

Habitual Alcohol Consumption during Pregnancy and Perinatal Outcomes

Mariko Ikeda and Shunji Suzuki

Department of Obstetrics and Gynecology, Japanese Red Cross Katsushika Maternity Hospital

We investigated perinatal outcomes in pregnant Japanese women who habitually consumed alcohol during pregnancies managed at our hospital. Of the 4,791 Japanese women with singleton deliveries at ≥ 22 weeks' gestation, 44 (0.9%) were found to have habitually consumed alcohol during pregnancy. Multiple logistic regression analyses suggested that habitual alcohol consumption during pregnancy was not associated with adverse perinatal outcomes. However, 64% of the women who habitually consumed alcohol during pregnancy also habitually smoked; smoking leads to increased risks of a low birth weight and placental abruption. (J Nippon Med Sch 2015; 82: 163–165)

Key words: habitual alcohol consumption, pregnancy, perinatal outcomes, smoking, Japanese women

Introduction

According to several recent systematic reviews, maternal alcohol consumption at low to moderate levels during pregnancy does not contribute to stillbirth, intrauterine growth restriction, prematurity, low birth weight (BW), being small-for-gestational-age (SGA), or birth defects, including fetal alcohol syndrome^{1,2}. Although some earlier Japanese studies supported these overseas reviews^{3–5}, one recent report from southern Japan suggests that maternal alcohol consumption during pregnancy is significantly positively associated with the risk of prematurity⁶.

In this study, we investigated perinatal outcomes in pregnant women who habitually consumed alcohol during pregnancies managed at our hospital, which is one of main perinatal centers in Tokyo, Japan.

Methods

We reviewed the obstetric records of 4,719 Japanese women with singleton deliveries at ≥ 22 weeks' gestation at Japanese Red Cross Katsushika Maternity Hospital from 2012 through 2014. At delivery, the mothers were asked about alcohol consumption during pregnancy in face-to-face interviews with medical staff. The degree of alcohol consumption per day was evaluated according to a previous report by Doi et al⁷. When a woman said she had consumed 10 g or more of alcohol almost every day during pregnancy, we classified her as a habitual consumer of alcohol during pregnancy. From patient charts,

we extracted demographic information and the characteristics of labor, such as maternal age, smoking (≥ 5 cigarettes per day), parity, gestational age at delivery, perinatal complications, delivery modes, neonatal birth weight, Apgar scores, and umbilical artery pH.

Data are presented as the number (and percentage) of subjects or the mean \pm SD. For statistical analysis, the X² test was used for categorical variables, and Student's *t*-test was used for continuous variables. Odds ratios (ORs) and 95% confidence intervals (CIs) were also calculated. Differences with $p < 0.05$ were considered significant.

Results

Habitual alcohol consumption during pregnancy was diagnosed in 44 (0.9%) of the 4,719 women. Alcohol consumption per day in all 44 women was minimal or moderate (< 40 g).

Habitual alcohol consumption was significantly more likely among patients who smoked ($p < 0.01$; crude OR, 20.6; 95% CI, 11.7–36.1), experienced placental abruption ($p < 0.01$; crude OR, 9.54; 95% CI, 3.64–25.0), and had SGA fetuses ($p = 0.03$; crude OR, 2.25; 95% CI, 1.04–4.88) (Table 1). However, multiple logistic regression analyses suggested that habitual alcohol consumption was not associated with placental abruption ($p = 0.17$) or having SGA fetuses ($p = 0.35$). No cases of habitual alcohol consumption were complicated by fetal alcohol syndrome.

In addition, smoking was independently associated

Correspondence to Shunji Suzuki, MD, Department of Obstetrics and Gynecology, Japanese Red Cross Katsushika Maternity Hospital, 5-11-12 Tateishi, Katsushika-ku, Tokyo 124-0012, Japan
E-mail: czg83542@mopera.ne.jp
Journal Website (<http://www.nms.ac.jp/jnms/>)

Table 1 Clinical characteristics and perinatal outcomes of Japanese women who delivered at ≥ 22 weeks' gestation with and without habitual alcohol consumption during pregnancy

Habitual alcohol consumption diagnosed	No	Yes	P-value
Number of women	4,675 (99.1%)	44 (0.9%)	
Maternal age			
Average (years)	32.5 \pm 5.5	32.1 \pm 5.6	0.63
<20 years	59 (1.3%)	0 (0%)	0.45
≥ 35 years	1,974 (42.2%)	18 (40.9%)	0.86
Nulliparity	2,379 (50.1%)	18 (40.9%)	0.19
Smoking during pregnancy	133 (2.8%)	28 (63.6%)	<0.01
Maternal height (cm)	158.1 \pm 6.6	158.5 \pm 5.9	0.69
Maternal weight (kg)			
At prepregnancy	53.4 \pm 8.9	52.3 \pm 6.6	0.29
At delivery	63.8 \pm 9.3	63.3 \pm 7.0	0.72
Hypertensive disorders	392 (8.4%)	6 (13.6%)	0.21
Gestational diabetes	141 (3.0%)	1 (2.3%)	0.77
Placental abruption	62 (1.3%)	5 (11.4%)	<0.01
Gestational age at delivery			
Average (weeks)	38.5 \pm 2.1	38.5 \pm 2.1	0.98
<37 weeks	352 (7.5%)	3 (6.8%)	0.86
Cesarean delivery	1,037 (22.2%)	7 (15.9%)	0.32
Neonatal birth weight			
Average (g)	2,948 \pm 499	2,923 \pm 447	0.74
<2,500 g	634 (13.6%)	6 (13.6%)	0.99
Small for gestational age	420 (9.0%)	8 (18.2%)	0.03
Intrauterine fetal death	10 (0.2%)	0 (0%)	0.76
Apgar score			
<7 at 1 minute	143 (3.1%)	1 (2.3%)	0.76
<7 at 5 minutes	18 (0.4%)	0 (0%)	0.68
Umbilical artery pH <7.0	11 (0.2%)	0 (0%)	0.75
External birth defects	76 (1.6%)	1 (2.3%)	0.74
Maternal blood loss $\geq 1,000$ mL	462 (9.9%)	4 (9.1%)	0.86

Data are presented as the number (%) or mean \pm SD.

with placental abruption ($p=0.047$; adjusted OR, 2.48; 95% CI, 0.98–4.63) or being SGA ($p=0.03$; adjusted OR, 1.64; 95% CI, 1.03–2.60).

Discussion

The present study found that maternal minimal or moderate habitual alcohol consumption during pregnancy was not associated with any adverse perinatal outcomes, such as prematurity, which has been reported previously⁶. The present study may support several recent systematic reviews published overseas^{1,2} and earlier Japanese studies^{3–5}. In the present study, however, of the women in whom habitual alcohol consumption during pregnancy was diagnosed, 64% were habitual smokers. Smoking has been found to be strongly associated with increased risks of adverse perinatal outcomes, such as low BW and placental abruption^{8–11}. The specific abnormalities that are

caused by maternal smoking have been reported to provide additional insights into the genes and processes that are crucial for the formation of the fetomaternal interface in human pregnancy, leading to the adverse perinatal outcomes⁹. The present data also show that smoking was independently associated with placental abruption or being SGA when the same statistical analyses were performed. These findings also support the previous studies^{8–11}.

Because the present study had a small number of subjects, minimal or moderate habitual alcohol consumption diagnosed during pregnancy in Japanese women was not found to be associated with independent adverse perinatal outcomes. However, we should keep in mind that pregnant women who receive diagnoses of habitual alcohol consumption often show habitual smoking, which increases the risks of low BW and placental abruption.

Therefore, for the management of pregnant women with diagnoses of habitual alcohol consumption detailed interviews, including the use of conventional drugs, intensive counseling, and a careful fetal survey, should be conducted.

Conflict of Interest: The authors report no conflicts of interest. The authors are responsible for the content and writing of the paper.

References

1. Henderson J, Gray R, Brocklehurst P: Systematic review of effects of low-moderate prenatal alcohol exposure on pregnancy outcome. *BJOG* 2007; 114: 243–252.
2. Patra J, Bakker R, Irving H, Jaddoe VW, Malini S, Rehm J: Dose-response relationship between alcohol consumption before and during pregnancy and the risks of low birthweight, preterm birth and small for gestational age (SGA)-a systematic review and meta-analyses. *BJOG* 2011; 118: 1411–1421.
3. Ogawa H, Tominaga S, Hori K, Noguchi K, Kanou I, Matsubara M: Passive smoking by pregnant women and fetal growth. *J Epidemiol Community Health* 1991; 45: 164–168.
4. Maruoka K, Yagi M, Akazawa K, Kinukawa N, Ueda K, Nose Y: Risk factors for low birthweight in Japanese infants. *Acta Paediatr* 1998; 87: 304–309.
5. Nagata C, Iwasa S, Shiraki M, Sahashi Y, Shimizu H: Association of maternal fat and alcohol intake with maternal and umbilical hormone levels and birth weight. *Cancer Sci* 2007; 98: 869–873.
6. Miyake Y, Tanaka K, Okubo H, Sasaki S, Arakawa M: Alcohol consumption during pregnancy and birth outcomes: the Kyushu Okinawa Maternal and Child Health Study. *BMC Pregnancy Childbirth* 2014; 14: 79.
7. Doi T, Tanaka S, Sato Y, Ohta H, Minami S, Fujimi A, Kanisawa Y, Tamura F, Hirakawa M, Ono K: Effect of alcohol consumption on the prevalence of fatty liver disease (in Japanese). *Kanzo* 2000; 51: 501–507.
8. Matsuda Y, Hayashi K, Shiozaki A, Kawamichi Y, Satoh S, Saito S: Comparison of risk factors for placental abruption and placenta previa: case-cohort study. *J Obstet Gynaecol Res* 2011; 37: 538–546.
9. Kawashima A, Koide K, Ventura W, Hori K, Takenaka S, Maruyama D, Matsuoka R, Ichizuka K, Sekizawa A: Effects of maternal smoking on the placental expression of genes related to angiogenesis and apoptosis during the first trimester. *PLoS One* 2014; 9: e106140.
10. Zheng W, Suzuki K, Shinohara R, Sato M, Yokomichi H, Yamagata Z: Maternal smoking during pregnancy and growth in infancy: a covariance structure analysis. *J Epidemiol* 2015; in press.
11. Terada M, Matsuda Y, Ogawa M, Matsui H, Satoh S: Effects of maternal factors on birth weight in Japan. *J Pregnancy* 2013; 2013: 172395.

(Received, January 19, 2015)

(Accepted, May 8, 2015)