Study population

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Abstract : Background: The thermic effect of food (TEF) is higher in lean than in obese human subjects.
Objective: Relationships between TEF and insulin resistance during meals, from the point of view of autonomic nervous activity, were evaluated.
Methods : Autonomic nervous activity was evaluated in 20 young adults using the spectral analysis of heart rate variability from one hour before to two hours after a meal. Heart rate data were analyzed based on low frequency components (LF power, 0.04 - 0.15 Hz), high frequency components (HF power, 0.15-0.40 Hz), and LF/HF ratios. Energy expenditure and the TEF were measured 30 min after a meal. Homeostasis model of insulin resistance index (HOMA-IR) was also measured.
Results : The LF/HF ratio was significantly increased 30 min after a meal (p<0.05). No correlation between LF power and HF power with TEF was found, but the LF/HF ratio was significantly and positively correlated with TEF (r = 0.56, p<0.05). Moreover, a significant negative correlation was found between the HOMA-IR and TEF (r = -0.601, p<0.05).

Keywords : thermic effect of food (TEF), insulin resistance, autonomic nervous activity, heart rate variability
Experimental protocol

1) Assessment of insulin resistance

2) Spectral analysis of heart rate variability

3) Expiratory gas analysis

Statistical analysis

1) Energy expenditure and spectral heart rate variability at the pre- and postprandial phases
2) Relationship among HOMR-IR, autonomic nervous activity and TEF

The relationship among HOMR-IR, autonomic nervous activity and TEF is depicted in the following graphs. The graphs show changes in heart rate variability (LF, HF) and LF/HF ratio before and after a meal at 30 and 60 minutes. The data indicate a significant decrease in LF and an increase in HF after meal consumption, with a resulting decrease in LF/HF ratio.

Before a meal  
30 minutes after  
60 minutes after

<table>
<thead>
<tr>
<th>Condition</th>
<th>LF (msec^2)</th>
<th>HF (msec^2)</th>
<th>LF/HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>156</td>
<td>127</td>
<td>1.2</td>
</tr>
<tr>
<td>30 min</td>
<td>878</td>
<td>371</td>
<td>5.5</td>
</tr>
<tr>
<td>60 min</td>
<td>244</td>
<td>159</td>
<td>0.66</td>
</tr>
</tbody>
</table>

The graphs illustrate the significant changes in heart rate variability and LF/HF ratio, with p-values indicating statistical significance.

p=n.s.  

p<0.05  

p<0.01
1) Relationships between the thermic effect of food, autonomic nervous activity and insulin resistance

2) Relationship between thermic effect of food and obesity
3) Obesity and autonomic nervous activity

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UIF )0."*3 BOE 5&' BT TIPXO JO 'JHVSF 5IF GJOEJOHT PG QSFTFOU TUVEZ TVHHFTU UIBU B SFEVDUJPO JO QPTUQSBOEJBM FOFSHZ FYQFOEJUVSF BSF EJTUVSCFE JO QSFPCFTF TVCKFDUT JO UIF QPTUQSBOEJBM QIBTF PS OPU #FDBVTF JU JT OPU QPTTJCMF UP QSFEJDU XIFUIFS OPSNBM XFJHIU TVCKFDUT XJMM CFDPNF PCFTJUZ JO UIF GVUVSF JU JT EJGGJDVMU UP EFNPOTUSBUF UIJT IZ

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