

## Neovascular Glaucoma in Diabetic Retinopathy

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**Received:** October 24, 2015; **Published:** October 31, 2015

Neovascular glaucoma (NVG) is a well-established and urgent clinical entity associated with diabetic retinopathy (DR). There is only a short period of time in which we are able to treat patients, similar to retinopathy of prematurity (ROP) and other ischemic retinopathies.

Early Treatment Diabetic Retinopathy Study (ETDRS) high risk characteristics comprises disc neovascularization or neovascularization elsewhere and vitreous hemorrhage. When intraocular pressure (IOP) is high, it is a sign of damage to trabecular meshwork and should be considered urgency. Although there are some reports of patients with NVG without retinal or optic disc neovascularization, that develop rapidly NVG and painful eye, it is more commonly seen in association with proliferative diabetic retinopathy [1].

Conventional treatment for NVG comprises panretinal photocoagulation (PRP), retinal cryotherapy or endolaser to reduce oxygen consumption by ischemic retina [2,3]. Nowadays, the recent advances in anti-vascular endothelial growth factor (anti-VEGF) therapy have resulted in a reconsideration of what the gold-standard therapy should be. There are several studies that have found good outcomes in patients with NVG treated with anti-VEGF as adjunct therapy [1,2,4-9].

If the main objective for the treatment on NVG is protecting angle anatomy from the formation of new vessels and optic nerve from spikes of IOP, anti-VEGF therapy can reverse more efficiently and rapidly the new vessel formation than PRP, however PRP is not excluded on the treatment, but we must not forget the difficulties we can face in situations with media opacities such as corneal edema and cataract, in which case anti-VEGF offer a good treatment option. Some studies report regression of new vessels when performing PRP in 72% at three weeks, while anti-VEGF therapy can lower intravitreal concentrations of VEGF as early as 24-48 hrs and regression of new vessels in 7 days [9,10]. So, whereas PRP permanently controls retinal ischemia in the later period, anti-VEGF therapy controls the early phase.

In our opinion, every ophthalmologist and others eye care givers, should be aware of the clinical presentation in order to initiate anti-VEGF as only treatment or as adjunct therapy on time; as we said before, once trabecular meshwork is damaged, medical treatment offers very little relief, so the priority should be the prevention of its development, a complete and careful examination of the iris and angle is essential, before the pupil is dilated.

Unfortunately, many times we see patients with painful eyes and very high IOP of more than 30mmHg, question arises whether what to do first: paracentesis with subsequent anti-VEGF injection or visceversa. We prefer the first option to avoid IOP spikes and also to prevent the probable egress of the medication from anterior chamber, especially in those patients with aphakia or pseudophakia. We want to emphasize the importance of early anti-VEGF treatment in the acute phase and preferably when the angle is still open because, this way we could prevent a secondary angle closure that will bring a worst prognosis and difficult management.

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**Citation:** Hugo Quiroz-Mercado and Mariana Camacho-Mendez "Neovascular Glaucoma in Diabetic Retinopathy". *EC Ophthalmology* 2.6 (2015): 185-186.

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Currently we still do not have a satisfactory means of treating NVG and preventing visual loss in the majority, while control of IOP is important, visual outcome also depends upon the severity of underlying ocular disease and other complex factors. Thus, successful control of IOP does not always correspond with visual outcome; meanwhile we think that the most important thing is to prevent the development by a careful examination, and once stage I or II develops, intravitreal injection of anti-VEGF with or without previous paracentesis depending on the IOP, as well as PRP, considering also drainage implant device.

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**Volume 2 Issue 6 October 2015**

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