Nigerian Journal of Ophthalmology 2011; 19(1): 25-26

# Initial Experience with Bevacizumab (Avastin™) in the Treatment of Neovascular Age-related Macular Degeneration in Nigerian Patients

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## SUMMARY

**Objective:** To report on the early experience with the treatment of neovascular AMD with intravitreal injection of bevacizumab (Avastin) in Nigeria.

**Materials and Methods:** Eight eyes (7 patients) with neovascular AMD who met the inclusion criteria were treated with intravitreal 1.25mg bevacizumab between September 2008 and May 2009. Injections were given every 4-6 weeks. In total, 2–4 injections were given. One patient had bilateral treatment. All the patients were regularly followed up until December 2009.

**Results:** The presenting visual acuity ranged from light perception (LP) to counting fingers (CF). In 2 patients (2 eyes) their visual acuity improved 2 weeks after injection from CF to 6/36 and remained stable for 4 months. In another 2 patients (2 eyes) acuity improved from LP to CF. In yet 2 other patients (4 eyes) the visual acuity remained unchanged (HM in 2 eyes; CF in 2 eyes) after 9 months and 4 injections. Clinically the subretinal blood was observed to resolve, albeit slowly, in all the patients within 2 months from the start of treatment.

**Conclusions:** This preliminary experience suggests that intravitreal bevacizumab is safe and beneficial in Nigerian Africans with neovascular AMD. However careful patient selection, regular follow up and aseptic injection techniques are advised when treating these patients.

**Key words:** age-related macular degeneration, vascular endothelial growth factor (VEGF) inhibitors, Nigeria

## INTRODUCTION

Age-related macular degeneration (AMD) is seen commonly among the elderly in Nigeria.[1,2] At the Guinness Eye Center Onitsha it constitutes 19.4% of retinal diseases.[3] A community-based study in Anambra State showed that it is the second most common cause of blindness in patients aged above 50 years.[4] The neovascular form of the disease causes most of the blindness.[5]

In 2006 the use of monoclonal antibody, an inhibitor of vascular endothelial growth factor (anti-VEGF), ranibizumab (Lucentis™ Genentech California) for treatment of neovascular AMD was approved in the United States of America.[6] Cost issues even in developed countries led to the off-label use of the related drug, bevacizumab (Avastin™ Genentech, California).[6] Bevacizumab is the parent compound of ranibizumab. These drugs are not yet widely used in Nigeria.

The objective of this article is to report on the early experience with the treatment of neovascular AMD with intravitreal injection of bevacizumab (Avastin) in Nigerian Africans.

## MATERIALS AND METHODS

Eight eyes (7 patients) with neovascular AMD were treated with intravitreal injections of 1.25mg bevacizumab between September 2008 and May 2009. Criteria for selection for treatment included subretinal hemorrhage, and retinal pigment epithelial degeneration in the posterior pole in a person 50 years or older for which there is no other retinal vascular disease to account for these features. Patients with pigment epithelial detachment were not injected with bevacizumab and so were excluded from this study. The selected patients had complete ocular examination including visual acuity test, slit lamp examination of the anterior segment, applanation tonometry, slit lamp fundus examination with 78D noncontact lens and indirect ophthalmoscopy.

The injection was given in the operation room under strict aseptic conditions. Anesthesia was given in the form of subconjunctival injection of 2% xylocaine injection in the part of the eye chosen for the intravitreal injection. The intravitreal injections were given with insulin syringe and 25G needle 4mm from the limbus in the temporal or inferior temporal quadrant. Anterior chamber paracentesis was also performed during the injection using another 25G needle.

Injections were given every 4-6 weeks in accordance with the recommendations of previous studies.[6] In total, 2 – 4 injections were given. One patient had bilateral treatment. All the patients were regularly followed up to December 2009. The patients were followed up as follows: 1 day post injection; 2 weekly until injection was stopped; then 6 weekly. Follow-up examination included visual acuity test, slit lamp examination of the anterior segment, applanation tonometry, slit lamp fundus examination with 78D noncontact lens and indirect ophthalmoscopy. We did not have facilities for fluorescein angiography or optical coherence

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tomography.

## RESULTS

The presenting visual acuity ranged light perception (LP) to counting fingers (CF). In 2 patients (2 eyes) visual acuity improved 2 weeks after injection from CF<1/2m to 6/36 and remained stable for 4 months. In another 2 patients (2 eyes) visual acuity improved from LP to CF. In yet 2 other patients (4 eyes) the visual acuity remained unchanged (HM in 2 eyes; CF in 2 eyes) after 9 months and 4 injections. The intraocular pressures were within normal limits before the injections (10 -16mmHg) and throughout the follow up period (10-17mmHg). Only in one patient had a slight rise in the IOP from 15mmHg pre-injection to 17mmHg at the last follow-up visit.

No untoward effects such as retinal detachment or raised intraocular pressure or endophthalmitis was observed. Clinically the subretinal blood was observed to resolve, albeit slowly, in all the patients within 2 months of the commencement of treatment.

## DISCUSSION

Our initial observation suggests that intravitreal bevacizumab is safe and effective in the treatment of neovascular AMD in Nigerian Africans. This is similar to the experience in developed countries where the drug is widely used. (It should be stressed that bevacizumab is officially approved for colonic cancer[6] and that its cousin, ranibizumab, is the approved drug for treating retinal vascular disorders.[6] However cost issues even in developed countries led to off-label use of bevacizumab.)

The improvement in acuity in the patients was rapid, occurring within 2 weeks of injection. However it is clear from this small series that although 50% of the eyes had improved Snellen visual acuity of 2 or more lines, another half never had any improvement in spite of multiple injections. Further studies are required to find which patient is more likely to benefit from this treatment in our environment. This study is limited by the non-availability of facilities for fluorescein angiographic studies in the patients. In spite of being cheaper than ranibizumab, bevacizumab is still beyond the reach of many patients who would benefit from it in our hospital. A deliberate policy of making bevacizumab and ranibizumab available in public hospitals will be of benefit to many patients with intraocular neovascular disease and widen the experience of the treating physicians.

Another drawback is that some patients are not comfortable with repeated injections. Intravitreal injection is associated with risk of endophthalmitis and retinal detachment. Adverse cardiovascular events have also been associated with bevacizumab. But none of these were encountered in this series. However it should be cautioned that the small number of patients in our initial experience does not allow for definitive conclusions with regard to complications.

In conclusion, this preliminary experience suggests that intravitreal bevacizumab is safe and beneficial in Nigerian Africans with neovascular AMD. However, careful patient selection, regular follow-up and aseptic injection techniques are advised when treating these patients.

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