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Sport Sciences for Health

Volume 15, Issue 3, 1 December 2019, Pages 585-593

## Neutrophil - to - lymphocyte ratio and exercise intensity are associated with cardiac - troponin levels after prolonged cycling : the Indonesian North Coast and Tour de Borobudur 2017 Troponin Study (Article)

Azam, M.<sup>a</sup> ✉, Setyaningsih, E.<sup>a</sup>, Rahayu, S.R.<sup>a</sup>, Fibriana, A.I.<sup>a</sup>, Setianto, B.<sup>b</sup>, Widyastiti, N.S.<sup>c</sup>, **Suhartono, S.<sup>d</sup>**, Susanto, H.<sup>e</sup>, Kartasurya, M.I.<sup>f</sup>, Bahrudin, U.<sup>g</sup>, Eijsvogels, T.M.H.<sup>h</sup> 🔍

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### Abstract

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**Purpose:** The mechanism of cardiac - troponin elevation after exercise remains unclear. Studies have reported that leucocyte ratios are related to coronary artery disease. The present study explored the relationship between leucocyte ratios, exercise intensity, and post- exercise cardiac - troponin I (cTnI) levels. **Methods:** Ninety-two participants in a long-distance cycling tour were included in this study. Baseline and post- exercise blood samples were collected to determine cTnI concentrations. Biochemical parameters and leucocyte ratios were measured at baseline. Exercise intensity was examined by recording the heart rate (HR). Exercise intensity was determined as the percentage of peak HR to maximal predicted HR. Based on clinical cutoff points of the cTnI assay, cTnI levels were defined as < 10 ng/mL and ≥ 10 ng/mL. **Results:** Eighty-eight participants completed the cycling tour after a median time of 7.3 h, at a median intensity of 81.8% of maximal HR. cTnI concentrations increased from 5.2 ± 9.83 ng/mL at baseline to 13.6 ± 36.12 ng/mL post- exercise, with 31.8% of the study population having cTnI ≥ 10 ng/mL. Neutrophil count, lymphocyte count, neutrophil - to - lymphocyte ratio (NLR), monocyte- to - lymphocyte ratio, recovery HR, mean and peak HR, and exercise intensity were associated with post- exercise cTnI levels in bivariate analysis. After adjustment for potential confounders, only NLR and exercise intensity were significantly related to post- exercise cTnI levels in the multivariable model. **Conclusions:** NLR and exercise intensity are significantly associated with post- exercise cTnI levels, suggesting that inflammatory factors may play a role in the magnitude of exercise -induced cTnI release beyond exercise intensity. © 2019, Springer-Verlag Italia S.r.l., part of Springer Nature.

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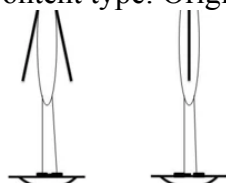
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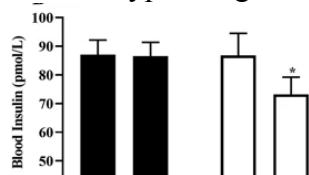


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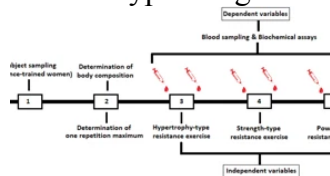


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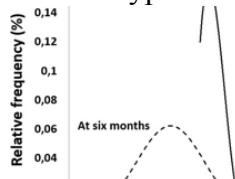


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