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Trajectory Analysis in FBG and the Incidence of Chronic Kidney Disease: A Nationwide Population-Based Study

Heewon Park[1], Ki Ryang Na[2], Hyerim Park[4], Yunkyeong Hwang[5], Suyeon Han[5], Eu Jin Lee[2], Young Rok Ham[2], Soon-Ki Ahn[3], Dae Eun Choi[4]
[1]Department of Internal Medicine-Nephrology, Chungnam National University Sejong Hospital, Korea, Republic of
[2]Department of Internal Medicine-Nephrology, Chungnam National University Hospital, Korea, Republic of
[3]Department of Preventive Medicine, Chungnam National University Hospital, Korea, Republic of
[4]Department of Department of Medical Science, Chungnam National University, Korea, Republic of
[5]Department of Internal Medicine-Nephrology, The Catholic University of Korea Daejeon St. Mary's Hospital , Korea, Republic of

Objectives : This study examines the association between fasting blood glucose (FBG) trajectories and chronic kidney disease (CKD) incidence in non-diabetic individuals, using Korean National Health Insurance Service data. It also explores sex-based differences in this relationship to enhance early risk stratification and targeted interventions.
Methods : Using data from the National Health Insurance Service-National Sample Cohort in Korea, participants aged 40 years and above, without CKD or diabetes mellitus (DM), were followed from 2002 to 2009. Based on their FBG trajectories, participants were categorized into two classes and stratified by sex. CKD incidence rates were analyzed according to these FBG trajectories, and the impact of additional risk factors on CKD incidence was assessed.
Results : A total of 91,131 participants were analyzed. Among individuals classified in Class 1, FBG levels gradually increased from 90.7 (men) and 88.7 (women) in 2002 to 96.6 (men) and 93.2 (women) in 2009. In contrast, participants classified as Class 2 exhibited a rapid increase in FBG levels, rising from 106 (men) and 106 (women) in 2002 to 144 (men) and 132 (women) in 2009. The incidence of CKD increased over time in both men and women classified as Class 2 compared to Class 1, with respective hazard ratios (HR) of 1.35 for men and 1.53 for women. Additionally, increased age, hypertension, and body mass index (BMI) were independently associated with an elevated risk of CKD.
Conclusions : The Class 2 group demonstrated a significantly higher incidence of CKD compared to the Class 1 group. This finding indicates the need for the proactive management of individuals with relatively high FBG levels featuring rapid FBG increases in order to mitigate the risk of CKD development.

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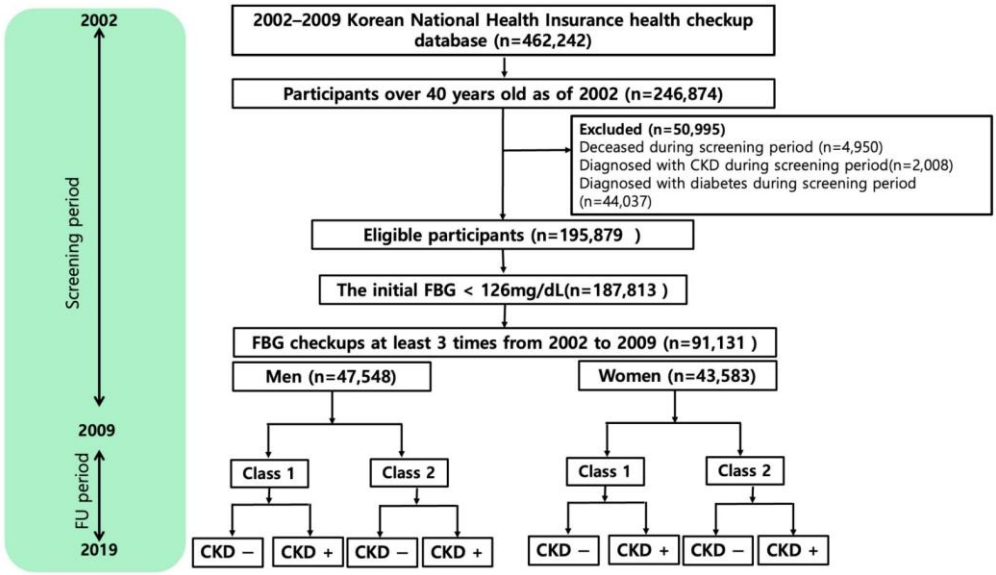

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