

The Impact of Immobilisation and Trauma/Inflammation on Muscle Mass and Insulin Resistance in Humans

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Bed rest (BR) of only a few days duration reduces muscle protein synthesis and induces skeletal muscle atrophy and insulin resistance, but the scale and juxtaposition of these events have not been investigated concurrently in the same individuals. Furthermore, the concurrent impact of short-term exercise-supplemented remobilisation following BR on muscle volume, protein turnover and insulin-stimulated glucose uptake in humans is relatively unknown, but nevertheless is of clinical importance. Muscle metabolic adaptation in the transition from acute (days) to chronic (weeks/months) BR and the mechanisms involved is also somewhat unresolved, and particularly under conditions where volunteers have been maintained in energy balance to minimise the confounding impact of excess energy intake on metabolic adaptation to BR. This presentation will therefore focus on these knowledge gaps, and will also consider the cumulative impact of combined immobilisation and trauma related burden on muscle metabolic regulation in human volunteers. The talk will highlight that whilst muscle mass loss and insulin resistance are common end-points of BR and increased trauma related burden in humans, a gap in understanding of the pathophysiological mechanisms involved in each scenario exists.