Aerobic capacity in young basketball players

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Introduction
Ball games require comprehensive ability including physical technical, mental, and tactical abilities (1). To evaluate physical abilities, parameters of the aerobic work capacity such as maximum oxygen uptake (VO2 max) are often used. Date of the physiological characteristics of the basketball players is mainly concentrated on adult athletes and little information is available on young players (2). Accordingly, the goal of this study was to determine the aerobic capacity of Serbian young basketball players and variations associated with sex.

Methods
Twelve members (age 16.0 ± 0.3) of the female basketball team and twelve members (age 16.1 ± 0.2) of the male basketball team volunteered to participate in this study. The height, body weight and HRmax were measured. We used standardized Nowacki treadmill protocol to determine maximal oxygen consumption (VO2max). The criteria for VO2max was a peak and plateau in oxygen consumption, RER>1.2, achievement of age predicted HRmax, and volitional exhaustion. The mean and standard deviation of each item of measurement were calculated in each group, and significance was assessed using Student's t test. p<0.05 was considered significant.

Results
Physical characteristics and values of young basketball players participating in this study are presented in Table 1.

Table 1. Physical characteristics of young basketball players

<table>
<thead>
<tr>
<th></th>
<th>Age (yrs.)</th>
<th>Height (cm)</th>
<th>Weight (kg)</th>
<th>HR max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>16.0 ± 0.3</td>
<td>172.3 ± 1.4</td>
<td>61.3 ± 1.5</td>
<td>193.4 ± 1.2</td>
</tr>
<tr>
<td>Boys</td>
<td>16.1 ± 0.2</td>
<td>192.5 ± 3.3</td>
<td>84.2 ± 3.7</td>
<td>193.7 ± 1.8</td>
</tr>
</tbody>
</table>

No statistical difference was found in HR max between young basketball players.
Mean VO2max values in girls and boys were 51.5 ± 0.9 ml kg⁻¹ min⁻¹ and 60.2 ± 1.4 ml kg⁻¹ min⁻¹, respectively. Statistically significant difference (p<0.01) was found in VO2max values between girls and boys (Figure 1).

![Figure 1. Maximum oxygen uptake in young basketball players](image)

Discussion/Conclusion
Despite the fact that level of training and number of training hours per week were similar for both groups, we found that young male basketball players had more than 30% higher VO2max values than females. A part of this difference is probably related to extra body fat carried by women and, to a lesser extent, to their lower maximal cardiac output and lower hemoglobin levels, which result in lower oxygen content in arterial blood.

References