Length of Stay and Readmission Among Late Preterm Infants: An Instrumental Variable Approach

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Abstract

OBJECTIVE: Evidence to guide safe discharge for late preterm infants (34–36 weeks' gestation) is lacking. Previous studies have demonstrated the increased risk of neonatal readmission for these infants compared with those born at term (≥37 weeks’ gestation). The purpose of this study was to estimate the effect of length of stay (LOS) on 7-day readmissions in this population.

METHODS: This was a retrospective study using hospital discharge data linked with vital records for late preterm infants delivered vaginally in California from 1993 to 2005. Exclusion criteria included complications likely requiring neonatal intensive care. The effect of LOS was assessed by using birth hour as an instrumental variable to account for unmeasured confounding. By using a matching algorithm, we created pairs of infants with different LOS based on birth hour but otherwise matched on known confounders for readmission risk, including birth year, hospital, and clinical and demographic covariates such as gestational age, birth weight, race, and insurance.

RESULTS: We produced 80 600 matched pairs of infants with different LOS based on birth hour. In 122 pairs, both infants were readmitted within 7 days, and in 75 362 pairs, neither infant was readmitted. Of the remaining 5116 matched pairs in which only 1 infant was readmitted, 2456 infants with long LOS and 2660 infants with short LOS were readmitted. We found no evidence that longer LOS reduces the odds of readmission (1-sided $P$ value = .99).

CONCLUSIONS: By using an instrumental variable approach and matching algorithm, longer LOS was not associated with decreased readmission within 7 days of discharge for these late preterm infants.