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Coffee Consumption and Glucose Metabolism: a Systematic Review of Clinical Trials

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Abstract : Objective: Epidemiological data shows an inverse association of coffee consumption with risk of type 2 diabetes mellitus. However, the clinical effects of coffee consumption on the glucose metabolism biomarkers remain controversial. Thus, this paper reviews clinical trials that evaluated the effects of coffee consumption on glucose metabolism. Research Design and Methods: We identified studies published until December 2014 by searching electronic databases and reference lists. We included randomized clinical trials which the intervention group received caffeinated and/or decaffeinated coffee and the control group received water or placebo treatments and measured biomarkers of glucose metabolism. The Jadad Score was applied to evaluate the quality of the studies whereas studies that scored ≥ 3 points were considered for the analyses. Results: Seven clinical trials (total of 237 subjects) were analyzed involving adult healthy, overweight and diabetic subjects. The studies were divided in short-term (1 to 3h) and long-term (2 to 16 weeks) duration. The results for short-term studies showed that caffeinated coffee consumption may increase the area under the curve for glucose response, while for long-term studies caffeinated coffee may improve the glycemic metabolism by reducing the glucose curve and increasing insulin response. These results seem to show that the benefits of coffee consumption occur in the long-term as has been shown in the reduction of type 2 diabetes mellitus risk in epidemiological studies. Nevertheless, until the relationship between long-term coffee consumption and type 2 diabetes mellitus is better understood and any mechanism involved identified, it is premature to make claims about coffee preventing type 2 diabetes mellitus. Conclusion: The findings suggest that caffeinated coffee may impairs glucose metabolism in short-term but in the long-term the studies indicate reduction of type 2 diabetes mellitus risk. More clinical trials with comparable methodology are needed to unravel this paradox.

Keywords : coffee, diabetes mellitus type 2, glucose, insulin
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