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Midterm eGFR and Adverse Pregnancy Outcomes: The Clinical Significance of Gestational Hyperfiltration

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Abstract

Background and objectives Although hemodynamic adaptation plays a crucial role in maintaining gestation, the clinical significance of midterm renal hyperfiltration (MRH) on pregnancy outcomes is unknown.

Design, setting, participants, & measurements This was an observational cohort study. Women with a singleton pregnancy and a serum creatinine measurement during their second trimester were followed at two university hospitals in Korea between 2001 and 2015. Those with substantial renal function impairment or who delivered during the second trimester were not considered. MRH was represented by the highest eGFR, which was calculated using the Chronic Kidney Disease Epidemiology Collaboration method. An adverse pregnancy event was defined by the composition of preterm birth (gestational age <37 weeks), low birth weight (<2.5 kg), and preeclampsia.

Results Data from 1931 pregnancies were included. The relationship between midterm eGFR and adverse pregnancy outcomes, which occurred in 538 mothers, was defined by a nonlinear U-shaped curve. The adjusted odds ratio and associated 95% confidence interval (95% CI) of an adverse pregnancy outcome for eGFR levels below and above the reference level of 120–150 ml/min per 1.73 m² were 1.97 (95% CI, 1.34 to 2.89; *P*<0.001) for ≥150 ml/min per 1.73 m²; 1.57 (95% CI, 1.23 to 2.00; *P*<0.001) for 90–120 ml/min per 1.73 m²; and 4.93 (95% CI, 1.97 to 12.31; *P*<0.001) for 60–90 ml/min per 1.73 m². Moreover, among mothers without baseline CKD, women with adverse pregnancy outcomes had less prominent MRH than those without (*P*<0.001).

Conclusions We identified a unique U-shaped relationship between midterm eGFR and adverse pregnancy outcomes, and the optimal range of midterm eGFR levels was 120–150 ml/min per 1.73 m². In those without evident functional renal impairment, the absence of prominent MRH might be a significant risk factor for poor pregnancy outcomes.

Hyperfiltration pregnancy chronic kidney disease Cohort Studies
Confidence Intervals creatinine Female Gestational Age
glomerular filtration rate Hemodynamics Humans
Infant, Low Birth Weight Infant, Newborn kidney Mothers
Odds Ratio Pre-Eclampsia Pregnancy Pregnancy Outcome
Pregnancy Trimester, Second Premature Birth Renal Insufficiency
Renal Insufficiency, Chronic risk factors

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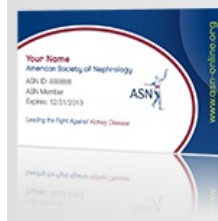
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