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Car Seats or Car Beds for Very Low Birth-Weight Infants?

Most NICUs have adopted some form of car seat challenge prior to discharge of very low birth-weight (VLBW) infants. Protocols for car seat challenges are not standardized, and criteria for passing or failing the test vary widely among institutions.[1] The options for an infant who has "failed" the car seat challenge seem to be (1) retest until the infant passes, (2) wait a few days and retest, or (3) discharge in a car bed instead of a car seat.[1] The third option, use of a car bed, is based on the assumption that infants who have cardiorespiratory compromise (apnea, bradycardia, oxygen desaturation) in a car seat will not experience these events in a car bed.[1]

A study in the *Journal of Pediatrics* compares the incidence of apnea, bradycardia, or desaturation in preterm, VLBW infants (≤ 1500 g) in car seats with that in car beds during a car seat challenge.[2] One hundred fifty-one infants were studied for 2 hours in both a car seat and a car bed, while apnea (>20 seconds), bradycardia (<80/min for >5 seconds), desaturation (SpO_2 < 88% for >10 seconds), and nasal air flow were monitored. Investigators found no evidence that an event is less likely to occur in a car bed than a car seat: 23 infants (15%) had ≥1 event in the car seat, compared with 29 (19%) in the car bed ($P = .4$) The length of time until the first event occurred was similar in the car seat and car bed (mean 54 to 55 minutes).[2]

It is important to advise parents that, regardless of car safety device used, VLBW infants require close observation during travel.[2] Furthermore, long trips should be discouraged; if unavoidable, they should be interrupted with frequent rest stops.[1]

References

1. Greenberg JM. The challenge of car safety seats. *J Pediatr.* 2007;150:215-216.
2. Salhab WA, Khattak A, Tyson JE, et al. Car seat or car bed for very low birth weight infants at discharge home. *J Pediatr.* 2007;150:224-228.

Car Seat or Car Bed for Very Low Birth Weight Infants at Discharge Home

Salhab WA, Khattak A, Tyson JE, et al.. J Pediatr. 2007;150:224-228.

Summary

The current recommendation for premature infants is that they be monitored for apnea and bradycardia in a car seat prior to discharge. Infants experiencing events during the monitoring period should be discharged to home in a car bed.[1] This study, conducted with very-low birthweight (VLBW or ≤ 1500 g) infants at 2 hospitals, sought to elucidate whether infant beds were safer than infant car seats for VLBW infants.

When they were ready for discharge, each infant was tested for 2 hours in both devices with at least 1 hour between the 2 testing periods. All infants were > 1800 g at testing, were feeding well, and had not experienced apnea or bradycardia for at least 5 days. During the test periods, recording event monitors measured nasal air flow, oxygen saturation, heart rate, electrocardiogram tracing, and respiratory rate.

'Apnea' was defined as a longer than 20-second cessation of respiration or for shorter periods if cyanosis was present; 'bradycardia' as < 80 beats per minute for 5 seconds or more; and 'desaturation' as < 88% for at least 10 seconds. Apneas were further described as central or obstructive. The analyses also incorporated demographic and clinical information about each infant. This trial was powered to detect a 50% reduction in events.

There were 151 infants in this trial, with a median birth weight of 1120 g. The median weight was 2545 g at time of study. Fifty-four percent of the infants were Hispanic, with 29% African American, and 16% white.

Twenty-eight percent of the infants had at least 1 event during testing, with 9.2% having an event only in the car seat, 13.2% in the bed only, and 5.9% having an event in both. There was no difference between the 2 carrier types in the percentage of infants who required intervention from a nurse during testing. Lower gestational age was associated with events in both devices.

The authors conclude that all VLBW infants are at risk of apnea, bradycardia, or desaturation at discharge regardless of carrying device. The authors also note that brief periods of observation in such devices may not uncover significant events since the time to first event in this study was almost 1 hour (54 or 55 minutes, depending on device).

Viewpoint

Powering this trial to detect a 50% difference ran the risk of 'missing' smaller differences between the 2 devices. However, the very similar outcomes between the 2 carrier types lower my concern about this study being too small. I would be more concerned if the percentages seemed to favor one device, but the *P* value was 'nonsignificant.' The authors emphasize 1 very important take-home message from this research: many VLBW infants are at risk for events when in any infant carrier device.

This study demonstrates that prolonged observation may be required to 'uncover' infants who may be at risk for events, and the study is very valuable for testing well a theoretical assumption -- that infant car beds might be 'safer' for some infants. The study can't however offer guidance about what to do when such an infant is identified. In an accompanying editorial, James Greenberg notes that 'passing' the car seat challenge at discharge may also offer false reassurance, especially if the challenge is a brief one.[2] He suggests more prolonged intermittent monitoring with education to parents of the risk of prolonged infant seat riding in these vulnerable infants.