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Prediction of maximal heart rate percent during constant intensity efforts on trained subjects

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ABSTRACT

The purpose of this study is to evaluate the relationship between %HRmax and %vVO2max at constant efforts made at different intensities. In randomized order, males healthy subjects (Age: 25 ± 7 years, Weight: 70 ± 11 kg, VO2max: 55 ± 8 ml · kg^{-1} · min^{-1}) were divided into two groups, a trained one with more than 3 training sessions per week (n = 10) a moderately trained one with 3 drives or less per week (n = 15). The difference between the two groups corresponds to a time to exhaustion above and below 40 min at 80% vVO$_2$max. All subjects performed 5 tests with a gradual increase in speed of 1 km · h^{-1} every 2 min and 4 constant speed tests at 60%, 70%, 80% and 90% VO$_2$max. All test were performed at the same time of day (*i.e.*, 18:00 h). The results of this study showed that eighteen collective regressions including different independent variables were developed to predict %HRmax. The individual equations developed, have r values between 0.974 and 0.993 and Syx, between 1.2 and 1.9 ml · kg^{-1} · min^{-1}, they are more accurate than the collective equations (one equation for all subjects) with r values between 0.81 to 0.89 and Syx, between 4.1 and 5.3 ml · kg^{-1} · min^{-1}. In conclusion, this study has demonstrated that the model of predictions of %HRmax from %vVO$_2$max in triangular tests were not appropriate for rectangular efforts. From the equations developed, we find that the time to exhaustion at 90% vVO$_2$max is the best predictor of level of endurance then the time limit to 80% vVO$_2$max.

KEYWORDS

Heart Rate Percent; Treadmill Exercise; Prediction; Triangular Test

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