Commentary on long-term macular vascular density measured by OCT-A in children with retinopathy of prematurity.

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About the Study

Laser photocoagulation is one of the therapeutical options for the treatment of Retinopathy of Prematurity (ROP) [1-3]. Although generally considered a safe procedure, it may be associated with an increased risk of cataract development and myopia [2,4,5]. Recent studies with optical coherence tomography angiography (OCT-A) in former preterm children with history of ROP have additionally demonstrated changes in macular morphologic and vascular parameters [6-11]. However, since there are few publications on this topic, we still do not know the long-term impact of laser treatment on macular parameters and vasculature in addition to the effects of the disease [6-11]. Our study aimed to assess long-term superficial vascular density measured by OCT-A in former preterm children with history of ROP with and without need of laser treatment.

Discussion

We enrolled a population of former premature children with a birth weight (BW) <1500 gr and/or gestational age (GA) <32 weeks that developed stage 2 or 3 ROP and kept follow-up at our department for more than 10 years. Children were divided in 2 groups according to laser requirement and underwent a complete ophthalmologic evaluation, including best corrected visual acuity (BCVA) assessment and OCT-A (Zeiss Cirrus HD-OCT 5000 with Angioplex 6 × 6 mm). Cases of high myopia (≥ -6.00 D) were excluded.

Fifteen eyes of children with history of stage 3 plus ROP, of whom 7 had involvement of zone 1, were included in Group 1 (Laser-requiring ROP) and 19 in Group 2 (Non-treated ROP), with a mean age of 14.80 ± 2.30 and 15.50 ± 1.50 years ($p=0.57$), respectively. Group 2 included 13 eyes of children with history of stage 2 ROP and 6 of stage 3 ROP, none of which with plus disease or involvement of zone 1. Group 1 had lower mean GA and BW than Group 2 (25.40 ± 0.80 vs 26.80 ± 1.40 weeks, $p<0.001$; 638.00 ± 112.00 vs 885.00 ± 99.00 gr, $p<0.001$, respectively). BCVA was lower in Group 1 (0.08 ± 0.04 logMAR vs 0.04 ± 0.07 logMAR, $p=0.03$). Group 1 had also lower vascular parameters, especially central and internal vascular density (9.15 ± 2.75 vs 10.52 ± 0.86 mm^{-1}, $p=0.05$; 13.74 ± 1.00 vs 15.86 ± 0.64 mm^{-1}, $p=0.05$; respectively). There were differences in morphological parameters between groups as well, particularly in mean macular thickness, which was higher in Group 1 (300.50 ± 10.50 vs 281.11 ± 2.50 µm, $p=0.05$), and in avascular zone circularity, lower in Group 1 (0.58 ± 0.06 vs 0.76 ± 0.02, $p<0.001$). BCVA was correlated with macular internal, external and total vascular density and flow ($p<0.05$). No correlation was found between BCVA and morphological parameters ($p>0.05$). GA and BW were both correlated with BCVA ($p<0.001$).

Our paper demonstrated that children with Laser-requiring ROP have a decrease of long-term BCVA, which was at least partially associated with a decrease in superficial macular vascular density and flow. Nevertheless, degree of prematurity was greater in children who underwent laser treatment, which might have influenced our results.

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