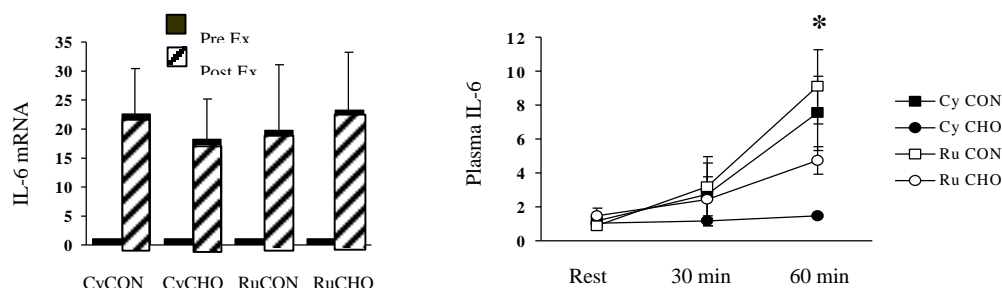


EFFECT OF MODE OF EXERCISE AND CHO INGESTION ON IL-6 GENE EXPRESSION IN HUMAN SKELETAL MUSCLE

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Exercise increases plasma concentrations of the pro-inflammatory cytokine interleukin (IL)-6. It has been demonstrated that this increase is augmented when comparing running with cycling exercise and blunted by carbohydrate (CHO) ingestion, irrespective of exercise mode (Nieman *et al.*, 1998). Although it has been hypothesised that monocytes are the source of the rise in plasma IL-6, we have demonstrated that neither exercise nor CHO ingestion affects monocyte intracellular IL-6 production (Starkie *et al.*, 2000). In addition, IL-6 mRNA is elevated in skeletal muscle after exercise, suggesting that contracting muscle is a probable source of the exercise induced increase in IL-6 (Ostrowski *et al.*, 1998). Hence, the aim of the present study was to examine the effect of mode of exercise and CHO ingestion on IL-6 gene expression in human skeletal muscle.

Seven moderately trained men (31 ± 2 yrs, 83.2 ± 3.7 kg, VO_2 peak = 4.39 ± 0.23 l min⁻¹, mean \pm SD) completed four randomised exercise trials for one hour at a workload corresponding to each individuals lactate threshold. Two trials were conducted on a bicycle ergometer (Cy) and two on a running treadmill (Ru) either with (CHO) or without (CON) the ingestion of a CHO beverage throughout the exercise. Muscle biopsies were obtained before and immediately after exercise in all trials and these samples were measured for IL-6 gene expression using real time PCR. In addition, blood samples were collected at rest, 30 min during and at the cessation of exercise, which were analysed for plasma IL-6. Exercise resulted in a 21 ± 4 fold increase in IL-6 mRNA expression. However, this increase was not affected by either mode of exercise or CHO ingestion (see Figure). In contrast, whilst mode did not influence plasma IL-6 concentration, CHO ingestion blunted the plasma cytokine response ($P < 0.01$ for beverage x time interaction) (see Figure).



These data demonstrate that CHO ingestion attenuates plasma IL-6 concentration during both cycling and running exercise. However, since IL-6 gene expression was unaffected by CHO ingestion it is probable that the ingestion of CHO attenuates IL-6 production by other tissues.

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