



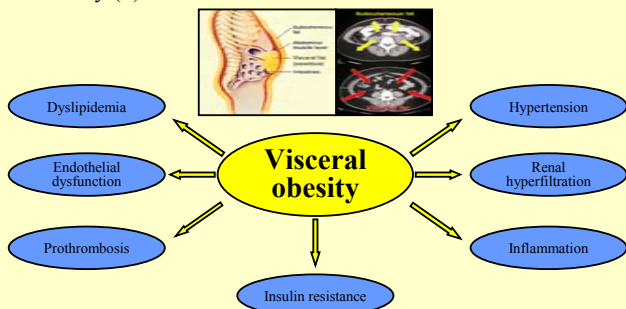
Relationships of dietary patterns with body composition in older adults differ by gender and PPAR- γ Pro12Ala genotype

Abstract

- Dietary patterns may better capture the multifaceted effects of diet on body composition than individual nutrients or foods.
- The goal of this study was to identify the dietary patterns of a cohort of older adults, and examine relationships with body composition. A polymorphism in the peroxisome proliferator-activated receptor- γ (PPAR- γ) gene was also considered.
- The Health, Aging and Body Composition (Health ABC) Study is a prospective cohort study of 3075 older adults. Body composition and genetic variation were measured in detail. Food intake was assessed with a food frequency questionnaire (FFQ), and dietary patterns of 1,809 participants with complete data were derived by cluster analysis.
- We identified six clusters, including a 'Healthy foods' cluster. Dietary pattern interacted with gender and PPAR- γ genotype in relation to body composition. While Pro/Pro homozygous men and women in the 'Healthy foods' cluster did not differ in adiposity from those in other clusters, men with the Ala allele had lower adiposity than those in other clusters.
- Relationships of diet and adiposity in older adults may differ by gender and by genetic factors such as PPAR- γ genotype.

Introduction

- While obesity is considered a major health risk, the regional distribution of body fat may be of greater consequence. Excess fat in the abdominal visceral area has been associated with higher risk of multiple metabolic complications and increased mortality (1).



- PPAR- γ is expressed in adipose tissue and regulates adipocyte differentiation and gene expression. A common polymorphism (Pro12Ala) in the PPAR- γ gene has been linked to greater adiposity in some studies, and effects of this polymorphism may depend on diet (2).

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Objective

- The purpose of this study was to identify the dietary patterns of a cohort of older adults, and examine relationships with body composition. We also considered the possible influence of variation in the PPAR- γ gene on these relationships.

Research Design

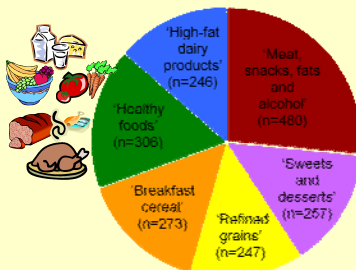


Health ABC cohort study
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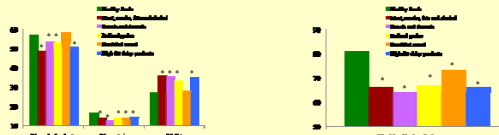
- Body composition was measured in Health ABC by CT scan, DEXA, and anthropometry. Food intake was assessed with a modified Block FFQ, and participants were genotyped by PCR for the Pro12Ala polymorphism of the PPAR- γ gene.
- In this study, dietary patterns were derived by cluster analysis. The 108 FFQ food items were aggregated into 40 food groups, and the percent energy contributed by each food group for each participant was entered in the cluster analysis.
- Multiple regression determined relationships of dietary patterns with body composition, controlled for possible confounding factors. Interactions of dietary pattern with gender and PPAR- γ genotype were found.

Results

- Six dietary pattern clusters were identified:



- Dietary characteristics of men (n=831); those of women (n=978) were similar.

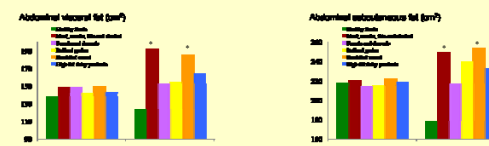
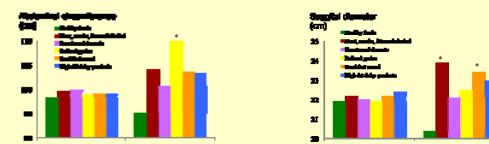
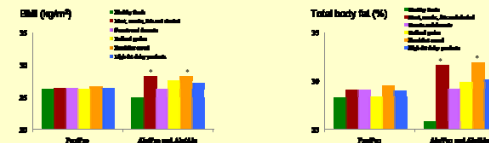


Percent energy contribution from selected food groups for the 6 dietary pattern clusters¹

Food group	Meat, snacks, fats and alcohol (n=480)	Sweets and desserts (n=257)	Refined grains (n=247)	Breakfast cereal (n=273)	Healthy foods (n=308)	High-fat dairy products (n=246)
Meat	4.0 ± 3.1	3.4 ± 2.7	3.5 ± 2.9	3.5 ± 3.1	2.8 ± 2.7	3.7 ± 3.4
Low-fat dairy products	1.0 ± 2.0	1.8 ± 3.0	1.6 ± 3.2	2.7 ± 3.9	9.4 ± 6.7	6.5 ± 1.4
Higher-fat dairy products	5.1 ± 2.9	6.2 ± 4.5	5.5 ± 3.9	6.3 ± 3.8	3.5 ± 2.8	16.7 ± 5.6
Beer	1.4 ± 4.5	0.3 ± 1.3	0.4 ± 2.3	0.5 ± 1.9	0.3 ± 1.4	0.4 ± 1.9
Fruit	4.0 ± 3.1	3.6 ± 3.0	3.9 ± 3.3	4.7 ± 3.8	8.2 ± 5.0	4.3 ± 3.7
Dark green vegetables	0.2 ± 0.3	0.2 ± 0.2	0.3 ± 0.3	0.2 ± 0.3	0.4 ± 0.5	0.3 ± 0.3
Other vegetables	1.1 ± 1.3	1.4 ± 1.2	1.3 ± 1.2	1.2 ± 1.1	1.4 ± 1.4	1.3 ± 1.4
Whole grains	3.2 ± 3.5	2.4 ± 2.8	2.1 ± 3.5	2.7 ± 3.0	5.8 ± 5.4	3.1 ± 3.8
Other cold breakfast cereal	4.5 ± 3.4	5.3 ± 4.2	4.1 ± 4.3	18.4 ± 6.3	6.7 ± 4.3	5.9 ± 4.2
Refined grains	10.7 ± 4.3	10.1 ± 5.4	25.3 ± 6.8	8.7 ± 4.7	9.5 ± 5.0	11.0 ± 4.9
Snacks	2.8 ± 5.1	2.1 ± 3.9	1.5 ± 2.6	1.4 ± 2.5	1.4 ± 2.9	1.7 ± 3.1
High-calorie drinks	4.8 ± 5.2	1.7 ± 3.0	2.7 ± 4.2	2.1 ± 3.5	0.8 ± 1.8	2.9 ± 4.9
Mayonnaise and salad dressing	4.9 ± 4.2	3.0 ± 2.7	2.9 ± 2.7	3.6 ± 3.2	3.0 ± 2.8	3.9 ± 3.2
Sweets and desserts	7.8 ± 4.7	36.2 ± 8.8	8.0 ± 5.5	7.2 ± 5.0	6.3 ± 4.7	6.7 ± 4.7
Miscellaneous fats	5.9 ± 4.5	4.0 ± 3.5	5.3 ± 4.1	3.8 ± 3.2	3.6 ± 3.5	4.6 ± 3.7

¹ Means ± SD. Clusters with the highest and lowest percent energy contributions from each food group are in bold.

- Pro/Pro homozygous men in the 'Healthy foods' cluster did not differ in adiposity from those in other clusters, while men with the Ala allele had lower adiposity than those in other clusters:



- Women of both genotype groups in the 'Healthy foods' cluster did not differ significantly in the above measures of adiposity from those in other clusters.

Conclusion

- Relationships of diet and adiposity in older adults may differ by gender and by genetic factors such as PPAR- γ genotype. Eventually dietary recommendations could be tailored to people with specific genotypes to minimize their health risks and promote their optimal health.

References

1. Adams KF, Schatzkin A, Harris TB et al. Overweight, obesity, and mortality in a large prospective cohort of persons 50 to 71 years old. *N Engl J Med*. 2006; Aug 24;355(8):763-78.
2. Lam J, Browne PO, Harding AH et al. Evidence for gene-nutrient interaction at the PPARgamma locus. *Diabetes*. 2001; Mar;50(3):686-9.