Clinical Features and Outcomes of Infants with Retinopathy of Prematurity Who Fail Anti-VEGF Therapy

Lucy Xu, MD
Atlanta, GA

David Levine, MD, Amy Hutchinson, MD, Prethy Rao, MD, G. Baker Hubbard, III, MD

Purpose:
To describe characteristics and outcomes of patients with retinopathy of prematurity (ROP) who failed treatment with intravitreal anti-VEGF.

Methods:
Retrospective review of ROP evaluated at Children’s Healthcare of Atlanta (CHOA) with a history of intravitreal anti-VEGF treatment. Treatment failure was defined as need for repeat anti-VEGF or laser prior to post-menstrual age (PMA) 50 weeks, or recurrent plus, neovascularization, or stage 4 or 5 ROP at any PMA. Clinical features and outcomes were collected for patients who failed initial treatment.

Results:
221 eyes of 128 patients were treated with intravitreal bevacizumab (IVB) for type 1 ROP at the CHOA between 2011-2019. 19 eyes (8.6%) of 13 patients failed initial therapy. 3 additional patients (4 eyes) were referred for management of failed anti-VEGF from other institutions. In total, 23 eyes (16 patients) were analyzed. The median PMA at initial treatment was 36.0 weeks (IQR 35-36.9) and median time to failure was 10.6 weeks (IQR 6.5-13.5). Treatment failure manifested as recurrent plus (11 eyes), recurrent stage 3 (11 eyes), stage 4A (4 eyes), vascular arrest in zone 1 (2 eyes), vitreous hemorrhage (1 eye), no response (1 eye), and peripheral tractional retinal detachment 5 years later (1 eye). Treatment failures were managed with laser (13 eyes), repeat IVB (4 eyes), pars plana vitrectomy (PPV) (2 eyes), combined laser/IVB (2 eyes), and combined PPV/IVB (2 eyes). 7 of 23 (30%) eyes failed a second treatment and they manifested as stage 4A (3 eyes), persistent stage 3 (2 eyes), and rhegmatogenous retinal detachment (2 eyes). Second treatment failures were managed with laser (2 eyes), PPV (1 eye), combined PPV/IVB (2 eyes), and combined scleral buckle/PPV (2 eyes). Follow-up of >6 months was available for 15 of 23 eyes. The retina was fully attached in 14 eyes and detached in 1 eye. Fixation behavior was present in 7 eyes.

Conclusions:
Treatment failure rate after IVB was 8.6%. The most common manifestations of failure were recurrent plus and recurrent stage 3. The majority of treatment failures were successfully managed with laser. Most patients who failed IVB had favorable anatomic outcomes and half demonstrated fixation behavior.