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The association between chronic kidney disease and obese population with or without metabolic disturbances: a population based study

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Objectives : The aim of the present study using representative in the general Korean population was to evaluate the association between CKD and obese participants with or without metabolic abnormalities.

Methods : Data from the Korean National Health and Nutrition Examination Survey (KNHANES) 2009-2013 were used for the analyses. The total number of participants in KNHANES was 44,085. Those who were body mass index (BMI) < 18.5 kg/m2, were older than 80 years of age, or were younger than 18 years of age were excluded. As a result, 21,493 participants were included in this study. Participants were divided into 4 groups: metabolically healthy non-obesity (MHNO), metabolically healthy obesity (MHO), metabolically unhealthy non-obesity (MUNO), metabolically unhealthy obesity (MUO).

Results : The number of participants allocated to the MHNO, MHO, MUNO, and MUO groups was 2,943, 216, 9,244, and 6,899, respectively. The eGFR in MHNO, MHO, MUNO, and MUO groups was 94.8 ± 0.3, 92.4 ± 1.0, 90.3 ± 0.2, and 89.0 ± 0.2 mL/min/1.73 m2, respectively. Univariate analysis revealed that the eGFR was lowest in MUO group than the other groups. Multivariate analysis revealed that the eGFR in MHNO, MHO, MUNO, and MUO groups was 91.6 ± 0.3, 89.7 ± 1.1, 91.8 ± 0.2, and 89.6 ± 0.3 mL/min/1.73 m2, respectively. The eGFR in MUO group was lower than in that in the MHNO or MUNO groups. There was no significant difference in eGFR between MHO and MUO groups. The prevalence rate of CKD in MHNO, MHO, MUNO, and MUO groups was 0.7 ± 0.2%, 0.9 ± 0.5%, 4.2 ± 0.2%, and 6.0 ± 0.4%, respectively ($P < 0.001$). Univariate and multivariate logistic regression analyses showed that the MUO group had increased risk of CKD compared with the other groups. The MUNO group had increased risk of CKD compared with the MHNO group.

Conclusions : MUO was associated with the highest risk of CKD among four groups. There were no significant differences in prevalence rate of CKD or eGFR among MHNO, MUNO, and MHO groups.

Keywords : obesity, metabolic syndrome, chronic kidney disease