Can we treat metabolic diseases with diet?

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Introduction: Dietary interventions are the basis therapy for several cardio-metabolic diseases including obesity and type 2 diabetes. However, the effectiveness and sustainability of dietary macronutrient patterns and specific diets for weight loss and cardiovascular risk factor improvement is debated.

Methods: Data from individual weight loss intervention and type 2 diabetes treatment studies are reviewed and discussed. In addition, data from a recent meta-analysis to estimate the relative effectiveness of diets are highlighted (1).

Results: Compared with usual diet, low carbohydrate and low fat diets have a similar effect at six months on weight loss and reduction in cardio-metabolic risk parameters including lipid metabolism parameters and blood pressure. Moderate macronutrient diets result in slightly less weight loss. Among specific (including commercially available) diets, those with the largest effect on weight reduction in comparison with usual diet were those that significantly reduce carbohydrate intake. Overall, weight loss diminishes typically at 12 months among all macronutrient patterns and diets and the benefits for cardiovascular risk factors of all interventions, except the Mediterranean diet, essentially disappear. One exception, the recent DiRECT trial demonstrate that weight loss is proportional to type 2 diabetes remission in a long term very low calorie diet (2).

Conclusions: Moderate certainty evidence shows that most macronutrient diets result in modest weight loss, but improvements in cardiovascular risk factors. However, most of the dietary intervention lack long term effectiveness.

References:

1) Ge L, Sadeghirad B, Ball GDC, da Costa BR, Hitchcock CL, Svendrovski A, Kiflen R, Quadri K, Kwon HY, Karamouzian M, Adams-Webber T, Ahmed W, Damanhoury S, Zeraatkar D, Nikolakopoulou A, Tsuyuki RT, Tian J, Yang K, Guyatt GH, Johnston BC. Comparison of dietary macronutrient patterns of 14 popular named dietary programmes for weight and cardiovascular risk factor reduction in adults: systematic review and network meta-analysis of randomised trials. BMJ. 2020;369:m696.

2) Lean MEJ, Leslie WS, Barnes AC, Brosnahan N, Thom G, McCombie L, Peters C, Zhyzhneuskaya S, Al-Mrabeh A, Hollingsworth KG, Rodrigues AM, Rehackova L, Adamson AJ, Sniehotta FF, Mathers JC, Ross HM, McIlvenna Y, Welsh P, Kean S, Ford I, McConnachie A, Messow CM, Sattar N, Taylor R. Durability of a primary care-led weight-management intervention for remission of type 2 diabetes: 2-year results of the DiRECT open-label, cluster-randomised trial. Lancet Diabetes Endocrinol. 2019;7:344-355.