ASSESSMENT OF ENERGY DEMAND IN LASER SAILING: INFLUENCES OF EXERCISE DURATION AND PERFORMANCE LEVEL.

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Introduction Apart from all technical, tactical and strategic consideration, the performance in dinghy sailing is directly related to the capacity of the sailor to overcome the external forces imposed on the boat. In Laser (single handed Olympic dinghy of 4.23 meters), the sailor has to carry out this work alone, which constitutes the principal cause of muscular fatigue (Vogiatzis et al., 1996). The aim of this study was to analyze the influence of both exercise duration and performance level on energy demand in laser sailing.

Methods: Twenty three subjects participated in this study. The population was split into two groups according their skill level (high vs. low). Every subject performed a 30-minute upwind sailing test, with a tack every two minutes. Three 4-minute intervals were analyzed: min 6-10 (T10), min 16-20 (T20) and, min 26-30 (T30). Heart rate, gas exchange and respiratory parameters were collected during the whole intervals and blood lactate concentration was measured at rest and immediately after the exercise completion.

Results: The major result was a significant increase in aerobic energy metabolism in the skilled group with sailing duration (up to 68, 35 % VO2 max.) whereas this demand remained stable and low in the other group (51,29 % VO2 max.)

Discussion/conclusions: Few work studied the importance of this request and to our knowledge never over a duration identical to that of the competition. The main result of this descriptive work is to show an increase with the time of the oxygen uptake during a 30 minutes navigation only at high skill level subjects. No obvious explanation can be advanced. While checking by electromyographic measurements in situation, in order to identify the frequency and the intensity of the movements in these two populations, and by analyzing the boat speed during a regatta thanks to installation of a GPS on the boat, it would be possible to see whether the metabolic evolution is related on the importance of the muscular request and the boat speed. We will be able to thus check the assumption that the increase deVO2 at high skill level subjects, is related to the capacity of maintenance of the hiking position, factor of performance in sailing.

Table 1: Variation of % VO2max, % H.R. max., % VE max function of exercise duration in the two population.

<table>
<thead>
<tr>
<th></th>
<th>T10</th>
<th>T20</th>
<th>T30</th>
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<tbody>
<tr>
<td>% VO2 max</td>
<td>45,08%</td>
<td>61,53% (+)</td>
<td>68,35% (+*)</td>
</tr>
<tr>
<td>% H.R. max</td>
<td>64,65%</td>
<td>73,46% (+)</td>
<td>78,53% (+*)</td>
</tr>
<tr>
<td>% VE max</td>
<td>33,05%</td>
<td>43,301% (+)</td>
<td>46,51% (+)</td>
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</tbody>
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Fig. 1: de % VO2max variation correlated with test duration (T10,T20,T30) in the tow groups (experts – non-experts)

* if significative différence between the two populations, p<0,05
+ if significative différence with previous period (in H.S.), p<0,05
Références


