IMMUNOLOGICAL RESPONSE TO A TRAINING MICROCYCLE FOLLOWING SHORT TERM DETRAINING IN MALE COLLEGIATE ROWERS.


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Moderate physical activity has been shown to enhance the action of the immune system, whereas repeated studies have shown intense exercise to have an inhibitory effect (Hoffmann-Goetz and Pedersen, 1994). The aim of the present study was to investigate the short term immunological response to a controlled training microcycle.

Eight male collegiate rowers in early season training (age 20.0±0.7 yr, mass 79.8 ± 3.5 kg, % body fat 11.9±1.0%, rowing experience 3.5±0.6 yr, mean±SE) underwent incremental testing (Concept He rowing ergometer, initial load 160W, increment 40 W, duration 3 min) to determine VO2 max, cardiovascular and blood lactate response to exercise. Individual load at lactate threshold (\(T_{1ac}\)) was determined graphically. Mean±SE load at \(T_{1ac}\) and VO2 max were 235.8±14.3W and 5.25±0.14 L·min⁻¹, all subjects subsequently trained at intensities based on their individual \(T_{1ac}\). Non-randomised, supervised weekly training schedule was steady state (S); 3 by 30 min at \(T_{1ac}\) easy (E); 3 by 42-45 min at \(T_{1ac}+20\%\), intermittent high intensity (H); 3 by set of 8 repetitions of 3 min at \(T_{1ac}+20\%\), 2 min at \(T_{1ac}-20\%). Individual training duration in E and H were modified to equate to total work done in S, on alternate days all subjects undertook 60 min at \(T_{1ac}-30\%\). Blood samples for immunological assay were collected pre, at 1 and 2h post the final supervised training session in each weekly phase of the microcycle. T cell subset and lymphocyte counts were measured using a Becton Dickinson FACS Calibur flow cytometer and multiSET software, immunoglobulin assays (IgG, IgA and IgM) were performed using a Behring Nephelometer analyser. Individual post exercise values were expressed as a % of pre exercise values for T cells (CD3+), NK cells (CD16+,CD56+) and total lymphocyte (CD45+). All data were analysed using ANOVA for repeated measures and post-hoc analysis of significant differences (P<0.05) were carried out using Scheffe F test.

All pre exercise values were in the normal range and did not differ significantly across the microcycle. Immunoglobulin fractions IgG, IgA and IgM showed no significant differences at 1 and 2h post exercise at any training intensity. NK cells were significantly reduced post exercise (mean reductions were 75 and 59% for S; 67 and 49% for E; 71 and 56% for H at 1 and 2h respectively). T cells were significantly reduced at 1 and 2h post S (16 and 23%) and at 1h post H (12%); no significant reductions were observed following E. Total lymphocyte counts were significantly reduced at 1 and 2h post S and H, and 1h post E (mean reductions were 26 and 28% for S; 20 and 15% for H; 13% for E respectively).

The biggest reductions in NK cell, T cell and total lymphocyte count occurred during the S and H elements of the microcycle. The lower intensity week E showed the least effect on any of the parameters measured. Alternating active recovery days (1h at \(T_{1ac}-30\%\)) and exercise duration limited to <1h during supervised training sessions in S, E and H prevented any cumulative reduction in counts over each individual week and over the entire microcycle.

REFERENCES

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