

Reply: Total antioxidant capacity after malabsorptive bariatric surgery

To the Editor:

The letter of Dr Prior et al gives us the opportunity to add some considerations to the data reported in our article published in *Metabolism* in November 2008 [1].

Several techniques of bariatric surgery do exist, each one with its specific clinical indications and mechanisms of action. Therefore, it is not easy to compare different interventions, above all with regard to certain effects hypothesized to be caused, at least in part, by a lipid-specific malabsorption, like the instance of coenzyme Q₁₀. In fact, the authors of the letter studied 9 patients, 4 of which underwent a restrictive surgery and only the other 5 a malabsorptive surgery similar to that of our study. Moreover, as we recently reviewed [2], different patterns of specific single antioxidant are reported in the literature.

The authors studied their patients 1 and 6 months after surgery, whereas we performed only 1 postsurgical evaluation after a period ranging from 3 to 6 months. They found a significant variation in total antioxidant status after 6 months, but not after 1 month. Therefore, our finding could be in agreement with theirs. However, we especially focused on coenzyme Q₁₀; and on the other hand, the authors do not specify what method they used to measure total antioxidant status. This is quite relevant because of the wide variety of methods and the complexity of antioxidant systems.

After these preliminary remarks, bariatric surgery is well known to result in many beneficial metabolic effects together with the loss of weight, among which great importance is given to the improvement of insulin resistance; and it is also true that diabetes mellitus is associated to an increase in oxidative stress [3], although data on antioxidant systems in obesity are less unequivocal. All patients in our study showed insulin resistance, estimated by the homeostasis model assessment of insulin resistance, even if some of them had a fasting glucose less than the cutoff for the diagnosis of diabetes. All of them improved their insulin resistance, together with other metabolic parameters, after surgery. Another important parameter, as we discussed in our article, could be uric acid, which declined in the postoperative period, possibly contributing to the decreased total antioxidant capacity.

In conclusion, we are in agreement with the authors of the letter about the most important conclusion, saying that bariatric surgery may improve the antioxidant status, likely by improving insulin resistance, and that this effect might be clearer in diabetic subjects, who have an increased oxidative stress. However, the kind of surgical technique, the period of

observation, and the analytical methods chosen, besides sex (our patients were almost all women) and clinical conditions, can be decisive factors to make some effects well noticeable. However, close to the large number of benefits, some adverse effects, more or less specific for a given surgical technique, are always possible, opening the possibility that some integrative treatment could be needed in patients who undergo bariatric surgery.

Antonio Mancini

Erika Leone

Vincenzo Di Donna

Alfredo Pontecorvi

*Catholic University of the Sacred Heart
Rome, Italy*

Roberto Festa

Gian Paolo Littarru

Institute of Biochemistry

*University "Politecnica delle Marche"
Ancona, Italy*

Roberto Tacchino

Department of General Surgery

*Catholic University of the Sacred Heart
Rome, Italy*

Andrea Silvestrini

Elisabetta Meucci

Institute of Biochemistry and Clinical Biochemistry

*Catholic University of the Sacred Heart
Rome, Italy*

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