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Association between risk of neonatal pneumothorax and mode of anesthesia for cesarean delivery at term: A nationwide population-based retrospective cohort study

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2 CORRESPONDENCE

3 **Association between risk of neonatal pneumothorax and mode of anesthesia for cesarean**
4 **delivery at term: a nationwide population-based retrospective cohort study**

5 Cesarean delivery (CD) is considered a risk factor for neonatal pneumothorax, which is
6 associated with high morbidity and mortality. To reduce the risk of neonatal pneumothorax in
7 CD, it has been suggested to perform elective CD after 39 weeks of gestation.¹ The current
8 study is the first to evaluate the relationship between the mode of anesthesia for CD at term
9 and the risk of neonatal pneumothorax.

10 Our study cohort was sourced from anonymized, organized, and managed data of all
11 parturients and their live term newborns who were born by vaginally or by CD between 1
12 January 2000, and 30 November 2013. Data were retrieved from the Taiwan National Health
13 Insurance Research Database. The outcome was a diagnosis of neonatal pneumothorax within
14 28 days of delivery, according to the International Classification of Diseases, Ninth Revision,
15 Clinical Modification (ICD-9-CM) code.

16 In total, 65 228 parturients and their 97 429 newborns at term were included in the study
17 (Table 1). Modes of delivery were: vaginal, 63 701 (65.38%); CD with spinal anesthesia (SA),
18 22 188 (22.77%); CD with epidural anesthesia (EA), 10 364, (10.64%); and CD with general
19 anesthesia (GA), 1176 (1.21%). The overall 28-day neonatal pneumothorax rate during the
20 observation period was 0.07%. The 28-day neonatal pneumothorax rates for vaginal delivery,
21 SA, EA, and GA groups were 0.06%, 0.13%, 0.03% and 0.17%, respectively. In a
22 multivariable logistic regression model which included maternal age, anemia, previous
23 cesarean delivery, multiple gestation, diabetes mellitus, gestational diabetes, obstetric
24 complications (including pregnancy-related hypertension, preeclampsia, and eclampsia),
25 dysfunctional labor, and rupture of membranes, neonates born via CD with SA had an
26 adjusted odds ratio of neonatal pneumothorax of 2.42 (95% CI 1.32 to 4.45, $P=0.004$)
27 compared with those born vaginally. Although the adjusted odds ratio for GA was higher
28 (3.01, 95% CI 0.70 to 12.9) due to small numbers this was not statistically significant
29 ($P=0.14$).

30 Our results suggest that CD with SA is associated with an increased rate of neonatal
31 pneumothorax in term newborns. Although a causative relationship cannot be proven by our
32 data, a number of causative factors are possible. First, neonatal levels of catecholamines
33 (norepinephrine and epinephrine) in elective CD at term have been found to be lowest with
34 SA.² The catecholamine surge during labor increases the activity of the sodium channel,

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