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Unveiling the association between non-alcoholic fatty liver disease and chronic kidney disease: Insights from NHANES 1999-2016

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Objectives : Although non-alcoholic fatty liver disease (NAFLD) increases the risk of kidney dysfunction genetically, the clinical association in different conditions has not been evaluated yet. Herein, we aimed to evaluate the association between NAFLD and chronic kidney disease (CKD) using a fatty liver index (FLI), a useful non-invasive method for assessing the status of NAFLD.
Methods : This study utilized data from the National Health and Nutrition Examination Survey (NHANES) 1999-2016. The participants were categorized into FLI quartiles, with the 1st quartile serving as the reference group. CKD was defined based on the estimated glomerular filtration rates (eGFR) <60 mL/min/1.73 m^2. To evaluate the risk of CKD, we performed multivariate logistic regression model adjusted with age, sex, ethnicity, education, alcohol consumption, smoking status, comorbidities, laboratory parameters, and total calorie intake.
Results : Among 51,688 participants, 9.4% (n=4,843) were defined with CKD. The 4th quartile of FLI significantly increased the risk of CKD with 1.81 times than 1st quartile, and it was maintained after adjustment with such variables (adjusted odds ratio [aOR] 1.35, 95% CI 1.18-1.55). In the subgroup analysis, the significance of FLI was prominent in age ≥60 (aOR 1.38, 95% CI 1.19-1.61). The impact of the highest quartile of FLI was maintained irrespective of sex. In comparing the participants according to the presence of comorbidities, the significance of 4th quartile of FLI was maintained in participants without hypertension (aOR 1.47, 95% CI 1.15-1.87), without diabetes (aOR 1.42, 95% CI 1.21-1.66), or without dyslipidemia (aOR 1.50, 95% CI 1.24-1.82).
Conclusions : NAFLD representing with higher FLI is significantly associated with the risk of incident CKD. The association between FLI and CKD was more prominent in elderly population and without comorbidities such as hypertension, diabetes, or dyslipidemia. FLI could be applied in specific populations as a good predictor of CKD.