

Association between Non-Alcoholic Steatohepatitis and Left Ventricular Diastolic Dysfunction in Type 2 Diabetes Mellitus (*Diabetes Metab J* 2020;44:267-76)

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We would like to thank Dr. Yu for showing great interest in and providing insightful comments on our article, entitled “Association between non-alcoholic steatohepatitis and left ventricular diastolic dysfunction in type 2 diabetes mellitus,” which was published in *Diabetes & Metabolism Journal* [1].

In our study, we observed a smaller odds ratio with significant heterogeneity for left ventricular (LV) diastolic dysfunction associated with nonalcoholic fatty liver disease (NAFLD) or liver fibrosis in the presence of insulin resistance. This is a form of a negative multiplicative interaction between insulin resistance and hepatic steatosis/fibrosis in association with LV diastolic dysfunction [2]. The direction of the additive interaction, although not statistically significant, was also consistent with a negative interaction. Therefore, competing antagonism may exist between insulin resistance and hepatic steatosis/fibrosis, which share several common biological mechanisms and may compete with regard to outcomes [3,4]. The clinical implications of our study suggest that the presence of hepatic steatosis or fibrosis may be a “red flag” for subclinical cardiac dysfunction and diabetic cardiomyopathy among type 2 diabetes mellitus patients without severe systemic insulin resistance or other overt cardiometabolic diseases, seemingly low-risk patients.

We agree with Dr. Yu that long-term exposure to high blood pressure is an important risk factor for LV dysfunction and re-

modeling [5]. Although there is limited evidence on the association between the duration of hypertension and NAFLD or liver fibrosis, it may be reasonable for future studies to include the duration of hypertension as a potential confounder.

We also agree that randomized controlled trials should evaluate the beneficial effects of NAFLD intervention on LV diastolic dysfunction and remodeling. Prospective cohort studies as well as animal studies should seek to establish the underlying mechanisms and causality between NAFLD and diastolic dysfunction in type 2 diabetes mellitus. We are again grateful for Dr. Yu’s invaluable comments.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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