

HIT vs. LSD: Four days of intensive training does not influence lactoferrin, but LSD increases resting IL-6 while attenuating the acute exercise response, yet HIT elevates salivary cortisol levels.

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ABSTRACT

High intensity training programs (HIT) induce comparable endurance performance adaptations to those of continuous long slow distance training (LSD). HIT has increased, as athletes are able to maintain their VO₂ max or performance with less time, and reduced training volume. High training volume may be immunosuppressive. **PURPOSE:** To examine a major mucosal immune component (salivary lactoferrin), the circulating cytokines (IL-6, IL-8, TNF-α), and cortisol response to HIT and LSD during 4 days of intensified training (IT). **METHODS:** Eight endurance-trained males (23.1±2.0yr, VO₂ max 53.9±5.3 ml·kg⁻¹·min⁻¹) performed two, 4-day IT protocols: HIT and LSD conditions (separated by ≥ 21 days). Both conditions included 2 exercise sessions / day (morning (AM) and late afternoon (PM)). LSD consisted of 50 min cycle ergometry in the AM (70% VO₂max) and 90 min running in the PM (70% VO₂max). The AM HIT session included 8 all-out, 30 sec cycling sprints (resistance=0.075kg·kg⁻¹ body mass) with 4.5-8.5 min active recovery. The PM HIT session was the same as that for LSD. Blood and saliva samples were obtained at various time points based on the dependent variable. Plasma cytokines and creatine kinase (CK) activity were assessed both before and after the AM exercise sessions (pre-(PR), post(PO)-exercise) in both conditions on the first (before training; BT) and fourth (after training; AT) day of IT. Creatine kinase activity and cytokines were assessed in plasma. Salivary lactoferrin, and cortisol were assessed at 3 time points on days 1, 2 and 4 (PR and PO for AM, and PR for PM) in UHIT and LSD. Additionally, saliva was also collected at one time point (PR for the AM session) on the third and fifth day. **RESULTS:**

Figure 1. HIT vs. LSD- IL-6 and CK activity					
Time Point	BT PRE	BT PO	AT PRE	AT PO	12-16HR PO
HIT	^a 3.6, ¹ 532.7	^a 6.2, ¹ 440.4	^{b,f} 4.5, ^{3,5} 76.0,	^{b,e} 6.5, ^{3,4} 86.8	3.1, 54.9
LSD	^c 3.2, ² 34.3	^c 5.2, ^{2,7} 44.2	^d 5.7, ⁶ 78.1	^{d,e} 4.0, ^{6,7,8} 75.7	3.7, 70.3

Values above are listed as IL-6 (pg•mL⁻¹), CK (U/L). BT= Day 1, AT= Day 4. Same letters indicate differences between time points for IL-6 serum levels (p<0.05). Same numbers indicate differences between time points for CK activity (p<0.05). Additionally, a significant time x day interaction occurred for lactoferrin secretion rate (PO>PR on days 1 and 4, 1735>5639 and 2290>5663 ng•min⁻¹, respectively; p=0.032). Moreover, a significant condition x time interaction occurred for lactoferrin secretion rate (p=0.047). A main effect for condition revealed that salivary cortisol was greater in HIT vs. LSD (p=0.028). **CONCLUSION:** Four days of IT did not attenuate the lactoferrin response to acute exercises. LSD resulted in elevated resting IL-6, which may be responsible for the attenuation of the IL-6 response to acute exercise in this condition due to a feedback inhibition mechanism. Cortisol response is frequently linked to that of Il-6. Il-6 response to acute exercise was maintained in HIT, which may explain the elevated cortisol levels.