

## CORRESPONDENCE

### Letters to the Editor

# Cardiac Steatosis and Myocardial Dysfunction

Hammer et al. (1) showed that prolonged caloric restriction in obese patients with type 2 diabetes mellitus decreases body mass index and improves glucose regulation associated with decreased myocardial triglyceride (TG) content and improved diastolic heart function. We have 3 questions regarding this study and its outcome measures. The authors mentioned that one of the exclusion criteria for the study was the use of medications that influence lipolysis and glucose metabolism. Nicotinic acid and fish oil can alter serum and tissue TG levels through different mechanisms without affecting lipolysis (2,3). We would like to know if any of the patients in the study were taking these supplements or any other alternative medicines. Second, we would like to know the reason why 1 patient was excluded from the analysis of an already very small sample size. Third, and most importantly, we would like to know if there was any significant reduction in waist circumference in the study population. Central obesity, not body mass index, has been shown to be a very powerful indicator of cardiovascular morbidity and mortality compared with peripheral and/or overall adiposity (4,5). Knowing any changes in waist circumference and triceps skin thickness would be helpful in interpreting the factors that can affect diastolic function. The authors did not provide any information on these issues that can potentially cause bias while interpreting the results.

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## REFERENCES

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## Reply

We appreciate the interest of Drs. Dhoble and Patel in our recent publication in the *Journal* (1). In our model of prolonged caloric restriction in obese patients with type 2 diabetes mellitus, we showed dramatic changes in body mass index associated with a decrease in myocardial triglyceride content and improvements in left ventricular diastolic function.

During the study period, none of the patients used any medications or dietary additives that may affect lipid or glucose metabolism. This includes nicotinic acid analogs, statins (patients using statins were instructed to stop 3 weeks before the first magnetic resonance study), and fish oil supplements. We therefore believe the favorable effects we observed can be attributed to the prolonged caloric restriction and associated weight loss. This is in line with other studies showing improvements in myocardial function after bariatric surgery (2).

As correctly stated, the sample size of the study was relatively small. One patient was excluded from analysis, solely for spectroscopic measurements of the heart, because of insufficient quality of the obtained spectra. For all other measurements, this patient was included in the analyses. The fact that we had to exclude this patient highlights the difficulty of obtaining measurements on myocardial triglyceride content, especially in obese patients. Future work should be undertaken to make the technique suitable for general application in clinical practice.

We agree with Drs. Dhoble and Patel that central obesity is a more powerful indicator of cardiovascular morbidity and mortality than body mass index. However, the changes illustrate the magnitude of the observed effect of prolonged caloric restriction. Measurements of central obesity were also performed (but initially not presented) and showed a decrease in waist circumference from  $115 \pm 2$  cm to  $94 \pm 3$  cm ( $p < 0.001$ ).

These results show the potential of prolonged caloric restriction as a therapeutic option for obese patients with type 2 diabetes mellitus. Furthermore, it underlines the potential of metabolic cardiovascular imaging in detecting early unfavorable changes in myocardial metabolism and function in this common disease.

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