Article

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Renal and dietary factors associated with hypertension in a setting of disadvantage in rural India

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Abstract

Using a case-control design, we determined risk factors associated with hypertension in a disadvantaged rural population in southern India. Three hundred adults with hypertension and 300 age- and sex-matched controls were extensively phenotyped. Underweight (29%, body mass index < 18.0 kg m−2), chronic kidney disease (25%, estimated glomerular filtration rate <60 ml min−1 1.73 m−2) and anemia (82%) were highly prevalent. The ratio of sodium to potassium excretion was high (8.2). In multivariable conditional logistic regression of continuous variables dichotomized by their median value, hypertension was independently associated with greater abdominal adiposity as assessed by waist–hip ratio [odds ratio (95% confidence interval), 1.89 (1.21–2.97)], lesser protein intake as assessed by 24 h urea excretion [0.39 (0.24–0.65)], and lesser plasma renin activity [0.54 (0.35–0.84)]. Hypertension tended to be independently associated with lesser serum potassium concentration [0.66 (0.44–1.01), P = 0.06]. Furthermore, those with hypertension reported less frequent intake of vegetables and urinary sodium–potassium ratio correlated positively with serum sodium–potassium ratio (r = 0.18). Hypertension was also independently associated with lesser blood hemoglobin concentration [0.48 (0.26–0.88)]. Blood hemoglobin concentration was positively associated with serum iron (r = 0.41) and ferritin (r = 0.25) concentration and negatively associated with total iron binding capacity (r = −0.17), reflecting iron-deficiency anemia. Our findings indicate potential roles for deficient intake of potassium and protein, and iron-deficiency anemia, in the pathophysiology of hypertension in a setting of disadvantage in rural India. Imbalanced intake of potassium and sodium may be driven partly by deficient intake of vegetables or fruit.

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