

Can Changes in Clinical Practice Decrease the Incidence of Severe Retinopathy of Prematurity in Very Low Birth Weight Infants?

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Objective

A wide variability in the incidence of severe retinopathy of prematurity (ROP) is reported by different centers. The altered regulation of vascular endothelial growth factor from repeated episodes of hyperoxia and hypoxia is 1 important factor in the pathogenesis of ROP. Strict management of O₂ delivery and monitoring to minimize these episodes may be associated with decreased rates of ROP. The objective of this study was to compare the incidence of and need for surgery for severe ROP (stages ≥ 3) in infants of 500 to 1500 g birth weight before and after the implementation of a new clinical practice of O₂ management in a large level 3 neonatal intensive care unit (NICU).

Methods

An oxygen management policy that included strict guidelines in the practices of increasing and weaning of fraction of inspired oxygen (FIO₂) and the monitoring of O₂ saturation parameters in the delivery room, during in-house transport of infants to the NICU, and throughout hospitalization was implemented in April 1998. The main objectives were to monitor oxygenation levels more precisely and to avoid hyperoxia and repeated episodes of hypoxia-hyperoxia in very low birth weight infants. Included in the policy were equipment for monitoring, initiation of monitoring at birth, avoidance of repeated increases and decreases of the FIO₂, minimization of "titration" of FIO₂, modification of previously used alarm limits, and others. After an educational process, each staff member signed an agreement stating understanding of and future compliance with the guidelines. Examinations were performed by experienced ophthalmologists following international classification and American Academy of Pediatrics recommendations. ROP data from January 1997 to December 2002 for infants of 500 to 1500 g were analyzed as usual and also have been reported to Vermont Oxford Network since 1998.

Results

The incidence of ROP 3 to 4 at this center decreased consistently in a 5-year period from 12.5% in 1997 to 2.5% in 2001. The need for ROP laser treatment decreased from 4.5% in 1997 to 0% in the last 3 years.

Conclusions

We observed a significant decrease in the rate of severe ROP in very low birth weight infants in association with an educational program provided to all NICU staff and the implementation and enforcement of clinical practices of O₂ management and monitoring. Although several confounders cannot be excluded, it is likely that differences in these clinical practices may be, at least in part, responsible for the documented inter-center variability in rates of ROP.