Immune and acute phase markers in exercising adults

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Many reports have documented the anti-inflammatory effects of regular exercise in adults. However clinicians and researchers remain uncertain on selecting specific biomarkers that are useful for predicting or monitoring chronic inflammatory states and/or disease. Clearer identification of markers (or clusters of markers) in physically active individuals that vary from established references ranges will indicate the extent of the purported anti-inflammatory effect of regular exercise.

Physically active adults were recruited from the community to participate in a prospective study comparing self-reported health outcomes and exercise activity across 150 days of dietary intervention. Of the 450 participants recruited, 64 males (mean age 37.4 y, mean BMI = 25.3) and 59 females (mean age 40.4y, mean BMI= 23.4) agreed to supply a baseline blood sample taken at rest. A total of 187 analytes were measured by standard techniques on these pre-intervention samples including 11 immune markers (cell-types and immunoglobulins) and 11 acute phase reactants (WCC, albumin, haptoglobin, CRP, C3, C4, IGF-1, transferrin, iron, ferritin & ceruloplasmin). We compared baseline values with relevent hospital reference range (RR) values where these are assumed to be more reflective of a much less physically-active community population.

A total of 5 out of 11 of the acute phase reactants (Hapt, C3, Fer, Trf (for females), and ceruloplasmin (for males)) had >10% of values below the low 'cut-off end' of the relevant RR. Three immune cell-types (CD19, CD8 & CD16/56) had >10% of values below the 'low-cut-off end' of the relevant RR. In contrast 25% of subjects had an IgE value that exceeded the RR. Collectively our results support the notion that regular exercise or physical activity exerts an anti-inflammatory affect. The results suggest putative roles for a host of exercise associated adaptive mechanisms beyond the generally accepted role for IL-6 derived from skeletal muscle and\or visceral fat.

We conclude that across a host of measures, exercising adults have values for immune and acute phase reactants largely within, but at the non-inflammatory 'end' of clinical reference ranges.