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Volume 11, Issue 1, 2019, Pages 91-99

Baseline and post-exercise high-sensitivity c-reactive protein levels in endurance cyclists: The Indonesian North Coast and Tour de Borobudur 2017 study (Article) [\(Open Access\)](#)

Azam, M.^{a,b}, Lestari, S.^a, Rahayu, S.R.^a, Fibriana, A.I.^a, Setianto, B.^c, Widyastiti, N.S.^d, **Suhartono^e**, Susanto, H.^f, Kartasurya, M.I.^g, Bahrudin, U.^h, Eijsvogels, T.ⁱ

^aDepartment of Public Health, Faculty of Sport Sciences, Universitas Negeri Semarang, Jl. Sekaran, Gunungpati, Semarang, Indonesia

^bMedicine and Health Sciences, Faculty of Medicine, Universitas Diponegoro, Jl. Imam Bardjo SH No. 5, Semarang, Indonesia

^cDepartment of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Indonesia, Jl. Letjen S. Parman Kav 87, Slipi, Jakarta, Indonesia

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Abstract

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BACKGROUND: Inflammation plays an important role in the atherosclerotic process. High-sensitivity C-reactive-protein (hs-CRP) is commonly used as inflammatory biomarker. It is well known that regular physical activity lowers hs-CRP levels, while prolonged exercise induces hs-CRP elevations. However, the relationship of training and exercise characteristics with hs-CRP levels remains not well elucidated. We evaluated baseline and post-exercise hs-CRP levels and its association with training and exercise characteristics. **METHODS:** Eighty-eight male endurance cyclists were involved. Demographic data, health condition and training characteristics were collected. Baseline and postexercise blood-samples were collected to determine hs-CRP concentrations. A hs-CRP cut-off point of 3 mg/L was used. Blood-cell count and biochemical parameters were measured at baseline. Heart rate (HR) was measured during exercise. **RESULTS:** Cyclists performed 7.3 hours (interquartilerange (IQR) = 5.4-7.5) of endurance exercise at intensity of 81.8 % (IQR = 74.9-85.8). Cyclists with baseline hs-CRP ≥ 3 mg/L reported higher body mass, body mass index (BMI), waist-circumference and total-cholesterol. An increase in hs-CRP was following endurance exercise. Cyclists with any elevation of hs-CRP reported a higher BMI, HR during exercise and exercise intensity. Binary logistic regression analysis showed BMI (OR = 1.24, 95% CI = 1.04-1.48) and cycling distance (OR = 0.22, 95% CI = 0.06-0.76) were associated with post-exercise hs-CRP elevations. **CONCLUSION:** Body mass, BMI, waist-circumference, total- and HDL-cholesterol are associated with baseline hs-CRP, whereas BMI and cycling distance were associated with hs-CRP elevations. These findings suggest that anthropometry parameters and lipid levels attributed to baseline hs-CRP, while anthropometry parameters and cycling intensity attributed to post-exercise hs-CRP elevations. © 2019 Prodia Education and Research Institute.

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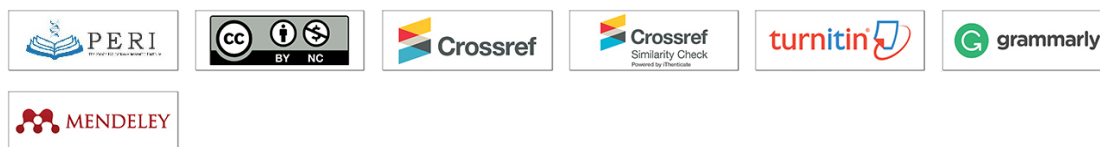
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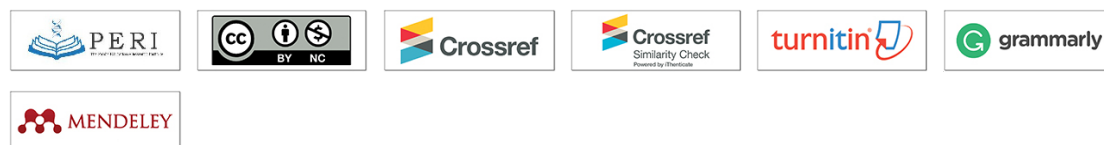
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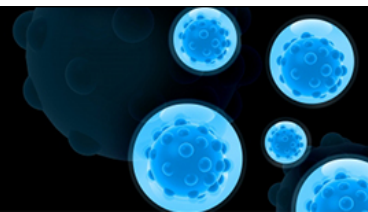
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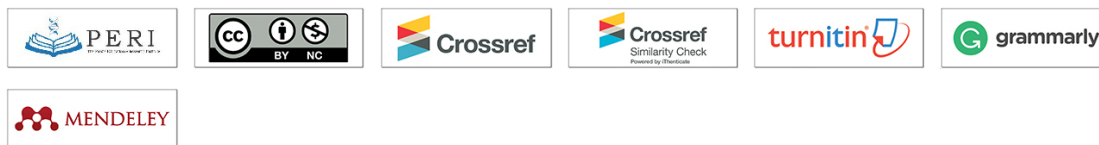
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Baseline and Post-exercise High-Sensitivity C-Reactive Protein Levels in Endurance Cyclists: The Indonesian North Coast and Tour de Borobudur 2017 Study

Mahalul Azam, Susanti Lestari, Sri Ratna Rahayu, Arulita Ika Fibriana, Budhi Setianto, Nyoman Suci Widyastiti, [Suhartono Suhartono](#), Hardhono Susanto, Martha Irene Kartasurya, Udin Bahrudin, Thijs Eijvogels

Abstract

BACKGROUND: Inflammation plays an important role in the atherosclerotic process. High-sensitivity C-reactive-protein (hs-CRP) is commonly used as inflammatory biomarker. It is well known that regular physical activity lowers hs-CRP levels, while prolonged exercise induces hs-CRP elevations. However, the relationship of training and exercise characteristics with hs-CRP levels remains not well elucidated. We evaluated baseline and post-exercise hs-CRP levels and its association with training and exercise characteristics.

METHODS: Eighty-eight male endurance cyclists were involved. Demographic data, health condition and training characteristics were collected. Baseline and postexercise blood-samples were collected to determine hsCRP concentrations. A hs-CRP cut-off point of 3 mg/L was used. Blood-cell count and biochemical parameters were measured at baseline. Heart rate (HR) was measured during exercise.

RESULTS: Cyclists performed 7.3 hours (interquartilerange (IQR) = 5.4-7.5) of endurance exercise at intensity of 81.8 % (IQR = 74.9-85.8). Cyclists with baseline hsCRP $\geq$ 3 mg/L reported higher body mass, body mass index (BMI), waist-circumference and total-cholesterol. An increase in hs-CRP was following endurance exercise. Cyclists with any elevation of hs-CRP reported a higher BMI, HR during exercise and exercise intensity. Binary logistic regression analysis showed BMI (OR = 1.24, 95% CI = 1.04-1.48) and cycling distance (OR = 0.22, 95% CI = 0.06-0.76) were associated with post-exercise hs-CRP elevations.

CONCLUSION: Body mass, BMI, waist-circumference, total- and HDL-cholesterol are associated with baseline hsCRP, whereas BMI and cycling distance were associated with hs-CRP elevations. These findings suggest that anthropometry parameters and lipid levels attributed to baseline hs-CRP, while anthropometry parameters and cycling intensity attributed to post-exercise hs-CRP elevations.

KEYWORDS: C-reactive-protein, exercise, endurancecycling, inflammation, acute-phase-response

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