Trace elements and human obesity: An overview

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Abstract

The human body requires certain amount of trace elements to function properly (especially those that are classified as essential to health). Most elements are co-factors in the molecular mechanisms within the body but when in excess can also cause toxicity. Concentrations of some elements in excess (above optimum) or deficient amount can progress to some types of metabolic abnormalities which could lead to obesity. Obesity is a multifactorial condition with multiple pathways including environmental, dietary, and genetic. All these factors, including elemental abnormalities can disrupt the molecular mechanisms. Whilst there is evidence that obesity causes several elemental deficiencies, there is lack of knowledge on how these elemental deficiencies are related to an obese individual. This review examined the literature to determine if there are biological reasons to believe that low or increased concentrations of certain trace elements, namely, copper, magnesium, iodine, cobalt, molybdenum, boron, antimony, aluminium, chromium, selenium, manganese, calcium, zinc and iron might be associated with increased body fat.

Key words: trace elements, toxic metals, obese, obesity, fat disposition, deficiency, diet, nutrition, essential minerals and micronutrients