

The Role of Pre-Plus Disease in the Efficacy of Supplemental Oxygen for Stage 2 Retinopathy of Prematurity

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Background/Objective:

Retinopathy of prematurity (ROP) is a vasoproliferative retinal disorder primarily affecting premature infants and remains a leading cause of preventable childhood blindness. Recent evidence suggests that supplemental oxygen administered to maintain an oxygen saturation of 97-99% may help arrest disease progression from retinal ischemia and hypoxia. The influence of pre-plus disease on treatment response to oxygen supplementation, however, has not been well characterized. We sought to examine whether pre-plus status at oxygen therapy initiation impacts its effectiveness in preventing the need for laser photocoagulation or intravitreal bevacizumab (IVB) in infants with stage 2 ROP.

Methods:

A retrospective chart review was performed on infants diagnosed with stage 2 ROP at Riley Hospital for Children between 8/2020 and 9/2024. Infants were stratified based on vascular findings at the initiation of oxygen therapy as either “pre-plus” or “normal”. Demographic data and clinical comorbidities known to affect ROP were collected from medical records for both cohorts. The primary endpoint was the requirement for ROP intervention.

Results:

A total of 152 patients met inclusion criteria, of which 70 had pre-plus disease and 82 had normal vasculature at oxygen therapy initiation. Infants with pre-plus disease had significantly lower birthweights ($p = 0.02$) and gestational age at birth ($p < 0.01$), as well as a higher occurrence of sepsis ($p = 0.01$). The need for treatment was substantially higher in the pre-plus cohort (54%) compared to the normal cohort (22%, $p < 0.01$). Both cohorts were similar in the type of treatment received, the age of first treatment, and the number of laser spots.

Conclusion:

The presence of pre-plus disease when supplemental oxygen is initiated correlates with significantly higher rates of subsequent ROP treatment, indicating that oxygen therapy alone may be less effective in this population. Patient stratification based on pre-plus status should be considered when assessing supplemental oxygen use.