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Hepatic fibrosis – and not steatosis – is the main determinant of arterial stiffness in non-alcoholic fatty liver disease

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To the Editor,

We read with interest the recent paper by Styczyński and coworkers [1]. Their findings revealed no significant association between non-alcoholic fatty liver disease (NAFLD) on wedge liver biopsy and an increased arterial stiffness – as reflected by aortic pulse wave velocity (PWV) – in a sample of 120 morbidly obese patients. The authors are to be congratulated for specifically examining this issue in a high-risk clinical population of patients who were consecutively admitted for bariatric surgery. However, there are two major issues that should be considered when interpreting their results.

First, the histological characteristics of the 120 obese patients were not provided and, specifically, no data on the severity of hepatic fibrosis can be traced in the paper. This is not a trivial issue because the published literature clearly indicates that the presence and extent of fibrosis – and not of steatosis – are the main histological predictors of increased arterial stiffness both in patients with biopsy-proven NAFLD [2] and in those with diabetes [3]. The role of hepatic fibrosis in predicting PWV in NAFLD has been also confirmed at an imaging level. Accordingly, liver stiffness measurement (LSM) on transient elastography – a surrogate non-invasive imaging biomarker of liver fibrosis – has been recently shown to have a positive correlation with arterial stiffness measures of the brachial artery [4]. Taken together, these results have led to the hypothesis that hepatic and arterial stiffness may increase in parallel in patients with NAFLD, with the extent of hepatic extracellular matrix deposition (and not that of fat deposition *per se*) being the main predictor of PWV [4]. It is thus generally expected that arterial stiffness would be increased in NAFLD especially in the presence of advanced fibrosis – potentially indicating the presence of systemic profibrogenic stimuli acting on multiple anatomical sites (including the liver and the arterial wall) [5]. The second major problem in the study by Styczyński et al. [1] lies in the use of wedge liver biopsy – a procedure that does not allow a direct comparison with previous studies obtained with needle biopsy. Overestimation of fibrosis with the former method has been reported to occur as a result of tissue sampling in close proximity to the liver capsule [6]. In addition, wedge and needle biopsy may produce discrepant histological findings in morbidly obese patients undergoing bariatric surgery [7].

In conclusion, the authors are to be applauded for conducting an interesting study on the potential association between NAFLD and aortic PWV in morbidly obese patients. However, their main finding that no relationship exists between the two variables of interest is not surprising because the main determinant of arterial stiffness in NAFLD is clearly liver fibrosis, not steatosis *per se* [2–4]. In the future, it will be of interest to confirm whether the presence and extent of histological fibrosis (as determined on needle liver biopsy) and/or liver stiffness (as reflected by LSM on transient elastography) could actually act as independent predictors of arterial stiffness measures in morbidly obese patients admitted for bariatric surgery.

Conflicts of interest

The authors declared they do not have anything to disclose regarding conflict of interest with respect to this manuscript.

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