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LETTER

Determinants of endothelial dysfunction in patients with non-alcoholic steatohepatitis

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We thank Balta et al. for their comments (1). In our study we investigated the presence of endothelial dysfunction and potential predictors of endothelial dysfunction (ED) in patients with non-alcoholic steatohepatitis (NASH) (2). We found that serum gamma glutamyl transferase (GGT) and alanine transaminase (ALT) concentrations were predictors of ED in patients with NASH. Balta et al. mention that if inflammatory markers were studied, impact of these markers on ED might have been found. Moreover, they state that inflammation plays a major role in the development of ED and atherosclerosis (3). Lack of data concerning inflammatory markers may be a limitation of our study. However, as shown previously, associations established between GGT and hs-CRP, which is a major inflammatory marker for cardiovascular risk, suggest that elevated serum GGT—as a marker of oxidative stress—is also involved in the inflammatory process, contributing to the pathogenesis of atherosclerosis (4-6). So, we may conclude that GGT indeed is of importance in the development of ED in patients with NASH. Moreover, Balta et al. mention that inflammatory mediators can be affected by atherosclerotic risk factors such as smoking, alcohol consumption, hypercholesterolemia, and hypothyroidism as well. Patients with daily alcohol consumption over 30 g, which may influence serum concentrations of GGT, AST, and ALT, were not included in our study. Furthermore, patients with a history of smoking and hyperlipidemia were excluded in our study (2). In addition, patients with known hypothyroidism were not enrolled.

We also thank Dogru et al. for their valuable comments (7). Dogru et al. mention that the use of standard oral glucose tolerance tests (OGTT) would be more accurate than fasting plasma glucose (FPG) in identifying patients with or without diabetes. In our study we used FPG concentrations and the medical history of the patients to exclude diabetes. Utilization of OGTT would probably add valuable information in detecting patients with diabetes. However, American Diabetes Association guidelines state that FPG over 126 mg/dL is a diagnostic criterion for diabetes as well as OGTT (8). We consider that, taken together with the medical history, FPG is still a robust indicator of diabetes. Dogru et al. also argued from results of previous studies that there is only a weak correlation between carotid intima-media thickness (CIMT) and non-alcoholic fatty liver disease (NAFLD). However, in agreement with our results, Fracanzani et al. showed that CIMT was higher in patients with NAFLD compared with healthy controls in a study that included 125 subjects with NAFLD and 250 healthy subjects (9). Dogru et al. also concluded that NAFLD may not have a direct impact on carotid atherosclerosis and it may contribute to cardiovascular diseases by acting in concert with metabolic abnormalities. However, in our study serum triglyceride concentrations and FPG were similar in patients with NASH and in controls. Finally, as we showed by linear regression analysis, body mass index was not significantly associated with impaired flow-mediated dilatation (FMD) and increased CIMT in our patients.

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