Metabolic Equivalents of College-Aged Male Athletes
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Why?

• Metabolic Equivalent - Assumed
  • 3.5 ml O₂/kg/min
    • Value determined by 1 male, 40 yr old, 70 kg
• Byrne: 671 subjects, varying ages and genders
  • MET = 2.6 ml/kg/min

Due to conflicting results, the purpose of this study is to determine whether the accepted value of 3.5 ml O₂/kg/min is an acceptable MET value for male college athletes aged 18-25.

Descriptive Statistics

### Football Players N=10

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>Weight (kg)</th>
<th>BMI (kg/m²)</th>
<th>Body Fat %</th>
<th>Fat Mass (kg)</th>
<th>Lean Mass (kg)</th>
<th>VO₂ (ml/min)</th>
<th>MET (ml/kg/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>186.6</td>
<td>119.04</td>
<td>34.2</td>
<td>32.32</td>
<td>85.7</td>
<td>430</td>
<td>3.57</td>
</tr>
<tr>
<td>SD</td>
<td>2.63</td>
<td>8.79</td>
<td>2.58</td>
<td>7.25</td>
<td>6.72</td>
<td>60</td>
<td>0.46</td>
</tr>
<tr>
<td>Max</td>
<td>189.1</td>
<td>134.39</td>
<td>38.7</td>
<td>47.80</td>
<td>98.1</td>
<td>500</td>
<td>4.23</td>
</tr>
<tr>
<td>Min</td>
<td>182.0</td>
<td>104.31</td>
<td>30.9</td>
<td>20.44</td>
<td>75.1</td>
<td>300</td>
<td>2.53</td>
</tr>
</tbody>
</table>

### Cross Country Runners N = 10

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>Weight (kg)</th>
<th>BMI (kg/m²)</th>
<th>Body Fat %</th>
<th>Fat Mass (kg)</th>
<th>Lean Mass (kg)</th>
<th>VO₂ (ml/min)</th>
<th>MET (ml/kg/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>179.38</td>
<td>71.66</td>
<td>21.9</td>
<td>10.03</td>
<td>7.22</td>
<td>64.44</td>
<td>330</td>
</tr>
<tr>
<td>SD</td>
<td>5.46</td>
<td>9.03</td>
<td>2.05</td>
<td>2.12</td>
<td>2.00</td>
<td>7.96</td>
<td>100</td>
</tr>
<tr>
<td>Max</td>
<td>190.10</td>
<td>90.40</td>
<td>24.9</td>
<td>14.5</td>
<td>11.80</td>
<td>83.00</td>
<td>470</td>
</tr>
<tr>
<td>Min</td>
<td>170.87</td>
<td>60.36</td>
<td>18.6</td>
<td>6.50</td>
<td>4.00</td>
<td>54.20</td>
<td>160</td>
</tr>
</tbody>
</table>

Subjects and Methods

University of Dayton male athletes aged 18-25
• 10 Cross Country runners
  • BMI between 18.5 and 24.9 (Normal Range)
• 10 Football Linemen
  • BMI ≥ 30.0 (Obese Range)

• Height, Weight, BMI
• Body Composition via Bod Pod
  • HBD via Air Displacement
  • Siri Equation: 495/HBD – 450
• Percent Fat, Lean Body Mass, Fat Mass
• Resting Metabolism via Indirect Calorimetry
  • Parvo Medics TrueOne 2400
  • Mouth piece, head piece, nose clip, connecting tube
  • VO₂, VCO₂, Calories, RER
• Steady State Heart Rate for 5 Minutes
  • Polar Heart Rate Monitor

Findings

• “Accepted Value”: 3.5 ml/kg/min
• Byrne Value: 2.56 ml/kg/min
• Experimental Values:
  • Football: 3.57 ml/kg/min
  • Cross Country: 4.51 ml/kg/min
  • Total: 4.04 ml/kg/min
• Percent Differences
  • Football: 39.5% greater
  • Cross Country: 76.2% Greater
  • Total: 57.8% Greater

Reasons for Differences: Small sample size, age, heterogeneous vs. homogeneous group, BMI

Conclusion: Assumed MET value may not be accurate for all populations.