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An automated, algorithm-based, lifestyle and diet personalization platform provides clinically significant improvements in metabolism related biomarkers, comparable to results achieved with medication or supervised nutrition counseling

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Background: Lifestyle choices, especially those related to diet and physical activity, prevent or delay the onset of many of the leading chronic diseases. Public health efforts have fallen short of their goals in reducing the risk of these diseases, perhaps because conventional approaches are focused on population-level interventions as opposed to those tailored to the individual.

Objective: To evaluate the efficacy of a web-based platform providing personalized nutrition recommendations generated using an algorithmic system on the improvement of blood biomarkers associated with metabolic diseases.

Methods: From January 2011 until July 2016, 734 individuals were enrolled in a personalized nutrition and feedback platform and completed baseline and follow-up testing. The mean age was 39.1 ± 11.0 years with 69% males and a mean body mass index of 25 ± 4.1 kg/m^2. The platform provided each subject with a plan of personalized nutrition recommendations based on serum biomarker profile and personal preferences. Fasting Blood Glucose (FBG), C-reactive protein (hsCRP), vitamin D, and lipid profiles were evaluated at baseline and follow-up, with median follow-up time of 288 days.

Results: Mean FBG, hsCRP, vitamin D, triglycerides, total cholesterol, LDL and HDL cholesterol were significantly improved from baseline to follow-up for subjects whose initial results were outside of normal ranges. For pre-diabetic subjects, the mean FBG dropped from 105.7 to 97.1 mg/dL (5.87 to 5.39 mmol/L) ($p < 0.001$) from baseline to follow-up.

Conclusions: This automated online platform is the first of its kind to demonstrate an association with clinically significant improvements in metabolism related serum biomarkers. Large scale application of personalized nutrition programs using algorithmic systems may be a useful addition to current approaches to the prevention of metabolic diseases.

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