

Abstract

Physiological and Race Pace Characteristics of Medium and Low-Level Athens Marathon Runners †

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† Presented at the 9th Greek Conference of Biochemistry and Physiology of Exercise, Thessaloniki, Greece, 18–20 October 2019.

Published: 2 September 2019

Abstract: **Aim:** Maximum oxygen uptake (VO_{2max}), running economy, and lactate threshold (LT) velocity are interacting factors which determine the running speed that that can be sustained in an endurance event such as Athens marathon. The aim of this study was to examine the physiological characteristics and the race pace characteristics in relation to the aforementioned parameters of moderate (finish time < 240 min) and low-level runners (finish time > 240 min) of the Athens marathon race. **Material & Method:** 15 athletes (age, 41 ± 7 yrs; height, 174.5 ± 6.6 cm; and body mass, 72.8 ± 6.9 kg), who participated in the 2018 Athens marathon, performed an incremental test until exhaustion, 3 to 10 days before the race to determine VO_{2max} , maximal aerobic velocity (MAV), and the velocity at the 1st LT. The athletes were divided into a moderate level ($n = 8$, finish time, 209.0 ± 10.4 min) and a low-level group ($n = 7$; finish time, 289.7 ± 25.1 min). Finish time was exported from the results posted on the official site of the organization. **Results:** For the whole sample, VO_{2max} was 52.4 ± 5.2 mL/kg/min, MAV 15.5 ± 1.4 km/h, and velocity at the 1st LT 10.6 ± 1.4 km/h, corresponding to $68.0 \pm 5.4\%$ of MAV and to $75.0 \pm 8.8\%$ of VO_{2max} . The mean finish time was 246.7 ± 45.4 min, and the average running velocity 10.6 ± 1.9 km/h, which corresponded to $99.9 \pm 7.5\%$ of the velocity at the 1st LT and $75.0 \pm 8.8\%$ of VO_{2max} . Moderate level, compared with the low-level athletes had higher ($p < 0.05$) VO_{2max} (55.5 ± 3.5 vs. 48.8 ± 4.8 mL/kg/min), MAV (16.5 ± 0.7 vs. 14.4 ± 1.2 km/h), and velocity at 1st LT (11.6 ± 0.8 vs. 9.4 ± 1.0 km/h, corresponding to 70.5 ± 4.0 vs. $65.2 \pm 5.6\%$ of MAV). Medium-level athletes ran the marathon at a higher velocity (12.1 ± 0.6 vs. 8.8 ± 0.9 km/h), corresponding to a higher percentage of MAV (73.8 ± 2.6 vs. $61.3 \pm 4.2\%$), 1st LT (104.8 ± 4.8 vs. $94.2 \pm 5.8\%$), and VO_{2max} (80.0 ± 7.8 vs. $69.3 \pm 6.5\%$). **Conclusions:** These findings suggest that athletes of different levels run the Athens marathon at a rate corresponding to different percentages of key parameters of aerobic performance. It is recommended that the selected pace be applied individually according to each athlete's level.

Keywords: marathon runners; maximal aerobic velocity; VO_{2max}



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