Determination of the Glycemic and Insulinemic Indexes of Raisins in Three Populations
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Abstract

Methods, continued

Results

Abstract No. 391.6 Raisins are a low to moderate GI food and their insulin index is proportionate to their GI, regardless of the population studied.

Introduction

The GI concept has been applied in sports nutrition, weight loss, and in the dietary management of diabetes. In addition, there is considerable scientific agreement that high fasting and/or postprandial insulin levels increase cholesterol synthesis and impair fat mobilization from adipose tissue. Thus, it is increasingly recognized that the knowledge of the GI of a food is not complete without the knowledge of the insulin response as well. Foods with low postprandial blood glucose or insulin responses would be helpful to athletes and to people with diabetes or impaired glucose tolerance. There are only limited published data regarding the GI of raisins and none for their insulin index. In addition, it is not known if the GI of raisins obtained in healthy subjects would apply to athletes or people with pre-diabetes. Therefore, the objective of this study was to determine the glycemic and insulimetric indexes of raisins in 3 groups: 1) a healthy, young adult, non-athletic group; 2) a group of young adult competitive aerobic athletes; and 3) a group of people with impaired fasting glycemic or pre-diabetes.

Methods

The study consisted of 10 healthy sedentary persons (S), 11 endurance athletes (A) and 11 pre-diabetic individuals (P). Informed consent was obtained from subjects prior to the screening test.

Methods, continued

Table 1. Subject characteristics

<table>
<thead>
<tr>
<th>N (M/F)</th>
<th>S</th>
<th>A</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>25.7±1.3</td>
<td>23.1±1.0</td>
<td>50.0±2.6</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>166.4±2.5</td>
<td>175.8±2.4</td>
<td>167.2±2.6</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>64.8±4.5</td>
<td>74.8±2.9</td>
<td>94.5±6.6</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>23.3±1.7</td>
<td>24.1±0.3</td>
<td>32.6±1.9</td>
</tr>
</tbody>
</table>

Blood sample analysis

Blood samples were collected via capillary finger-stick at baseline (0), 15, 30, 45, 60, 90, and 120 minutes for the P group after administration of test meal. Whole blood samples were centrifuged for 10 minutes to get serum. Serum glucose concentrations were measured using the YSI 2700 Select Biosensor Analyzer (YSI Inc., Yellow Springs, Ohio). Serum insulin was assessed by Enzyme Linked Immunosorbent Assay (ELISA) using an insulin DSL-101600 ELISA kit (DSL, Inc., Webster, Texas).

Calculation of GI and insulin index of raisins

The positive Incremental Area Under the Curve (IAUC) for blood glucose were calculated geometrically.

Calculation of the insulinemic index of raisins

The area under the curve for serum insulin was calculated geometrically.

Results

Figure 4. Serum insulin responses to raisins and glucose in the sedentary, athletic, and pre-diabetic groups. Data points are the mean ± SEM.

Conclusions

Raisins are a low to moderate GI food and their insulin index is proportionate to their GI, regardless of the population studied. Athletes were able to normalize postprandial glycemia with lower insulin secretion.

Acknowledgements

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