DIETARY ACID LOAD, KIDNEY FUNCTION, CHANGES IN BLOOD PRESSURE AND HYPERTENSION INCIDENCE IN COMMUNITY-DWELLING ELDERLY MEN

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INTRODUCTION

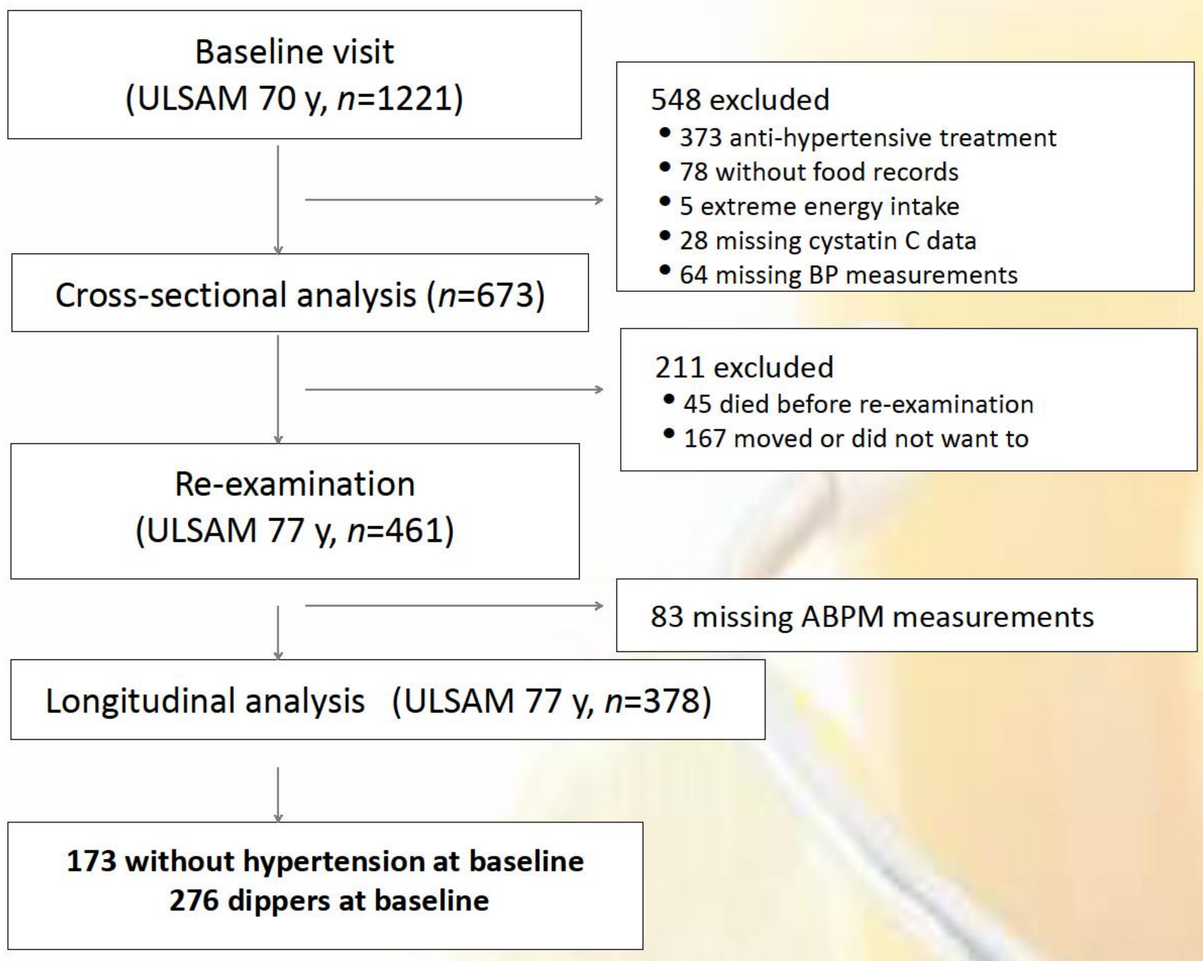
Dietary acid load affects acid-base homeostasis, which may link to blood pressure (BP). Previous research on dietary acid load and BP in the community has provided conflicting results, which may be confounded by underlying kidney function with inability to eliminate acid excess.

OBJECTIVE

Aim: To investigate longitudinal associations between dietary acid load and changes in BP in community-based elderly men in the Uppsala Longitudinal Study of Adult Men (ULSAM).

SUBJECTS AND METHODS

Study population



Dietary records

Dietary habits were assessed by a 7-d dietary record based on a validated pre-coded menu book by the Swedish National Food Administration (NFA).

Dietary acid load

Two established algorithms were utilized to evaluate dietary acid load from nutrient intake:

PRAL (mEq/d) = 0.49 x protein intake (g/d) + 0.037 x phosphorus (mg/d) - 0.021 x potassium (mg/d) - 0.013 x calcium (mg/d) - 0.026 x magnesium (mg/d)

NEAP (mEq/d) = (54.4 x protein intake (g/d)/potassium (mEq/d)) - 10.2

Ambulatory blood pressure monitoring (ABPM)

Performed at baseline and re-examination.

Hypertension was defined as 24-hour SBP ≥ 130 mmHg, 24-hour DBP ≥ 80 mmHg or use of anti-hypertensive medications.

Nondipping was defined as a ratio of night-time/daytime SBP > 0.9.

RESULTS

General characteristics

Across increasing PRAL tertiles, individuals had higher consumption of energy, protein, phosphorus, calcium, potassium, magnesium and sodium.

There were no trends across PRAL tertiles regarding age, BMI, smoking status, alcohol intake, physical activity levels, education levels, CVD, diabetes, hyperlipidemia, eGFR, CKD or hypertension.

We did not observe linear trends across PRAL tertiles and ABPM-derived parameters.

Cross-sectional analysis

Dependent variables	SC	*p* values
24-hour SBP	0.08	0.06
24-hour DBP	0.10	0.02
24-hour PP	0.04	0.37
Daytime SBP	0.08	0.07
Night-time SBP	0.08	0.07
Night/day- time SBP ratio	0.03	0.55

Longitudinal analysis

At re-examination, PRAL did not predict ABPM changes (all p >0.05)

Association between PRAL and incidence of hypertension or nondipping

	All subjects OR (95% CI)	eGFR<60 mL/min/1.73 m² OR (95% CI)	eGFR≥60 mL/min/1.73 m² OR (95% CI)	Interaction
Incidence hypertension				
Cases/total (n)	**82/173**	**31/64**	**51/109**	
PRAL (per mEq/d higher)	0.99 (0.91-1.04)	0.97 (0.91-1.04)	1.01 (0.95-1.06)	0.49
Incidence non-dipper				
Cases/total (n)	**152/276**	**53/94**	**99/182**	
PRAL (per mEq/d higher)	1.01 (0.97, 1.04)	1.04 (0.89-1.05)	0.99 (0.96, 1.03)	0.57

Similar findings were obtained when using NEAP as the exposure

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CONCLUSIONS

These results in a cohort of community-dwelling elderly men do not support an association between estimated dietary acid load and changes in ABPM or hypertension incidence.

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