Optimal Pre-Pregnancy Body Mass Index Cut-Offs for Obesity in Japan

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To the Editor

Based on our earlier studies in Japan [1, 2], we understand that we need to be more tolerant for the gestational weight gain in Japanese woman than ever, especially in overweight women. However, we have not well examined the influence of the maternal pre-pregnancy physique on the perinatal outcomes in the overweight and/or obesity women in Japan.

To date, some pre-pregnancy body mass indexes (BMIs; kg/m^2) cut-offs have been examined to predict the high risk BMI levels as obesity associated with the adverse perinatal outcomes [3-5]. For example, in Japan, the Japanese Ministry of Health, Labour and Welfare (JMHLW) guideline has defined pre-pregnancy BMI of ≥ 25 as obesity [3], while the Institute of Medicine (IOM) guideline in the USA has defined pre-pregnancy BMI of ≥ 30 as obesity associated with the increased risk of both neonatal macrosomia and cesarean delivery [4]. In 2004, in addition, the World Health Organization (WHO) recommended the classification of pre-pregnancy BMI of ≥ 27.5 as obesity in Asian populations [5]. To (re-)assess the optimal pre-pregnancy BMI cut-offs for obesity in Japanese women associated with the perinatal outcomes, we examined the perinatal outcomes in Japanese singleton pregnancy of pre-pregnancy BMI 25.0 - 27.4, 27.5 - 29.9 and ≥ 30.0 compared with that of BMI 18.5 - 24.9 as control.

The protocol for this study was approved by the Ethics Committee of the Japanese Red Cross Katsushika Maternity Hospital. Informed consent concerning analysis from a retrospective database was obtained from all subjects.

We reviewed the obstetric records of singleton pregnant Japanese women who delivered at our institute at ≥ 22 weeks' gestation from April 2012 through November 2016. Data were expressed as mean ± standard deviation or number (percentages). Cases and controls were compared by means of Student's t-test for continuous variables, and the X^2 or Fisher's exact test for categorical variables. Differences with $P < 0.05$ were considered significant.

Table 1 shows the clinical description and perinatal outcomes in Japanese singleton pregnancies based on the maternal pre-pregnancy BMI cut-offs for obesity according to the JMHLW, WHO Asian and IOM BMI guidelines. There were no significant differences in the clinical description such as maternal age, parity or maternal height among the four groups. To predict the incidence of maternal impaired glucose tolerance in Japanese pregnant women, the Japanese (JMHLW BMI) cut-off seemed to better than the other two cut-offs; however, to predict the incidence of other complications such as maternal hypertensive disorders, cesarean delivery and neonatal macrosomia, the other cut-offs seemed to be better than the Japanese cut-off. Based on the current observation, we may be also required to be more tolerant for the maternal pre-pregnancy physique than ever, especially in overweight women of BMI 25 - 27.4. To confirm these, a larger study is needed.

References

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Table 1. Clinical Description and Perinatal Outcomes in Japanese Singleton Pregnancies Delivered at ≥ 22 Weeks' Gestation Based on the Maternal Pre-Pregnancy BMI Cut-Offs for Obesity According to the JMHLW, the WHO Asian and the IOM BMI Guidelines

Pre-pregnancy BMI	Control	Obesity of JMHLW	Obesity of WHO	Obesity of IOM
BMI	18.5 - 24.9	25.0 - 27.4	27.5 - 29.9	≥ 30.0
Number	3,785	225	151	110
Average	21.1 ± 1.5	26.4 ± 0.6	28.7 ± 0.8	33.0 ± 2.4
Maternal height (cm)	159 ± 5.3	157 ± 5.9	158 ± 5.0	158 ± 6.6
Body weight at pre-pregnancy (kg)	52.9 ± 5.1	65.3 ± 5.2*	72.5 ± 5.0*	82.5 ± 8.5*
Body weight at delivery (kg)	63.5 ± 6.5	756 ± 7.7*	80.8 ± 7.1*	87.6 ± 9.2*
Gestational weight gain (kg)	10.3 ± 5.7	10.3 ± 4.7	7.1 ± 5.6	5.0 ± 5.0*
Maternal age (years)	32.7 ± 5.6	32.7 ± 6.0	32.7 ± 6.0	31.9 ± 5.0
< 20 years	80 (2.1%)	4 (1.2%)	2 (1.3%)	0 (0%)
≥ 35 years	1,338 (35.3%)	75 (23.1%)	57 (31.7%)	29 (26.4%)
Nulliparity	1,838 (48.0%)	96 (43.7%)	61 (40.4%)	57 (51.8%)
Hypertensive disorders	310 (8.2%)	25 (11.1%)	23 (15.2%)*	25 (22.7%)*
Impaired glucose tolerance	82 (2.2%)	12 (5.3%)*	11 (7.3%)*	17 (15.5%)*
Preterm delivery	249 (8.6%)	14 (6.2%)	8 (5.3%)	6 (6.5%)
Cesarean delivery	538 (14.2%)	35 (15.6%)	18 (11.9%)	36 (32.7%)*
Neonatal birth weight (g)	2,990 ± 441	3,081 ± 446	3,148 ± 411*	3,246 ± 399*
< 2,500g	399 (10.5%)	18 (8.0%)	6 (4.0%)*	2 (1.3%)*
≥ 4,000g	28 (0.7%)	4 (1.8%)	6 (4.0%)*	5 (6.5%)*
Postpartum hemorrhage ≥ 1,000 mL	356 (9.4%)	28 (12.4%)	21 (13.9%)	15 (9.9%)

Data are expressed as mean ± standard deviation or number (percentages). *P < 0.01 vs. control. BMI: body mass index; JMHLW: Japanese Ministry of Health, Labour and Welfare; WHO: World Health Organization; IOM: the Institute of Medicine.