



Physiological demands of dance: A study of competitive DIII collegiate dancers

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Introduction

- There is a dearth of research regarding the physical demands of a competitive, DIII collegiate dance team performance.
- A thorough understanding of the sport or activity is important in designing safe and effective exercise programs to enhance performance.¹

Purpose

- The purpose of this study was to better understand the physiological demands of a collegiate dance team performance and inform evidence based exercise program design for dancers.

Methods

- Fourteen Division II female dance team members volunteered for the study.
- The subjects consumed a standardized meal of approximately 80 g of carbohydrate two hours prior to testing.
- The subjects' urine was tested using Accutest URS Hydration Strips to ensure normal hydration (specific gravity ≤ 1.020).
- To identify each subject's anaerobic lactate threshold, a graded treadmill test was performed with blood lactate testing every three minutes.
- Following the graded treadmill test, a recovery period was provided to allow the subjects' blood lactate concentrations to return to baseline.
- The dance test protocol was conducted in the College of St. Benedict aerobics studio and consisted of performing four progressively longer segments of the dancers' two minute competitive jazz dance routine (0 to 30 s, 0 to 60 s, 0 to 90 s, and 0 to 120 s).
- Subjects rested between dance segments until BLA concentrations returned to baseline.
- HR, BLA, and RPE were assessed immediately upon completion of each dance segment.
- Percent maximum HR was calculated by dividing recorded HR by the subject's estimated HR maximum (220 - age).
- A descriptive analysis was used to characterize the subjects' physiological response to the dance routine performance.

Results

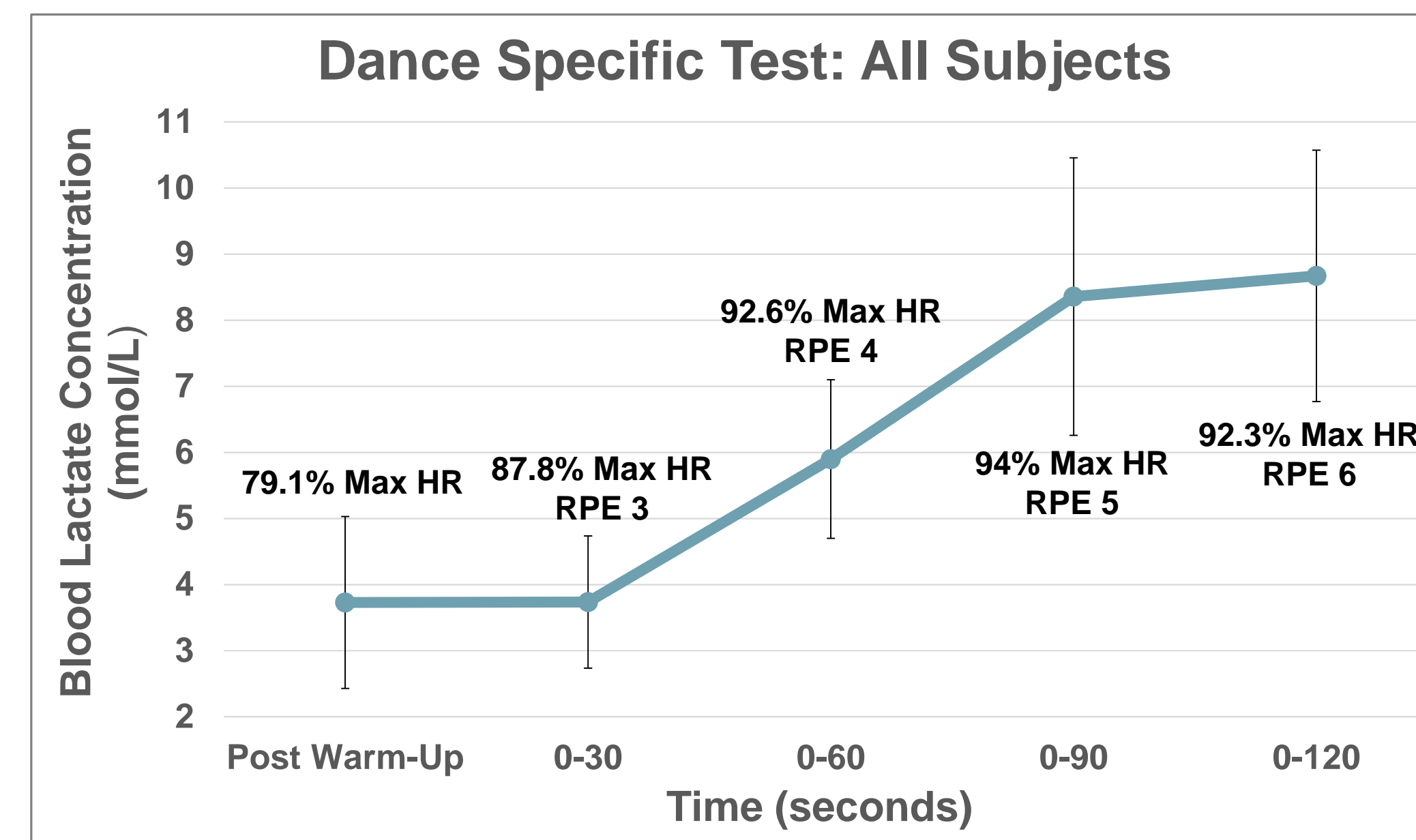


Figure 1. Mean BLA concentration, % HRmax, and RPE immediately following each dance segment.

- Six subjects reached anaerobic lactate threshold by 60 s and all subjects had exceeded lactate threshold by 90 s into the dance routine.
- All subjects reached lactate threshold by 90 s and remained above threshold for the remainder of the dance.
- Dancers maintained HRs in excess of 90% of their maximum HR for more than half the dance.

Discussion

- The slight decrease in HR from the 0-90 s interval to the 0-120 s interval could be a result of lower intensity choreography at the end of the dance.
- Competitive collegiate dance is primarily an anaerobic activity; which is important information in designing an exercise program to optimize performance and minimize overuse injuries.
- Mean RPE at the end of the 0-120 s segment was 6 on the CR-10 scale, which is believed to represent an exercise intensity just prior to or at anaerobic lactate threshold.²



Future Research

- Future research should assess the biomechanical qualities of dance, such as mechanical work and power to further inform exercise program design for dancers.

Conclusion

- The rapid rise in BLA above anaerobic lactate threshold indicates that competitive collegiate dance is a highly anaerobic activity.
- Exercise programs designed for dancers should emphasize development of the anaerobic energy systems and enhance blood lactate clearance.

Literature Cited

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