Associations of working pattern during pregnancy with small for gestational age and preterm births

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OBJECTIVE

The purpose of this study was to research the associations of shift work and night shift status during pregnancy on small for gestational age (SGA) and preterm births in the Korean population.

METHODS

The Korean CHildren's ENvironmental health Study (Ko-CHENS) is a nationwide prospective birth cohort for the children's environmental diseases by the Ministry of Environment and the National Institute of Environmental Research. This study included pregnant women recruited from 2015 to 2020 for Ko-CHENS Core Cohorts, and 4,944 out of a total of 5,213 pregnant women were selected as final subjects. A logistic regression model was used to identify risk factors affecting small for gestational age (SGA) births, preterm births and low birth weight infants, and odds ratio was adjusted. It was confirmed by the calculated odds ratio. As adjusted variables, age, sex of infant, maternal education, body mass index (BMI), smoking status, drinking alcohol, number of previous births, gestational diabetes mellitus (GDM), pre-eclampsia, and abortion history were used.

RESULTS

There were no statistically significant differences between birth outcomes and maternal working pattern. There were no significant differences in adjusted odds ratios (aORs) of SGA and preterm births compared to the non-workers group (Group A), workers without shift work group (Group B), and shift workers group (Group C). However, there was significant difference in aORs of SGA compared to non-workers, day workers, shift workers and night shift workers. (Non-workers vs. day workers vs. shift workers vs. night shift workers, aORs[95% CI]: 1.000 vs. 1.061[0.871-1.293] vs. 0.996[0.677-1.466] vs. 2.437[1.103-5.382]).

Table 1. Adjusted odds ratios (aORs) for the association between birth outcome and maternal working pattern

Variables	Working pattern		
	Non-workers	Worker without shift work	Shift worker
SGA	1.000 (Reference)	1.065 (0.874-1.297)	1.129 (0.791-1.612)
Preterm birth	1.000 (Reference)	0.785 (0.596-1.035)	0.557 (0.293-1.058)

* SGA, Small for gestational age
* SGA : Adjusted Job, working pattern, maternal age, infant sex, education, BMI, smoking, drinking, parity, gestational diabetes, pre-eclampsia, abortion, preterm birth
* Preterm birth : Adjusted Job, working pattern, maternal age, infant sex, education, BMI, smoking, drinking, parity, gestational diabetes, pre-eclampsia, abortion

Table 2. Adjusted odds ratios (aORs) for the association between small for gestational age (SGA) and maternal work

Variables	SGA	
	Model1 OR (95% CI)	Model2 OR (95% CI)
Maternal working status		
Non-worker	1.000 (Reference)	1.000(Reference)
worker	1.074 (0.885-1.304)	1.072(0.883-1.301)
Working pattern		
Non-worker	1.000(Reference)	1.000(Reference)
Day work	1.064(0.874-1.296)	1.061(0.871-1.293)
Shift work	1.002(0.681-1.474)	0.996(0.677-1.466)
Night shift	**2.431**(1.101-5.367)	**2.437**(1.103-5.382)

* SGA, Small for gestational age
* Model1 : Adjusted Job, working pattern, maternal age, infant sex, education, BMI, smoking, drinking, parity, gestational diabetes, pre-eclampsia, abortion
* Model2 : Adjusted Job, working pattern, maternal age, infant sex, education, BMI, smoking, drinking, parity, gestational diabetes, pre-eclampsia, abortion, preterm birth

CONCLUSION

Working during pregnancy did not increase the risk of SGA and preterm births, and night shift working did not increase the risk of preterm births. However, night shift working associated increasing the risk of SGA.