Reviewer’s report

Title: Effect of weight loss on circulating fatty acid profiles in overweight subjects with high visceral fat area: a 12-week randomized controlled trial

Version: 0 Date: 11 May 2017

Reviewer: Brian A. Irving

Reviewer’s report:

In the manuscript entitled "Effect of weight loss on circulating fatty acid profiles in overweight subjects with high visceral fat area: a 12-week randomized controlled trial”, Lee and colleagues determined the effect of 12 weeks of weight loss on circulating fatty acids in overweight adults. Specifically, the randomized 80 overweight subjects with high visceral fat to mild calorie restriction (a 300 kcal/day) or time matched control groups. In addition to expected outcomes of 12 weeks of caloric restriction. The authors observed significantly greater reductions in total saturated fatty acid, palmitic acid, stearic acid, total monounsaturated fatty acid, palmitoleic acid, oleic acid, eicosadienoic acid and dihomo-γ-linolenic acid levels in the weight-loss group compared to control. In addition, C16 Δ9-desaturase activity significantly decreased and Δ5-desaturase activity significantly increased after weight loss, which could have mediated some of the observed changes in circulating fatty acids. Overall, this paper is well written and provides insight into the potential impact of weight loss on changes in fatty acid profiles. However, a few critiques/criticism need to be addressed.

Page 3, lines 21 to 28. Authors could provide some citations supporting their statements on desaturase activity in obesity and diabetes.

Although, visceral fat is more metabolically active. The contribution of mobilizing visceral fat vs. is less than mobilizing subcutaneous fat to circulating fatty acids (see work from Samuel Klein and/or Michael Jensen). This should be discussed.

Why did the authors choose a 300 kcal/day deficit?

Did the composition of the diet (% cho:fat:protein) change from baseline during the diet period? Also did the type of dietary fats change?

What Hounsfield unit ranges were used to identify adipose tissue? [e.g., AT:-190 to -30] P7-P8. It is unclear from the text that the metabolite extraction and analysis by GC/MS was to measure fatty acid metabolites. Please clarify procedure with a bit more detail.

Why did the authors on perform repeated measures ANOVA or mixed model analyses to test for significant between and within group changes?
During follow-up testing was the test group still undergoing caloric restriction or were they on a weight maintaining diet? This should be discussed.

Table 3 presents the results of the changes in fatty acids in response to the intervention. The data are reported as relative peak area. Why did the authors not report changes in actual concentrations? What is the physiological relevance of these changes in peak area? Does this equate to large or small changes in concentrations?

Perhaps a figure showing the significant changes in the fatty acids would facilitate interpretation of the data.

Likewise, a figure showing the relationship between changes in desaturase activities and changes in metabolic outcomes including visceral fat, insulin, HOMA-IR would also be helpful for interpretation.

Were the subjects taking any medications that may affect lipid metabolism? Did they change during the study period? This should be discussed.

Perhaps the authors can further discuss the clinical significance of their findings? Are there patients/individuals who are resistant to these changes and thus remain insulin resistant etc.

Minor:

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