Treatment Of Neovascular Glaucoma: Our Three-Year Experience At A Tertiary Referral Hospital In Indonesia

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BACKGROUND

Neovascular glaucoma (NVG) is a severe sequel of ocular ischemia due to various conditions including retinal vein occlusion, diabetic retinopathy, and ocular ischemic syndrome.1,2 In Indonesia, study by Artini and Dare in 2011 at Cipto Mangunkusumo Hospital found the incidence of NVG was up to 8% between 2005 and 2007.1

NVG poses tremendous challenge in its management. Surgery is indicated in NVG with uncontrolled intraocular pressure (IOP) with maximally tolerated antiglaucoma medications. Surgical modalities vary from filtering surgery, glaucoma drainage device (GDD) implantation, to cycloductive procedures.

Bevacizumab is a monoclonal vascular endothelial growth factor (VEGF) inhibitor which induces regression of iris neovascularization when administered through intravitreal route.3,4 Studies have been published regarding the use of IVB injection in NVG cases.4,6

The purpose of this study was to review and evaluate causes, treatment modalities and success rate of neovascular glaucoma (NVG) management in the three year period at Cipto Mangunkusumo Hospital, Jakarta as the tertiary referral hospital in Indonesia. We hope that this study can provide considerations for Indonesian ophthalmologist in making clinical decisions for NVG management.

METHODS

This conservative, retrospective, interventional case series included 74 eyes from 70 patients with NVG of any cause who visited the Glaucoma Division, Department of Ophthalmology, Cipto Mangunkusumo Hospital, between January 2012 and December 2014.

Of all 74 eyes diagnosed with NVG, 24 eyes were treated with trabeculectomy, 39 eyes underwent GDD implantation, while the other 11 eyes underwent cycloductive procedures (i.e. transcleral cyclophotocoagulation and cyclocryotherapy). Twenty out of 74 eyes were also given intravitreal bevacizumab (IVB) injection while the other 54 eyes were not. Eight eyes were treated with combination of trabeculectomy and IVB, 9 eyes with GDD implantation and IVB, and 3 eyes with cycloductive procedures and IVB.

Postoperative follow-up periods for all patients were at least 3 months with median follow-up duration was 11.0 (3.0-46.0) months.

Outcome measures included surgical success rate, IOP and visual acuity. Surgical success at final visit included complete or qualified success which was defined as an IOP of ≤ 21 mmHg and a 6 mmHg with or without antiglaucoma medication, without any additional glaucoma surgery, and the ability to maintain light perception. Surgical failure was defined as IOP < 6 mmHg and ≥ 22 mmHg with maximally tolerated antiglaucoma medications, if additional glaucoma surgery was performed, or if visual deterioration towards no light perception occurred.

RESULTS

Initial visual acuity and IOP were 2.3 (0.2-3.0) logMAR and 47.2 ± 13.9 mmHg. The most common etiology was proliferative diabetic retinopathy (51.4%) followed by central retinal vein occlusion (18.9%). GDD achieved higher overall success rate (59.0%) compared to trabeculectomy (37.5%) and cycloductive procedures (9.1%) as shown in figure 1A although the differences were not statistically significant (p=0.38). Higher success rate with IVB compared to no IVB (50.0% vs 42.6%; p=0.57) was shown in figure 1B. Highest success rate was achieved by GDD implantation combined with IVB (66.7%) followed by GDD implantation only (56.7%) as seen in figure 2. These findings are comparable with other studies.7 Improvement or stabilization of visual acuity was seen in 45.0% cases with IVB injection compared to 33.3% cases without IVB injection (p=0.36). No substantial differences were observed in final IOP or IOP reduction between cases with and without IVB injection (table 1).

Figure 1A. Surgical success rate for NVG. (1A) Comparison between 3 surgical modalities: (J88) Comparison between success of two groups of IVB vs no IVB group.

Figure 2. Surgical success comparison between 3 surgical modalities when performed in combination with IVB injection.

Table 1. Comparison of final clinical conditions including visual acuity, final IOP, and IOP reduction between the two groups.

CONCLUSION

GDD implantation is the surgical modality of choice for the management of NVG at our institution. GDD combined with IVB might offer better likelihood of successful surgery compared to other modalities. Treatment with IVB injection might increase the probability for improvement or stabilization of visual acuity.

References:

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