

Factors associated with C-reactive protein at the early stage of acute myocardial infarction in men

I read with great interest the article by Piestrzeniewicz et al. [1] entitled: 'Factors associated with C-reactive protein at the early stage of acute myocardial infarction in men' in which the authors investigate the factors most significantly associated with blood levels of C-reactive protein (CRP) in patients at the early stage of ST-segment elevation acute myocardial infarction (STEMI).

The investigators take into account that there are sex-related differences in plasma levels of CRP and adipokines. So, the study was designed for males. They concluded that glucose at admission and resistin are independently associated with elevated levels of CRP in men during the early stage of STEMI. It has been previously mentioned that early CRP release in acute coronary syndromes is possibly due to endothelium dysfunction, atherosclerosis, plaque vulnerability, extension of coronary disease, severity of thrombosis phenomena and impaired coronary perfusion [2]. However, the authors did not report blood sampling during the day-time. Two aspects, related to acute coronary syndromes, circadian rhythm onset and CRP kinetics release, have not been specifically addressed.

Firstly, it is established that the occurrence of acute myocardial infarction in the daytime is not uniform; rather it occurs with rhythmic variations [3]. The existence of such a circadian rhythm suggests acute myocardial infarction onset may be associated with physiological rhythms, with a peak during certain times of the day and night. Experimental studies have shown that the inflammatory processes and the immune response may vary throughout the 24 hour circadian period [4].

Secondly, environmental factors may influence CRP levels as well as the levels of other inflamma-

tory mediators. Recently, Rudnicka et al. [5] demonstrated in a large study of 9,377 men and women seasonal and diurnal variations in high-sensitivity CRP as well as other biomarkers. Furthermore, we have reported light/dark variations in the endogenous production of CRP in patients with STEMI. Circadian changes of melatonin levels may be responsible, at least in part, for these CRP level variations [6].

Therefore, in assessing the determinants of CRP release, equally as important as sex differences, it is important to consider temporal variations as a source of heterogeneity that may bias the results of the study.

References

1. Piestrzeniewicz K, Łuczak K, Goch JH. Factors associated with C-reactive protein at the early stage of acute myocardial infarction in men. *Cardiol J*, 2009; 16: 36-42.
2. Brunetti ND, Pellegrino PL, Correale M, Troccoli R, Di Biase M. Early and late determinants of C-reactive protein release in patients with acute coronary syndrome. *Int J Cardiol*, 2006; 112: 136-138.
3. Abo T, Kawate T, Itoh K, Kumagai K. Studies on the bioperiodicity of the immune response. Circadian rhythms of human T, B, and K cell traffic in the peripheral blood. *J Immunol*, 1981; 126: 1360-1363.
4. Muller JE, Stone PH, Turi ZG et al. Circadian variation in the frequency of onset of acute myocardial infarction. *N Engl J Med*, 1985; 313: 1315-1322.
5. Rudnicka AR, Rumley A, Lowe GD, Strachan DP. Diurnal, seasonal, and blood-processing patterns in levels of circulating fibrinogen, fibrin D-dimer, C-reactive protein, tissue plasminogen activator, and von Willebrand factor in a 45-year-old population. *Circulation*, 2007; 115: 996-1003.
6. Dominguez-Rodriguez A, Garcia-Gonzalez M, Abreu-Gonzalez P, Ferrer J, Kaski JC. Relation of nocturnal melatonin levels to C-reactive protein concentration in patients with ST-segment elevation myocardial infarction. *Am J Cardiol*, 2006; 97: 10-12.

Martín J. García González, MD, PhD, FESC
 Coronary Care Unit, Department of Cardiology
 Hospital Universitario de Canarias
 La Laguna-Tenerife, Spain
 e-mail: mjgg181262@hotmail.com