The profile of heart rate training zones in non-elite rower across a winter training phase

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Introduction:

• The use of heart rate zones (HRZ) to add quality to training is now common practice in endurance athletes.

• HRZ may be determined from interpolated heart rate (HR) blood lactate (BLa) relationships in laboratory based fitness tests.

• The aim of this study was to profile typical HRZ derived from laboratory based exercise testing in non-elite rowers throughout a winter training phase.

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Methods:

• 18 senior male rowers performed GXT in early (GXT1), middle (GXT2) and late (GXT3) winter training phase.

• Individual aerobic HRZ interpolated at BLa:
  • <1 mmol.L\(^{-1}\); HRZ A1, easy active recovery
  • 1.0-1.5 mmol.L\(^{-1}\); HRZ A2, aerobic conditioning
  • 2.0-3.0 mmol.L\(^{-1}\); HRZ A3, high aerobic intensity

• Curve fitting procedures were performed on individual HR and BLa responses to incremental exercise.

• Analysis of variance (ANOVA) and post-hoc analysis (Tukey) allowed for detection and quantification of changes in mean HRZ across the training phase.
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Results:

- Significant effect of time on mean HRZ ($P < 0.05$)
- *Post-hoc:* Significant change in mean HRZ A1, A2, A3 between GXT1 & GXT2; and in HRZ A1 and A2 between GXT2 & GXT3.
- No significant change in HRZ between GXT1 & GXT3.

$m =$ moderate effect size, $s =$ small effect size (Cohen’s $d$)

$# P < 0.05$ significant effect of time on mean HRZ

$* P < 0.05, ** P < 0.005, *** P < 0.0005,$ significant difference between GXT
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Discussion:

• Aerobic metabolism supplies 75-80% of the energy demands for a 2000-m rowing race (Nilsen et al. 2002). Therefore training should emphasise aerobic intensities.

• HR is a preferred mode of exercise intensity prescriptions (Achten & Jeukendrup, 2003) and a reliable measure of such intensities in endurance sports (Becque et al. 1993).

• Shifts in metabolic and HR responses of non-elite rowers showed significant variation over a winter training phase.

• This suggests the need for serial modification of HRZ training prescriptions throughout winter training phase in non-elite cohorts.