Mortality in Infants with Intrauterine Growth Restriction Compared to Small for Gestational Age Infants

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Introduction

The definition of intrauterine growth restriction (IUGR) is often inconsistent and sometimes equated with the term small for gestational age (SGA), which refers to constitutionally small infants who have reached their growth potential.

Objective

This study aimed to compare mortality rate in IUGR and SGA infants using uniform criteria in a large population.

Methods

Retrospective single-center cohort study, including data of infants live-born from 2005 to 2016 in the UniversityHospital Zurich with gestational age (GA) ≥ 24.0 weeks. Both IUGR and SGA were defined as an estimated fetal weight below 10th percentile according to gestational age matched normative values, IUGR additionally having umbilical artery Doppler resistance index above the 97th percentile. A 32 weeks cut-off was used to form strata. Mortality rate was compared using regression models adjusted for baseline characteristics that were unequally distributed across groups.

Results

Among 27'959 infants with complete prenatal and neonatal datasets, 556 IUGR (2%) and 2266 SGA (8%) infants were identified. IUGR infants had a lower GA (33.6 ± 3.7 weeks) compared to SGA infants (36.7 ± 3.7 weeks). Overall mortality rate was higher in IUGR (5%) than in SGA (2%) infants [OR (95%-CI): 2.8 (1.7 to 4.5)], but comparable after adjustment for GA, multiple pregnancy, caesarean section and birth weight z-score [adjusted OR (95%-CI): 1.0 (0.5 to 2.1)] (Table 1). When stratified by GA, 28 of 30 deaths (93%) and 44 of 45 deaths (98%) were found in the <32 weeks IUGR (178/556) and SGA (278/2266) subgroups, respectively [adjusted OR (95%-CI): 0.6 (0.3 to 1.1)] (Table 2).

Figure 1: Flow chart of the population studied. Exclusion criteria were applied in the top-down order. EFW = Estimated Fetal Weight.

Table 1: Comparison of Mortality in IUGR and SGA infants.

	Mortality N (%)
IUGR (N = 556)	30 (5%)
SGA (N = 2266)	45 (2%)
Odds Ratio (95% CI)	2.8 [1.7, 4.5]*
Adjusted Odds Ratio (95% CI)	1.0 [0.5, 2.1]

Table 2: Mortality of IUGR and SGA infants when stratified by GA.

	Mortality N (%)
IUGR < 32. Weeks of GA (N =178)	28 (15.7%)
SGA < 32. Weeks of GA (N = 278)	44 (15.8%)
Odds Ratio (95% CI)	1.0 [0.6, 1.7]
Adjusted Odds Ratio (95% CI)	0.6 [0.3, 1.1]

Note: * p < 0.001. Adjustment was done for multiple pregnancy, caesarean section, birth weight z-score and GA was only considered when not stratified. GA = Gestational Age.

Conclusion

In this single-center cohort, the difference in mortality rate between IUGR and SGA infants is comparable and likely predominantly due to gestational age.