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Correspondence

Elevated C-reactive protein levels in individuals with low high-density lipoprotein cholesterol levels

To the Editor,

We read, with interest, the studies by Fredrikson et al [1] and Mostaza et al [2] in the last issues of *Metabolism*. They both described an association between the plasma levels of C-reactive protein (CRP) and high-density lipoprotein cholesterol (HDL-C). Fredrikson et al [1] analyzed 760 individuals with a plague in the right carotid artery. The plasma levels of CRP were significantly higher in the individuals from the first quartile with lowest HDL-C levels than in the fourth quartile with highest HDL-C levels. Mostaza et al [2] examined CRP levels and prevalence of chronic infection in subjects with hypoalphalipoproteinemia. In 86 case patients (HDL-C <40 mg/dL), if compared with 86 matched (according to age, sex, body mass index, and smoking habit) control individuals with HDL-C in reference range, they have detected significantly elevated level of plasma CRP. However, the prevalence of chronic infections did not differ significantly between the 2 groups.

CRP is the acute phase serum protein produced by the liver. Elevated plasma levels of CRP have been repeatedly found in patients with cardiovascular disease and myocardial infarction, and it is believed that the CRP is an independent risk factor of coronary artery disease [3]. Higher plasma levels of CRP have been found in correlation not only with infection, but also in correlation with, for example, elevated body mass index or with some lipid parameters, smoking, or dietary habits [4].

HDL particles play the main role in reverse cholesterol transport. HDL-C levels are inversely related to risk of cardiovascular diseases when compared with CRP levels. It has been found that the cardioprotective effect of HDL particles is not only because of their lipoprotein metabolic effect [5], but also because of anti-inflammatory activity, which involves expression of endothelial cell adhesion molecules [6], formation of oxidized low-density lipoprotein, and also probably suppression of CRP production in the liver [7].

We have analyzed the association between CRP levels and plasma HDL-C levels in a total of 1128 unrelated white men aged 48.8 ± 10.6 years and recruited as a representative 1% population sample [8]. Nobody has any sign of acute infection (fiber, inflammation, or self-reported problems). The markers for chronic infections have not been analyzed.

Table 1
Plasma levels of CRP (geometric means ± SE, in mg/L) in men with different HDL-C levels

HDL-C (mg/dL)	n	CRP	*P*
<40	183	1.50 ± 0.07	<.001
≥40	945	1.06 ± 0.02	

In agreement with the previously described results [1,2], we have found significantly elevated levels of plasma CRP in men with HDL-C lower than 40 mg/dL (n = 183), in comparison with men with HDL-C higher than 40 mg/dL (n = 945) (1.50 ± 0.07 vs 1.06 ± 0.02 mg/L, $P < .001$) (Table 1).

It is well known that infection state is associated both with increase of CRP and decrease of HDL-C concentrations. On the other hand, recent findings also described inverse correlation between CRP concentration and HDL-C in patients with hypo- or hyper–α-lipoproteinemia without acute/chronic infection or inflammation [2,7]. Together with our results, it could be summarized that infections did not necessarily mediate the relationship between low HDL-C levels and increased CRP levels.

HDL particles themselves possess some anti-inflammatory activity. It is well possible that both CRP and HDL-C plasma concentrations are controlled simultaneously by some as yet unexplained mechanisms.

Acknowledgment

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Reply

To the Editor,

We read with interest that the findings of Hubacek et al further confirm ours showing an inverse association between high-density lipoprotein cholesterol (HDL-C) and C-reactive protein (CRP). In our study including 760 men and women, we found a strong inverse association, with CRP levels being 88% higher in those with HDL-C level lower than 1.1 mmol/L (42.5 mg/dL) than in those with HDL-C level higher than 1.6 mmol/L (62 mg/dL). Hubacek et al report about a similar association between CRP levels in white males with HDL-C level higher and lower than 40 mg/dL.

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Influence of endurance training on energy intake, norepinephrine kinetics, and metabolic rate in older individuals.

Poehlman E, Gardner A, Goran M. Metabolism 1992;41(September):941-8

Dear Dr Field,

In the above-referenced paper, we presented data purportedly showing that endurance training stimulates an increase in energy intake and resting metabolic rate, which are associated with an increase in sympathetic nervous system activity, as determined by norepinephrine kinetics in older individuals. This study purports to have extended an earlier study (*Am J Physiol* 1991;261:E233-9) where the energy intake levels were obtained from the subjects' diaries. In the referenced study, energy intake was also covertly monitored.

I now wish to report that I intentionally omitted a material data point for the norepinephrine results for 1 of the 7 subjects reported in Figure 4 and the associated text of the referenced *Metabolism* paper to make the association between increased sympathetic nervous system activity and endurance training appear more significant than was actually the case.

I also report that I intentionally omitted norepinephrine data in a 1994 paper (*J Appl Physiol* 1994;76(6):2281-7) that I have also asked to be retracted. Because both the 1992 and 1994 papers relied on results where data were intentionally omitted, the 1991 *J Appl Physiol* paper should not be relied upon.

I take sole responsibility for the intentional omission. My coauthors were unaware of my actions and I now publicly exonerate them. I request that you publish this letter of retraction.

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