysis by carbohydrate categories (≤3 g/kg/day reference group) consuming 3.1 to 5 g/kg/day (0.779 [0.191 - 3.180]; p=0.728), neither >5.0 g/kg/day (1.3030 [0.487-3.484], p=0.598) were significantly associated with the presence of dental caries. Even after adjustig the model, there were no significant associations with carbohydrate and sugar servings with dental caries .

CONCLUSIONS: Carbohydrate intake (expressed as g/d, g/kg/d, and categories) nor the number of sugar servings consumed were associated by themselves with the presence of dental caries. Further research is needed to elucidate if other non-dietary variables might modulate the association of carbohydrate intake and the presence of dental caries.

INTRODUCTION

Oral health is an integral part of general health.

Caries risk and disease levels have repeatedly been found to be high in athletes. There are many potential challenges to the oral health of athletes including nutritional; usual diet, sports drinks and supplements, the frequent carbohydrate intake and reduced salivary flow, oral dehydration, exercise-induced immune suppression, lack of awareness, negative health behaviors and lack of prioritisation[1,2]. Needleman mentions that the pain derived from these conditions, the increase in systemic inflammation and the psychosocial problems can affect training and sports performance [3].

There is sound evidence that high carbohydrate availability is desirable in the competition setting where it may contribute to optimal performance, maintains an adequate supply of carbohydrate substrate for the muscle and central nervous system[4], however, this is a risk factor thus the purpose of this study was, analyze the association between carbohydrate intake and consumption of sugar group servings with the presence of dental caries in college athletes, as the only predictive factor.

METHODS

Subjects

159 (90 men, 69 women) college athletes from different sports were evaluated: athletics (24), baseball (5), basketball (20), boxing (8), fencing (9), flag football (11), indoor soccer (17), soccer (17), aerobics gymnastics (11), weightlifting (3), judo (11), wrestling (6), softball (5), table tennis (4), Tae Kwon Do (1), triathlon (1), indoor volleyball (6). Age oscillated from 15 to 27 years.

Anthropometric and body composition

Basic anthropometric measurements; height (SECA 213, SECA, Hamburg, Germany); weight (TANITA TBF-410, TANITA, Tokyo, Japan) were performed following a standardized protocol[5].

Assessments Dietary

We evaluated their food intake with a 24-h dietary recall to estimate the carbohydrate intake and them consumption was classified in g/day, g/kg/d, or categories as ≤3 g/kg/d, 3.1 to 5 g/kg/d, and > 5.0 g/kg/d), and the number of sugar group servings (sugar, honey, jam, jelly, sweet beverages).

Assessment Dental

A dental evaluation was performed to determine oral health and possible dental injuries, specifically dental caries. The dental evaluation involved the participation of the dentist.

Statistic analysis

Logistic regression analysis was performed to analyze the association between carbohydrate intake for categories and sugar group servings, and the presence of dental caries.

RESULTS

Subjects general characteristics is shown in table 1.

22 athletes (13.8%) presented dental caries. Carbohydrate intake was not significantly associated with dental caries when expressed in g/d (OR [95% CI], 1.00 [0.996 1.003]; p =0.801), nor g/kg/d (0.992 [0.799 - 1.232]; p=0.943). The amount of sugar servings consumed was neither significantly associated with caries (1.010 [0.940 - 1.084]; p=0.793). In the analysis by carbohydrate categories (≤3 g/kg/day reference group) consuming 3.1 to 5 g/kg/day (0.779 [0.191 - 3.180]; p=0.728), neither >5.0 g/kg/day (1.3030 [0.487-3.484], p=0.598) were significantly associated with the presence of dental caries.

	Total (n=159)	Men (n=90)	Women (n=69)
Weight (kg)	65 (58-74)	70 (64-80.2)	58 (52.5-65)
Height (cm)	169.1 (162.5- 175)	175.4 ± 7.6*	162. 5 ± 5.6*
Age (years)	20 (19-21)	20 (19-22)	20 (19-21)

Data expressed as median (25th—75th percentiles).

*Data expressed as mean ±SD.

Table 1 General subjects characteristics (n=159)

Even after adjustig the model, there were no significant associations with carbohydrate and sugar servings with dental caries (Table 2).

Model	Variables	OR	CI 95%	p-value
1	Sugar servings	1.022	0.937 to 1.115	0.620
	CHO (g/d)	0.999	0.995 to 1.115	0.633
2	Sugar servings	1.014	0.935 to 1.100	0.736
	CHO (g/kg/d)	0.973	0.760 to 1.246	0.827
3	Sugar servings	1.012	0.937 to 1.093	0.760
	CHO (3.1 to 5 g/kg/d)	1.639	0.419 to 6.416	0.478
	CHO (>5.0 g/kg/d)	1.200	0.274 to 5.266	0.809

Adjusted model 3: ≤3 g/kg/day reference group.

CHO: Carbohydrates.

Table 2. Adjusted model analysis between carbohydrate intake and dental caries (n=159)

CONCLUSIONS

In this study, neither carbohydrate intake (expressed as g/d, g/kg/d, and categories) nor the number of sugar servings consumed were associated by themselves with the presence of dental caries.

Further research is needed to elucidate if other non-dietary variables might modulate the association of carbohydrate intake and the presence of dental caries.

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