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Letter to the Editor

Comment on 'The effect of (L-)carnitine on weight loss in adults: a systematic review and meta-analysis of randomized controlled trials'

Recently, Pooyandjoo *et al.* (1), published an interesting article concerning the use of (L-)carnitine on weight loss. We had an optimistic impression that an accessible nutritional supplement – the (L-)carnitine – could, in fact, contribute to weight loss, even in small amounts of 1.33 kg (95% CI = −2.09 a − 0.57). Especially because overweight and obesity have been responsible for reducing about 10 years of people's lives (2). However, when we look more closely, some elements draw attention and should be highlighted, including methodological and practical issues.

First, we were very impressed with the high quantity of articles retrieved and excluded in this meta-analysis. Of the 909 identified studies, less than 1% was included. This is worth mentioning, few exclusion parameters can explain the high number of titles found. Analyzing the nine studies included in Table 1, only four used exclusively (L-)carnitine disassociated another independent variable. That is, the remaining five articles use other drugs – orlistat (3) and sibutramine (4) – or changes in lifestyle, including exercise (5,6) and caloric restriction (7). How to ensure that the effect on body mass was from (L-)carnitine, and not from other proposed interventions? This is a severe methodological flaw and must be at least discussed. Moreover, the authors did not present exclusion parameters for the population studied, and there is substantial variability between samples, especially considering diabetic and obese women (7), diabetic patients (3), patients with bipolar disorder (8), diabetic women (5) and obese women (6). Thus, it seems premature to conclude that 'carnitine might be an effective drug for weight loss in adults' without considering the results according to the characteristics of studied participants. Figures 2 to 5 are showing results from mixed studies – using (L-)carnitine alone or in association with other therapies. Curiously, studies from Pistone *et al.* (9) and Coelho *et al.* (10) were not included in the meta-analysis. However, when considering these two researches, plus three others with exclusive treatment with (L-)carnitine (5,8,11), not surprisingly, the statistical analysis showed no significance effect of (L-)carnitine to reduce body mass (Fig. 1).

With respect to practical aspects, the argument that 'Anti-obesity drugs have no side effects of invasive surgeries, and hence, they are more commonly used than other options like physical activities' seems inappropriate. Although we agree that invasive surgeries tend to have worse collateral effects, generalization about 'anti-obesity drugs' and the consequent encouragement to indiscriminate its use seems at least irresponsible, especially associated with the absence of any mention of possible risks involved. Specifically, the security in the (L-)carnitine intake does not seem to be clearly established yet, especially considering some of its metabolites, as trimethylamino-N-oxide and long-chain acylcarnitines, which may be associated with increased cardiometabolic risks (12). Considering the security in the (L-)carnitine consumption, authors pointed-out that (L-)carnitine has been applied for prevention of cardiovascular disease, end-stage kidney diseases, dialysis-related hypertension, treatment of persistent depressive disorder and treatment of non-alcoholic fatty liver disease, implicitly suggesting that this supplement has positive effects in these cases. However, after reading the cited articles, only those related to persistent depressive disorder and treatment of non-alcoholic fatty liver disease indicate a positive effect, while others show no effect of the supplement. In addition, all seem to be cautious about the finding, which does not seem to be the tone of Pooyandjoo's *et al.* (1) article. Finally, even if, for some reason, the analyses were correct, the inferences about the magnitude of the loss indicated the results should be considered. After all, a mean difference 1.33 kg (95% CI:−2.09 to −0.5) is not nearly clinically relevant.

For these reasons, the suggestion of (L-)carnitine uses to weight loss seems not appropriated, and possible adverse effects should not be ignored. We have no magic pill that leads to health, and guidelines on good publication practice should demanded from all researchers.

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Conflict of interest statement

No conflict of interest was declared.

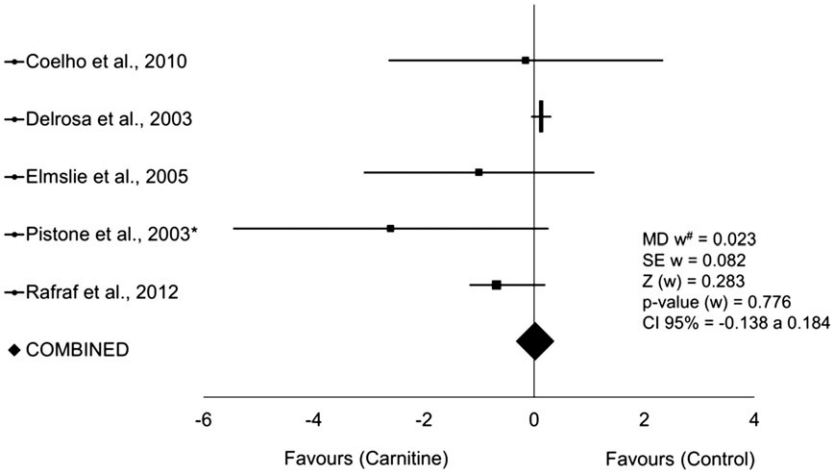

Figure 1 Forest plot of weight change outcome. MD, # mean of differences; SE, standard error.

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