

## KSN 2017 Abstract

KSN-17-O087

### Estimated glomerular filtration during gestation predicts maternal and fetal complications

Sehoon PARK<sup>1</sup>, Joon-seok HONG<sup>3</sup>, Seung mi LEE<sup>3</sup>, Joong-shin PARK<sup>3</sup>, Ho jun CHIN<sup>4</sup>, Ki young NA<sup>4</sup>, Dong ki KIM<sup>2</sup>, Kook-hwan OH<sup>2</sup>, Kwon wook JOO<sup>2</sup>, Yon su KIM<sup>1,2</sup>, \*Hajeong LEE<sup>2</sup>

<sup>1</sup>Department of Biomedical Sciences, Seoul National University Hospital, Seoul National University College of Medicine, Korea, South, <sup>2</sup>Department of Internal Medicine, Seoul National University Hospital, Korea, South, <sup>3</sup>Department of Obstetrics and Gynecology, Seoul National University Hospital, Korea, South, <sup>4</sup>Department of Internal Medicine, Seoul National University Bundang Hospital, Korea, South

**Objectives :** Stable renal function has been considered as an important clinical factor for maintaining safe pregnancy. However, comprehensive analysis of kidney function parameter during gestation and its association with pregnancy outcomes was yet to be performed.

**Methods :** This study included pregnancy cases in two tertiary teaching hospitals in Korea from 2001 to 2015. We collected all available estimated glomerular filtration rate (eGFR), estimated by CKD-EPI method, during pregnancy and calculated time-averaged eGFR during pregnancy considering the value as a time-dependent variable. Mothers were divided into four groups as follows: eGFR 60–90, 90–120, 120–150, and  $\geq 150$  ml/min/1.73m<sup>2</sup>. Adverse pregnancy outcome was composition of preterm birth, low birth weight and preeclampsia. Analyses were performed with multivariable logistic regression test and calculated area-under-curve (AUC) of receiver operating characteristics (ROC) curve using the eGFR during gestation as an explanatory variable.

**Results :** A total of 12,900 mothers were included in the study. The collected mothers median age and time-averaged eGFR during gestation was 33 (30–35) years and 127.3 (120.6–134.0) mL/min/1.73m<sup>2</sup>, respectively. Those in the subgroups with the highest and the lowest eGFR were relatively younger than the others.. Overall prevalence of history of hypertension was 9.1%, and significant amount of albuminuria was identified in 929 (7.2 %) mothers, both which were most common in those with eGFR level of 60–90 mL/min/1.73m<sup>2</sup>. Regarding the prognosis, total number of 4,028 mothers experienced composite adverse pregnancy outcomes, and there were 3,407 preterm birth, 2,397 low birth weight, and 749 preeclampsia events identified in the study

## **KSN 2017 Abstract**

cohort. Surprisingly, those with lowest or highest eGFR during gestation had most frequent pregnancy complications. The adjusted odds ratio (aOR) and associated 95% confidence interval of an adverse pregnancy outcome for eGFR levels below and above the reference level of 120–150 mL/min/1.73 m<sup>2</sup> were as follows:  $\geq 150$  mL/min/1.73 m<sup>2</sup>, aOR 1.86 (1.56–2.22),  $P < 0.001$ ; 90–120 mL/min/1.73 m<sup>2</sup>, aOR 1.18 (1.06–1.31),  $P = 0.003$ ; and 60–90 mL/min/1.73 m<sup>2</sup>, aOR 1.72 (1.12–2.65),  $P = 0.014$ . When eGFR in each trimester was separately assessed, second trimester eGFR, which was available in 2,538 mothers, was more significantly associated with gestational outcomes when compared with first trimester and third trimester eGFR which were available in 1,449 and 11,008 mothers each. Moreover, among those with complete information of weight change during gestation, estimated ROC curve of the multivariable model including risk stratification by eGFR group during gestation showed significantly higher AUC than the model without information of eGFR [0.733 (0.717–0.740) .vs 0.728 (0.722–0.744),  $P = 0.006$ ].

**Conclusions :** In this study, we demonstrated a non-linear, U-shaped relationship between eGFR during gestation and the risk of adverse pregnancy outcome. Also, information of eGFR during pregnancy increased the accuracy of predictive model for pregnancy complications. Clinicians might consider measuring the renal function parameter during gestation, particularly in midterm as the association between pregnancy outcomes and eGFR was most prominently shown in the second trimester.

**Keywords :** Pregnancy, estimated glomerular filtration rate, Preterm birth, Low birth weight, Preeclampsia