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Lower estimates of net endogenous non-carbonic acid production are positively associated with indexes of bone health in premenopausal and perimenopausal women.

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BACKGROUND:

The link between acid-base homeostasis and skeletal integrity has gained increasing prominence in the literature. Estimation of the net rate of endogenous non-carbonic acid production (NEAP) from dietary protein and potassium content enables exploration of the effects of dietary acidity or alkalinity on bone.

OBJECTIVE:

The study aimed to ascertain whether lower dietary acidity (lower dietary protein intake but higher potassium intake-ie, low estimate of NEAP) was associated with greater axial and peripheral bone mass and less bone turnover, independent of key confounding factors.

DESIGN:

Baseline (cross-sectional) results of a population-based study were examined further. The database includes spine and hip bone mineral density (BMD) in 1056 premenopausal or perimenopausal women aged 45-54 y and forearm bone mass and the urinary markers of bone resorption in 62 women. A validated food-frequency questionnaire was used to measure dietary intakes.

RESULTS:

Lower estimates of energy-adjusted NEAP were correlated with greater spine and hip BMD and greater forearm bone mass ($P < 0.02$ to $P < 0.05$). Hip and forearm bone mass decreased significantly across increasing quartiles of energy-adjusted NEAP ($P < 0.02$ to $P < 0.03$), and trends at the spine were similar ($P < 0.09$). Differences remained significant after adjustment for age, weight, height, and menstrual status. Lower estimates of energy-adjusted NEAP were also correlated with lower excretion of deoxypyridinoline and were significant predictors of spine and forearm bone mass.

CONCLUSIONS:

These novel findings provide evidence of a positive link between a ratio of lower protein to higher potassium dietary intake (ie, less dietary acid) and skeletal integrity.