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Increased body mass index above the upper normal limit is significantly associated with renal dysfunction among community-dwelling persons

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Abstract

Purpose Body mass index (BMI) is a simple index of weight-to-height that is commonly used to classify people as underweight, overweight or obesity, and high BMI has been clearly linked to increased risk of illness in adults. However, few studies have examined the significance of upper normal weight as a risk factor for the development of chronic kidney disease (CKD) in the general Japanese population.

Methods We conducted a prospective cohort study designed as part of the Nomura study. We recruited a random sample of 421 men aged 67 ± 10 (mean ± standard deviation; range 24–95) years and 565 women aged 68 ± 9 (22–84) years during their annual health examination in a single community. We examined the relationship between quartiles of baseline BMI and renal dysfunction after a 3-year evaluation based on estimated glomerular filtration rate (eGFR) using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equations modified by the Japanese coefficient. CKD was defined as having dipstick-positive proteinuria (≥ 1 +) or a low eGFR (< 60 mL/min/1.73 m^2).

Results Of the 986 participants, a total of 134 (13.6%) participants, including 72 (17.1%) men and 62 (11.0%) women, received a new diagnosis of CKD during the study period, and 25 (9.7%), 19 (8.0%), 47 (19.0%), and 43 (17.8%) diagnoses were received in the BMI-1 (BMI, < 20.7 kg/m^2), BMI-2 (BMI, 20.7 to 22.5 kg/m^2), BMI-3 (BMI, 22.6 to 24.4 kg/m^2), and BMI-4 (BMI ≥ 24.5 kg/m^2) groups, respectively. Using BMI-2 as the reference group, the non-adjusted odds ratio (OR) (95% confidence interval) for CKD was 2.70 (1.53–4.75) for BMI-3 and 2.49 (1.40–4.42) for BMI-4, and the multivariable-adjusted OR was 2.52 (1.40–4.56) for BMI-3 and 2.30 (1.26–4.22) for BMI-4.

Conclusions Increased BMI from upper normal weight is strongly associated with the development of CKD in community-dwelling persons.

Keywords Body mass index · Risk factor · Renal function · eGFR · CKD

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