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NUT INTAKE AND ITS LINK WITH GLUCOSE/INSULIN METABOLISM AND INFLAMMATORY PARAMETERS: IS ADIPOSITY MEDIATING THESE ASSOCIATIONS?

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Nuts are a matrix of important bioactive compounds such as vitamins, minerals, phenolic compounds, carotenoids and phytosterols [1]. However, they also contain high levels of fats (ranging from 44% to 79%), meaning they are an energy-dense food [2, 3]. In fact, until the late 1980s, they were often considered an unhealthy food group. Since then, their nutritional value and impact on health has started to be explored and re-recognized worldwide [4]. Indeed, the beneficial effect of nut intake on cardiovascular disease has been widely documented [5], whereas there are conflicting results regarding the beneficial effects of nuts on parameters related to both inflammatory [6] and glucose/insulin metabolism [1, 7]. Importantly, evidence derived from both randomized clinical trials and epidemiological studies have reported that there is no detrimental effect of nut consumption on body weight parameters [8, 9]. Nevertheless, until now, there had not been any previous study evaluating the association of nut intake and parameters of inflammation or glucose/insulin metabolism considering the regulatory role of certain measures of body fat.

In July, Mazidi and collaborators published novel insights into the association between nut consumption and glucose/insulin metabolism and inflammation, additionally assessing the mediating role of adiposity [10]. Using cross-sectional data from the American National Health and Nutrition Examination Survey (NHANES), they included a total of 16,784 overweight adults. Almost half of the subjects were females, the vast majority of the subjects (70%) were of Caucasian (non-Hispanic) ethnicity, and more than half of the population was married.

In their analysis, they differentiated the effect of nut intake on glucose/insulin metabolism (e.g., fasting plasma glucose and insulin, HOMA-IR) and inflammation (e.g., C-reactive protein (CRP)) with or without adjustments for adiposity factors (e.g., body mass index (BMI), waist circumference (WC) and visceral adiposity index (VAI)). Moreover, they assessed the indirect effect (i.e., mediated effect) of adiposity factors by independently evaluating the association between the frequency of nut consumption and adiposity factors, together with the association of adiposity factors and glucose/insulin metabolism and inflammation.

This is the first study assessing the effect of nut intake on inflammatory and glucose/insulin metabolism markers in the context of a presumed fat-mediating role.

As a primary approach, they reported that most of the inflammatory and glucose/insulin parameters were inversely and significantly associated to the frequency of nut consumption (in quartiles) after adjustments for different confounders. The specific fat content of nuts, together with their high fiber content and low glycemic index, may explain their putative role in inflammation and glucose/insulin metabolism, which may be also mediated by the adiposity status of nut consumers [11]. In fact, they also showed significant inverse associations between all the adiposity parameters and the frequency of nut consumption, together with a significant positive association between all the adiposity mediators and all the glucose/insulin and inflammatory parameters.

With regard to the indirect effects of each adiposity parameter, they showed a differential contribution on glucose/insulin and inflammatory parameters. For example, in case of BMI and WC, the mediated effects were significant for the associations between the frequency of nut consumption and CRP and most of the glucose/insulin parameters. However, predicted visceral adipose tissue (pVAT), surprisingly, showed no mediation role in any association, whereas VAI showed a mediation role in the majority of the parameters. Importantly, results considering the direct effect revealed that nut consumption might be associated with inflammatory and glucose/insulin parameters

even after adjusting for BMI or WC. Moreover, CRP and HOMA-IR, among other parameters, were associated with nut intake, even after correction for either pVAT or VAI.

This is the first study assessing the effect of nut intake on inflammatory and glucose/insulin metabolism markers in the context of a presumed fat-mediating role. Overall, the authors reported that subjects with frequent consumption of nuts had an improved cardioprotective profile (glucose/insulin and inflammatory parameters) and that adiposity factors seem to play a mediator role in the association between nut consumption, inflammation and glucose/insulin metabolism parameters. However, the implication of each adiposity parameter varied from partially- to fully- contributing, depending on each glucose/insulin and inflammatory parameter. In spite of the cross-sectional nature of their analysis, these findings strongly support an important message about the essential role of weight modulation (and fat distribution) in the link between dietary recommendations and outcomes linked to different cardiometabolic diseases.

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