

**Editöre Mektup****Letter to the Editor****Serum gamma-glutamyltransferase and the burden of atherosclerosis in patients with acute coronary syndrome**

To the Editor,

We read with interest the recently published article entitled “Serum gamma-glutamyltransferase activity and acute coronary syndromes” by Dr. Duran et al.<sup>[1]</sup> in your journal. Frankly, we appreciate the authors for their original study. They evaluated the relationship between serum gamma-glutamyltransferase (GGT) levels and the burden of atherosclerosis in patients with acute coronary syndrome (ACS). Serum GGT levels on admission were associated with increased burden of atherosclerosis in patients with ACS. This might account for the cardiovascular outcomes associated with increased GGT levels.

GGT is an old serum enzyme that is widely used as a marker of hepatobiliary disease or alcohol consumption. The role of GGT in cardiovascular disease is partly explained by the correlation of GGT with several metabolic risk factors, including obesity, dyslipidemia, hypertension, diabetes, and metabolic syndrome.<sup>[2]</sup> However, the exact mechanism behind the association between GGT and cardiovascular disease is still unknown. In patients with raised serum GGT levels, we usually think about a problem with biliary epithelium, cholestasis, or excessive alcohol consumption. GGT itself without other inflammatory markers may not provide information to clinicians about the burden of atherosclerosis. In the CARDIA (Coronary Artery Risk Development in Young Adults) Study, serum GGT levels were strongly and positively correlated with determinants of oxidative stress such as the levels of C-reactive protein, uric acid, and fibrinogen.<sup>[3]</sup> We thus think that GGT should be evaluated with these inflammatory markers.

Even slight increases in body mass index (BMI) can cause an average of 25% elevation in GGT; the el-

evation is 50% in people with BMI over 30 kg/m<sup>2</sup>.<sup>[4]</sup> It is also realized that moderate smoking results in a 10% increase in GGT, while heavy smoking produces a 20% rise.<sup>[5]</sup> Multiple drugs can increase serum GGT. Anticonvulsants cause the greatest increase. Conversely, oral contraceptives and pregnancy bring about a 20-25% fall in GGT.<sup>[6]</sup> It would be useful if the authors provided data about the patient’s BMI and history of drug use.

Sincerely,

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## Authors reply

To the Editor,

We reported a relationship between serum gamma-glutamyltransferase (GGT) and burden of atherosclerosis in patients with acute coronary syndrome (ACS) in the June 2013 issue of Arch Turk Soc Cardiol.<sup>[1]</sup> We read with interest the letter to the editor about our article by Dr. Koza et al.<sup>[2]</sup> We thank them and reply to their interesting comments on our article.

As they pointed out, although the exact mechanism is still unclear, the level of GGT is an independent risk factor for the development of coronary artery disease (CAD) and morbidity and mortality of CAD.<sup>[3]</sup> They noted the contribution of some metabolic risk factors such as hypertension, dyslipidemia and diabetes to explain an association between GGT and CAD.<sup>[4]</sup> They suggested that only serum GGT levels, without other inflammatory markers, may not provide information to clinicians about the burden of atherosclerosis. However, as Dr. Bozbaş noted in the same issue of the journal as an editorial comment, we knew high serum GGT concentrations, independent of hepatic disease and alcohol consumption, were associated with atherosclerotic vascular disease and related conditions.<sup>[5,6]</sup> GGT activity has been observed in coronary atherosclerotic plaques, and serum GGT is a marker of oxidative stress and inflammation.<sup>[7]</sup> Serum GGT can trigger the oxidative stress within plaque and contribute to the vulnerability and evolution of the plaques.<sup>[7]</sup> Elevated serum GGT concentration is an independent cardiac risk factor and predicts cardiovascular events, non-fatal myocardial infarction and cardiac mortality in unselected populations, in patients with history of myocardial infarction, and in patients with ACS after adjusting for other known CAD risk factors as well as alcohol consumption.<sup>[3,8]</sup>

The authors pointed out an effect of body mass index (BMI), smoking and drugs on serum GGT levels. Unfortunately, we did not evaluate BMI or the history of drug use.

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