

Impact of Polarized Versus Threshold Training on Fat Metabolism and Neuromuscular Variables in Ultrarunners

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Abstract

Author Notes

Purpose: To compare the effects of 2 different intensity distribution training programs (threshold [THR] and polarized [POL]) on fat metabolism and neuromuscular variables. **Methods:** Twenty ultrarunners were allocated to POL ($n = 11$; age 40.6 [9.7] y, weight 73.5 [10.8] kg, VO_2max 55.8 [4.9] $\text{mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) or THR group ($n = 9$; age 36.8 [9.2] y, weight 75.5 [10.4] kg, VO_2max 57.1 [5.2] $\text{mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) and performed a 12-week training program that consisted of 5 running sessions, 2 strength sessions, and 1 day of full rest per week. Both groups performed similar total training duration and load but with different intensity distribution during running sessions. Resting metabolic rate, fat metabolism, isometric rate of force development (RFD; $\text{N}\cdot\text{s}^{-1}$) and maximal voluntary contraction in the knee extensor, and electromyographic amplitude were measured before and after each program. **Results:** A significant decrease in $\text{RFD}_{0-100\text{ ms}}$ ($\Delta -13.4\%$; $P \leq .001$; effect size [ES] = 1.00), $\text{RFD}_{0-200\text{ ms}}$ ($\Delta -11.7\%$; $P \leq .001$; ES = 1.4), and RFD_{peak} ($\Delta -18\%$; $P \leq .001$; ES = 1.4) were observed in the POL group. In THR group, a significant increase in mean electromyographic amplitude ($\Delta 24.4\%$; $P = .02$; ES = 1.4) was observed. There were no significant differences between groups in any of the variables. **Conclusions:** Similar adaptations in fat metabolism and neuromuscular performance can be achieved after 12 weeks of POL or THR intensity distribution. However, THR distribution appears to better maintain strength (RFD) and improve mean electromyographic amplitude. Nevertheless, the combination of both running and maximum strength training could influence on results because of the residual fatigue thus inducing suboptimal adaptations in the POL group.