Abstract: P580

The influence of endurance races on copeptin and pregnancy plasma protein A

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Introduction: Copeptin (Cop) and pregnancy plasma protein A (PAPP-A) are emerging but unspecific diagnostic cardiac markers, which are released very early during cardiac stress. The primary objective of this study was to investigate the differences in release of these markers in athletes after ultra-marathon and marathon in comparison to the specific sensitive cardiac troponin I (sc-TnI).

Methods: This was an observational, cross-over study including subjects performing an ultra-marathon (UM, 130 km) and marathon (M, 42.195 km) 6 months apart. Blood samples were taken before and immediately after the races. Cop and PAPP-A were measured, using the ultrasensitive KRYPTOR compact PLUS (B.R.A.H.M.S. GmbH, Thermo Scientific), sc-TnI was measured by use of Flex reagent cartridge (Dimension Vista 1500, SIEMENS).

Results: We included 15 experienced non-professional athletes (mean age 42.9 ± 8 years). When comparing baseline and post-race levels, we observed significant higher values for Cop after M (baseline median 3.8 [IQR, 2.9 – 7.3] pmol/L vs. post-race 26.3 [IQR, 16.3 – 39.0] pmol/L; p<0.001) and UM (baseline median 4.1 [IQR, 2.4 – 5.6] pmol/L vs. post-race 9.8 [IQR, 6.6 – 39.4] pmol/L; p<0.001), respectively. We also observed an increase after both races for sc-TnI (baseline median UM and M 0.015 [IQR 0.015 – 0.015] µg/L vs. post-race marathon 0.28 [IQR 0.015 – 0.049] µg/L and vs. post-race UM 0.56 [IQR 0.022 – 0.104] µg/L; p=0.003 and p=0.001). Regarding PAPP-A there was a significant elevation after the M (baseline median 7.3 [IQR, 6.4 -9.0] mU/L vs. post-race 9.7 [IQR, 8.2 – 11.8] mU/L; p=0.001), but not after the UM (baseline median 8.3 [IQR, 7.7 – 8.8] mU/L vs. post-race 9.0 [IQR, 8.0 – 9.8] mU/L; p=0.223). When comparing post-race levels after UM and M we detected significant higher values for Copeptin after M compared to UM (p=0.039) but no significance for PAPP-A (p=0.099) and sc-TnI (p=0.089).

Conclusion: In our hands the type of race has significant influence on unspecific and specific cardiac markers, with higher values after M compared to UM for Cop and PAPP-A, but vice versa elevated sc-TnI levels after UM. A potential explanation might be that M running reflects a higher physical stress for a shorter duration with an impact on unspecific markers, while a chronic prolonged mismatch between oxygen consumption and supply as in UM explains the higher increase in sc-TnI.