Effects of a Personalized Dietary Intervention on Diet and Cardiometabolic Factors in Young Adults

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July 29, 2021



Background

- The high prevalence of obesity in US youth is positively correlated with cardiometabolic diseases (1).
- NHANES data shows that ethnic and racial minority groups are at increased risk for cardiometabolic diseases such as hypertension, diabetes, and myocardial infarction (1,2).
- Improving diet quality can alleviate the burden of cardiometabolic disorders.

Study Objective

To examine the effects of an 8-week personalized functional food dietary intervention on diet quality and cardiometabolic markers in young adults.

Methods

• Randomized, controlled, parallel-arm trial

Personalized Functional Food Diet (PD)

- n=8
- Personalized nutrition advice based on baseline phenotype
- Fruits, vegetables, and nuts provided
- Dietary counseling six times over the eightweek period

Conventional Dietary Advice (CD)

- n=11
- Non-personalized dietary counseling based on MyPlate guidelines
- Dietary counseling only at baseline visit

Experimental Design



Figure 1: Study design and outcome measures of complete study. BL: Baseline, W1: Week 1, W4: Week 4, W8: Week 8 (Clinical Trials ID: <u>NCT04635917</u>)

Inclusion and Exclusion Criteria

Inclusion criteria

- Age: 18–35 years of age
- BMI: 25-45 kg/m²
- Black including those of Hispanic ethnicity, and Non-Hispanic White individuals
- Willingness to consume study foods
- Willing to comply with study protocol
- Consistent diet and activity patterns for 4 weeks
- Weight stable (≤4 kg change over the last 3 months) (Self-reported)
- Non-smoker >1 year or more

Exclusion criteria

- Nuts, fruits, vegetable allergies
- Illicit drug use
- Recent start of medications that affect metabolism or appetite
- Anti-inflammatory medications and antibiotics
- Diabetes, hypertension, cardiovascular disorders, or dyslipidemia, requiring drug therapy
- Gastrointestinal disease and/or bariatric surgery
- HIV positivity
- Pregnant or lactating individuals

Baseline Characteristics of Participants

	BLACK FEMALES (N=7)	WHITE FEMALES (N=8)	BLACK MALES (N=1)	WHITE MALES (N=3)
Weight	86.48 ± 16.83	83.55 ± 16.04	105.1	92.9 ± 11.01
ВМІ	31.04 ± 6.2	32.43 ± 5.64	30.6	29.27 ± 2.3
Body fat %	37.82 ± 3.23	40.18 ± 2.92	33	31.35 ± 3.32
Waist circumference	85.43 ± 9.61	89.31 ± 9.61	98	93.17 ± 8.82
Fasting glucose	85 ± 2.97	85.12 ± 2.97	85	87.67 ± 8.08
Total cholesterol	164 ± 32.56	171.71 ± 35.26	214	172.5 ± 23.33
HDL	55.86 ± 10.71	53 ± 10.71	44	27.5 ± 2.12
LDL	81.57 ± 22.01	96.86 ± 22.01	156	116 ± 24.04
Trigycerides	131.71 ± 88.72	89.62 ± 88.72	68	145 ± 16.97
HbA1C	5.06 ± 0.28	4.95 ± 0.28	5.2	4.6 ± 0.35
RHI (endopat test)	2.02 ± 0.43	2.09 ± 0.43	2.46	1.96 ± 0.51
Diastolic	75.93 ± 5	82 ± 5	74	74.77 + 1.53
Systolic	115.93 ± 9.48	119.87 ± 9.48	132.5	130.67 ± 8.75

Means ± SD reported

The PD group had a significant improvement in HEI scores over the 8 weeks in comparison to the CD group (P<0.05)





HEI= Healthy eating index

The PD group's acceptance and palatability scores for most foods demonstrated a decreased trend over 8 weeks



W2= Week 2, W4= Week 4, W6=Week 6, W8=Week 8

The PD group showed greater improvements in body fat, fasting triglycerides, and diastolic blood pressure compared to the CD group



Conclusion

- Our preliminary data shows that personalizing a dietary intervention improved diet quality in all participants and there were trends for improvements in cardiometabolic factors compared to conventional dietary advice.
- Future analyses will include the complete dataset and explore the effects of the personalized dietary intervention on the gut microbiome.

References

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