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Treatment of retinopathy of prematurity with aflibercept in Russia

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Introduction: In 2016 for the first time in Russia, we began to use aflibercept (VEGF) for the treatment of retinopathy of prematurity. Despite the current scientific and technological progress achieved in neonatology and intensive care, a premature baby often suffers from severe comorbidities that generally lead to early disability already in childhood. One of the most common causes of childhood blindness and vision impairment is retinopathy of prematurity (ROP). In developing countries with middle-income, such as Latin America, Eastern Europe, India and China, ROP is considered to be the leading cause of child blindness. In most countries laser photocoagulation has largely replaced the cryotherapy of the peripheral avascular retina and is recognized as the standard of treatment for ROP. Recently vascular endothelial growth factor (VEGF) has been recognized as the key factor in the pathogenesis of ROP. Inhibitors of VEGF (anti-VEGF drugs) are widely used in ophthalmology for treatment of retinal diseases associated with neovascularization and macular edema. Aflibercept use for ROP treatment potentially may have several advantages. Aflibercept molecule was specially designed for strong, broad and long-lasting anti-angiogenic activity.

Material and Methods: This study is retrospective observational consecutive case series. The study included 132 (264 eyes) infants with retinopathy of prematurity (ROP) who were hospitalized and received treatment at «Scientific and Practical Center of Pediatric Specialized Medical Care» in Moscow between October 2016 and November 2017. All patients were treated with single dose of intravitreal aflibercept 0.6 mg/0.015 ml. Additional injections were possible if recurrence of retinopathy of prematurity occurred defined as following: recurrence of vascular activity in central and peripheral zones of the retina. Exudation and proliferation in central zone of the retina and on the border with avascular zones. This includes formation of arteriovenous fistula and fibrous tissues (epiretinal membranes). Intravitreal aflibercept injections were performed in operating room settings. Specialized equipment was used for anesthesia of infants with low and extremely low weight. Three days prior aflibercept injection all infants received topical antibiotics (Levofloxacin, 0.5%) and atiseptic (Picloxydinum, 0.5 mg) 1-2 drops 4 times a day applied epibulbar in both eyes. Intravitreal injection was performed according to the standard technique. Prior the injection skin was prepared with antiseptic solution (Octenisept) followed by the epibulbar antibiotic application. Blepharostat was used. After the injection tamponade of injection site was performed. Antibiotic ointment (Ofloxacin, 0.3%) was applied to lower eyelid. After the aflibercept injection and during 7 days following the injection all infants received antibiotics (Levofloxacin, 0.5%) and antiseptic (Picloxydinum, 0.5 mg) 1-2 drops 4 times a day applied epibulbar in both eyes.

Results: 132 patients (264 eyes) with retinopathy of premature were treated with intravitreal aflibercept 0.6 mg/0.015 ml used as monotherapy. 51 infants (38.64%) were female. Mean gestational age at birth was 27.62 ±2.44 weeks. Mean postconceptual age at the moment of first aflibercept injection was 40.11±5.88 weeks. Most of the patients (71.97%) had stage 3+ retinopathy. Baseline demographic and clinical characteristics are summarized in table 1. Out 132 patients only 106 patients (212 eyes) have completed observation period and reached 55 weeks of postconceptional age. Therefore 26 patients were not evaluated for complete vascularization of 3 retina zones at the postconceptual age of 55 weeks. Four patients did not reach 55 weeks of postconceptional age and were withdrawn from observation due to the fatal outcomes. 22 patients did not reach 55 weeks of postconceptional age due later treatment initiation and therefore shorter observation period.

Conclusion: Intravitreal aflibercept 0.6 mg potentially is an effective treatment for retinopathy of prematurity that potentially will prevent child blindness. Use of anti-VEGF for ROP treatment has several advantages in contrast to laser photocoagulation that include ability to reduce the anesthesia time to 5 minutes, absence of retinal damage, absence of need for expensive equipment, the lack of long training on expensive equipment.

Biography

Evgeny E. Sidorenko - PhD, graduated Russian State Medical University in 2006. PhD. thesis on “Laser thermal keratoplasty for hyperopic anisometropia in children”. 2008 - bronze medal in the International Trade Fair “Ideas, Inventions, New products", Nuremberg, Germany. In 2009. he participated in the act of charity underwent under the patronage of Moscow Government “Open World for Children” (eye examination of children and their parents) and in the Koch-Mechnikov-Forum, communication between Russian Academy of Medical Sciences and M8 Health Summit. 2011 First Prize in Ophthalmology section, 22nd European Students’ Conference, Berlin.