

# Abstract

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## Distinctive modulation of inflammatory and metabolic parameters in relation to zinc nutritional status in adult overweight/obese subjects.

Costarelli L, Muti E, Malavolta M, Cipriano C, Giacconi R, Tesesi S, Piacenza F, Pierpaoli S, Gasparini N, Faloia E, Tirabassi G, Boscaro M, Polito A, Mauro B, Maiani F, Raguzzini A, Marcellini F, Giuli C, Papa R, Emanuelli M, Lattanzio F, Mocchegiani E.

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**BACKGROUND:** Overweight and obesity are associated with low grade of inflammation and chronic inflammatory response characterized by abnormal production and activation of some pro-inflammatory signalling pathways. Taking into account that obesity is the direct result of an imbalance between energy intake and energy expenditure, the nutritional factors in the diet, with particular focus on zinc, may play a pivotal role in the development of obesity-associated comorbidities.

**OBJECTIVE:** Considering the potential interactions among zinc nutritional status, inflammation, overweight/obesity and insulin secretion, the aim of the present work was to clarify the influence of zinc dietary intake on some metabolic, inflammatory and zinc status parameters in adult overweight/obese subjects.

**RESULTS:** We found a close interrelationship between nutritional zinc and obesity. In particular, subjects with a lower zinc dietary intake display a deeper inflammatory status, general impairment of the zinc status, an altered lipid profile and increased insulin production with respect to obese subjects with normal zinc dietary intake. Moreover, in the presence of low dietary zinc intake, the obese subjects are less capable to respond to oxidative stress and to inflammation leading to the development of obesity or to a worsening of already preexisting obesity status.

**CONCLUSION:** In conclusion, a possible zinc supplementation in obese subjects with a deeper inflammatory status and more altered zinc profile may be suggested in order to limit or reduce the inflammation, taking also into account that zinc supplementation normalizes "inflammaging" as well as zinc profile leading to a correct intra- and extracellular zinc homeostasis.

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