GGT as predictor of coronary collateral development in chronic coronary total occlusion

To the Editor,

We read with great interest the manuscript written by Şahin et al. (1) February issue of Anatolian Journal of Cardiology. In that study they investigated the relation between gamma-glutamyltransferase (GGT) level and presence of coronary collateral circulation in patients with chronic total occlusion (CTO). They found that GGT was an independent predictor of poor collateral development.

Gamma glutamyl transferase is a component of intracellular antioxidant-protective mechanisms acting as a mediator in transmembranous transport of glutathione that protects cells against oxidants (2). A high GGT level indicates the response to oxidant stress, which leads to the depletion of glutathione and induces the expression of GGT. Oxidative stres leads to impairment in endothelial dysfunction and disruption in signal transduction of growth factors, which may induce deterioration in the development of collateral circulation. A high GGT level is an indicator of oxidative stress and may predict poor collateral development in patients with CTO.

As already investigated by me and my colleagues, besides being an indicator of anti-oxidant capacity, in the presence of a transition metal such as iron, GGT and glutathion may alter their function from an anti-oxidant to a pro-oxidant, leading to the formation of free radicals and lipid peroxidation (3, 4). In our study we found that GGT and uric acid levels may independently predict poor collateral development in patients with CTO. From this point of view, results of the study conducted by Sahin et al. confirm our results. It is documented that well grown collateral circulation has beneficial effects on ventricular function, infarct size, and aneurysm formation (5). Taken together with results of Şahin's study, we conclude that GGT may be used as a readily available marker for coronary collateral development.

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Available Online Date: 19.03.2014

DOI:10.5152/akd.2014.5445

Author`s Reply

To the Editor,

Gamma-glutamyltransferase (GGT) is important in maintaining adequate concentrations of intracellular glutathione to protect cells against oxidants. GGT expression can be induced by oxidative stress and inflammatory cytokines. Therefore, serum concentrations of GGT can be used as a marker for increased oxidative stress in humans (1). Oxidative stress is one of the important cellular mechanisms for the development of endothelial dysfunction (2). Previous studies have shown a relation between serum GGT levels and CAD. Şen et al. (3) reported that serum GGT levels in patients with coronary slow flow phenomenon were higher than controls. In addition, Duran et al. (4) showed that high level of serum GGT on admission might be associated with absence of coronary collateral vessel in patients with acute coronary syndrome.

We read with great interest and pleasure the manuscript written by Şarlı et al. (5) published in Coronary Artery Disease. In that study investigated the relation between serum gamma-glutamyl transferase levels and coronary collateral circulation in patients with chronic coronary total occlusion (CTO) (5). They found that serum gamma-glutamyl transferase was an independent predictor of poor collateral development. Also they speculated that GGT is a simple and readily available marker for sufficiency of coronary collateral circulation in patients with CTO. In our study we show that higher GGT levels are associated with poor coronary collateral circulation in patients with CTO. Namely, results of the study conducted by Şarlı et al. (5) confirm our results. Also the results of Şarlı et al.(5) and our study show that GGT may be used as a marker for coronary collateral development.

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Available Online Date: 19.03.2014