Heart Rate and Rating of Perceived Exertion During High-Intensity Interval Training: Implications for Prescribing Intensity

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Heart Rate and Rating of Perceived Exertion During High-intensity Interval Training: Implications of Prescribing Intensity

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Introduction

High-intensity interval training (HIIT) has become a popular time efficient alternative to traditional moderate-intensity continuous training. However, current exercise prescription of HIIT often involves monitoring heart rate or workload which may limit the accessibility of this training modality. Rating of perceived exertion (RPE) has been utilized as a practical way to prescribe exercise intensity, as RPE has been positively associated with physiological markers of intensity. Little research has investigated the relationship among RPE and physiological markers of intensity, such as heart rate, during HIIT. Therefore, the efficacy of using RPE to prescribe intensity for HIIT is relatively unknown.

Purpose

To determine heart rate and RPE responses across a bout of HIIT, as well as examine the relationships between heart rate and RPE.

Methods

Young Adults (n = 16)

Anthropometric Measures

Height, Weight, & Age

Incremental Exercise Test

VO₂peak & Peak Power Output

HIIT Training Session

Heart Rate & RPE

Results

Table 1. Baseline participant characteristics (n = 16)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>21.8</td>
<td>± 1.4</td>
<td>20.0 – 25.0</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>164.1</td>
<td>± 10.5</td>
<td>138.0 – 184.0</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>68.7</td>
<td>± 10.0</td>
<td>52.7 – 87.0</td>
</tr>
<tr>
<td>Body Mass Index (kg·m⁻²)</td>
<td>25.6</td>
<td>± 3.8</td>
<td>19.0 – 33.4</td>
</tr>
<tr>
<td>VO₂_peak (ml·kg⁻¹·min⁻¹)</td>
<td>40.4</td>
<td>± 8.3</td>
<td>29.0 – 58.0</td>
</tr>
<tr>
<td>Peak Power Output (watts)</td>
<td>225.3</td>
<td>± 42.0</td>
<td>152.0 – 321.0</td>
</tr>
</tbody>
</table>

Table 2. Correlation between heart rate and rating of perceived exertion.

<table>
<thead>
<tr>
<th>Time Point</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval 1</td>
<td>-0.33</td>
<td>0.21</td>
</tr>
<tr>
<td>Interval 5</td>
<td>-0.34</td>
<td>0.19</td>
</tr>
<tr>
<td>Interval 10</td>
<td>-0.07</td>
<td>0.80</td>
</tr>
<tr>
<td>Average</td>
<td>0.37</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Conclusions

Heart rate and RPE were not significantly related across the HIIT session.

Future research may be beneficial to investigate the use of heart rate and RPE to prescribe exercise intensity in long-term, real-world HIIT intervention studies.

References


Acknowledgements

The authors would like to thank the Department of Wellness and Movement Sciences for the use of the Jack R. Leighton Human Performance Laboratory during this project. We would also like to thank the American College of Sports Medicine Northwest chapter for the generous research grant which made this project possible.