Population based reference birth weights and risk factors for early neonatal death in Japanese twins from 2008 - 2010

2008-2010 年の日本全国における双胎児の出生児体重基準曲線と早期新生児死亡のリスク因子に関する研究

Abstract

Background: Twins have higher risk of adverse neonatal outcomes than singletons. In Japan, the current birthweight reference curve used for twins in clinical settings is outdated and based on data from singletons. Also, there are no population-based studies to identify the risk factors for early neonatal mortality among twins in Japan.

Objectives: To construct an up-to-date, population-based twins birthweight reference curve, and to identify the risk factors relating to early neonatal death.

Methods: For the birthweight reference, birthweight from birth registry data for 2008-2010 was tabulated by gestational week, and a reference curve calculated using smoothed b-splines. To assess risk factors for early neonatal death, multilevel poisson regression was performed, adjusting for gestational age, maternal age, parity, birthweight discordance, and sex.

Results: After adjusting for the intra pair effect, infants born in the 25th week to 29th week had higher risk of mortality (adjusted incidence risk ratio (IRR) 17.33; 95%CI 11.36-26.46), as did twins born before the 25th week of gestation (adjusted IRR 189.75; 95% CI 129.21-278.67), to

mothers aged younger than 25 years old (adjusted IRR 1.64; 95%CI 1.05-2.56). For birthweight discordance, small for gestational age (SGA)-Large for gestational age (LGA) pairs had the highest increased risk of mortality (adjusted IRR 6.06; 95% CI 2.38-15.41), followed by SGA-SGA pairs (adjusted IRR3.74; 95% CI 1.38-10.13), and appropriate gestational age (AGA)-SGA pairs (adjusted IRR 3.14; 95%CI 2.08-4.75), compared with AGA-AGA pairs.

Conclusions: The birthweight reference curve developed in this study should be used for twins in clinical settings. Young mothers (under 24 years old), babies delivered before the 25th week of gestational age, and pairs with large birthweight difference within the pairs or SGA-concordant pairs are at high risk for early neonatal mortality and should be screened and specially treated.

Key words: birthweight reference, early neonatal death, maternal age, preterm, SGA, twin