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Association between increased number of births and kidney dysfunction

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Objectives: Pregnancy can change hemodynamics of renal blood flow and increase glomerular filtration rate (GFR). However, it is not known whether multiple pregnancies can affect kidney function later in life. Thus, this study aimed to examine the association between the number of childbirth and kidney function.

Methods: In this cross-sectional study, we analyzed a total of 101,331 women aged 40 to 79 who were enrolled in the Korean Genome and Epidemiology Study Health Examinee (KoGES-HEXA) from 2004 to 2012. Subjects were categorized into six groups according to their number of childbirth. Multivariable logistic regression model was constructed to determine the association between parity and a composite of an estimated GFR < 60 mL/min/1.73 m^2 or a dipstick proteinuria ≥ 1+.

Results: There were 1,199 (1.2%), 10,285 (10.1%), 57,196 (56.4%), 22,404 (22.1%), 6,872 (6.8%), and 3,375 (3.3%) women who delivered 0, 1, 2, 3, 4, and ≥5 children, respectively. Women with higher parity were older and had higher prevalence of hypertension and diabetes. In addition, these women had experienced more menopause and the duration of their menstruation was longer than that of women with lower parity. After adjustment for age, body mass index, duration of menstruation, comorbidities, socioeconomic status, and laboratory findings, women with five or more deliveries were associated with a 1.67-fold higher odds of a composite of decreased kidney function or proteinuria compared with women who never delivered (OR, 1.67; 95% CI, 1.08-2.57; P=0.021). This association was more prominent in postmenopausal women but not in premenopausal women. There was no significant difference in the odds of kidney impairment among women with less than 4 deliveries.

Conclusions: Women with five or more childbirth deliveries are more likely to have lower kidney function or proteinuria.

Table 1. Odds ratios for a composite of decreased kidney function or proteinuria according to parity

Table 3. Odds ratios for a composite of decreased kidney function or proteinuria according to parity

Parity	Model 1		Model 2		Model 3		Model 4	
	ORs (95% CI)	*p*	ORs (95% CI)	*p*	ORs (95% CI)	*p*	ORs (95% CI)	*p*
0	Reference		Reference		Reference		Reference	
1	0.97 (0.69-1.36)	0.848	1.00 (0.70-1.43)	0.993	1.09 (0.73-1.61)	0.683	1.04 (0.69-1.58)	0.855
2	0.94 (0.68-1.30)	0.714	0.97 (0.69-1.37)	0.868	1.08 (0.74-1.58)	0.677	1.07 (0.72-1.60)	0.738
3	1.37 (0.99-1.90)	0.058	1.00 (0.71-1.42)	0.978	1.07 (0.73-1.57)	0.722	1.06 (0.71-1.59)	0.781
4	1.98 (1.42-2.76)	<0.001	1.17 (0.82-1.67)	0.386	1.27 (0.85-1.88)	0.244	1.22 (0.80-1.87)	0.346
≥ 5	3.15 (2.24-4.42)	<0.001	1.60 (1.11-2.30)	0.012	1.67 (1.11-2.51)	0.015	1.67 (1.08-2.57)	0.021

Abbreviations: ORs, odds ratios; CI, confidence interval

Model 1: Unadjusted

Model 2: Adjusted for age, body mass index, and duration of menstruation

Model 3: Model 2 + hypertension, diabetes, education, income, smoking, and alcohol

Model 4: Model 3 + serum albumin, total cholesterol, and high-sensitivity C-reactive protein

Figure 1. Odds ratios for a composite of decreased kidney function or proteinuria by menopausal status