THE IMPACT OF MARATHON RUNNING UPON CARDIAC BIOMARKERS
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Purpose: Cardiac biomarkers such as cardiac troponin T (cTnT), Ischemia Modified Albumin (IMA) and N-terminal B type natriuretic peptide (NT-BNP) are increasingly important in the diagnosis and management of acute coronary syndromes. A number of non-pathologic stimuli including exercise acutely influence circulating cardiac biomarkers. The purpose of this paper was to examine the influence of marathon running upon cardiac biomarkers.

Methods: Following ethical approval 106 competitors (age: 34 ± 9 years, completion time: 243 ± 49 min) from the London Marathon (2001-2005) provided written informed consent to take part. Venous blood samples (5ml) were drawn pre and immediately post completion of the race. Serum samples were analysed for IMA (Ischemia Technologies, USA) (n=99), NT-BNP (Roche Diagnostics, UK) (n=55) and cTnT (Roche Diagnostics, UK) (n=101). Pre-post IMA and NT-BNP data were analysed using paired sample T-tests. Due to the likelihood of negative cTnT in baseline samples cTnT data were analysed descriptively reporting the number of samples above the detection limit of the assay, and above the cut off for myocardial infarction (MI) (0.05µg/L). Relationships between pre-post cardiac biomarkers, race completion time and age were analysed using Pearson’s correlation. Alpha was set at 0.05.

Results: IMA was significantly reduced following completion of the marathon (89.1 ± 15.2 vs. 81.3 ± 19.4 KU/L), whilst BNP was significantly elevated (33.2 ± 21.1 vs. 107.3 ± 138.4 µg/L) with 20 athletes above the 100µg/L clinical cut off. Cardiac troponin T was elevated above the detection limit of the assay in 80 athletes and above the 0.05µg/L MI cut off in 36 athletes. No significant correlation between changes in cardiac biomarkers and either age or completion time was observed.

Discussion and Conclusions: The reduction in IMA observed following completion of the marathon might be related to an exercise induced increase in circulating albumin or elevations in blood lactate. Marathon running results in clinically and statistically significant elevations in cardiac biomarkers, clinicians should be aware of exercise induced perturbations in cardiac biomarkers so as to avoid the potential mismanagement of athletes following endurance exercise.

Keywords: Endurance Performance, Muscle Damage