Bevacizumab in Inflammatory Eye Disease

MCGREGOR N. LOTT, JOYCE C. SCHIFFMAN, AND JANET L. DAVIS

• PURPOSE: To report the effect of intravitreal bevacizumab (Avastin; Genentech Inc, South San Francisco, California, USA) on visual acuity and macular thickness in patients with inflammatory choroidal neovascularization (CNV) or cystoid macular edema (CME).
• DESIGN: Retrospective, noncomparative, interventional case series.
• METHODS: Each eye received 1.25 mg of intravitreal bevacizumab at baseline. Follow-up examinations were scheduled at 1- to 2-month intervals, with additional injections at the discretion of the physician. Comprehensive evaluations, including Snellen best-corrected visual acuity (BVCA) and optical coherence tomography measurements, were performed at each visit. Main outcome measures were BCVA and central subfield thickness (CST), as measured by optical coherence tomography.
• RESULTS: Thirty-four eyes of 30 patients with inflammatory CNV (n = 21 eyes of 19 patients; 9 male, 10 female) or CME (n = 13 eyes of 11 patients; 4 male, 7 female) were identified. Median ages were 52 years (range, 7 to 83) and 67 years (range, 17 to 83) for the CNV and CME groups, respectively. The median length of follow-up for CNV eyes was 7 months (range, 1 to 28) while the median follow-up for CME eyes was 13 months (range, 1 to 20). Both groups received a median of two injections (range, 1 to 9 for CNV and 1 to 4 for CME). For eyes with CNV, BCVA improved significantly at follow-up month 1, but was not different from baseline thereafter; CST remained unchanged throughout follow-up. For eyes with CME, neither BCVA nor CST changed significantly over the course of follow-up.
• CONCLUSIONS: Bevacizumab appears to stabilize BCVA and CST for eyes with inflammatory CNV or CME. (Am J Ophthalmol 2009;148:711–717. © 2009 by Elsevier Inc. All rights reserved.)

CHOROIDAL NEOVASCULARIZATION (CNV) AND CYstoid macular edema (CME) are well-recognized complications of inflammatory eye disease and important causes of vision loss in uveitis.[1–9] Although the pathogenesis is incompletely understood, disruption of the inner and outer blood-ocular barriers, as well as the release of inflammatory mediators by leukocytes and macrophages, may trigger accumulation of intraretinal fluid or neovascularization. In neovascular age-related macular degeneration (AMD) and diabetic or pseudophakic macular edema, vascular endothelial growth factor (VEGF) is a principal mediator of angiogenesis and increased vascular permeability.[10–12] Since similar mechanisms likely apply in inflammatory disease, treatments that are effective for CNV or CME associated with common retinal disorders may also be effective for CNV and CME in uveitis patients.

Clinicians have employed a variety of methods to treat uveitic CNV and CME. In the case of CNV, laser photocoagulation, photodynamic therapy (PDT), local or systemic corticosteroid administration, and surgical removal have been attempted.[13–18] For CME, topical and systemic nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroids (topical, local, or systemic), systemic carbonic anhydrase inhibitors, and somatostatin analogs have been reported.[19,20] All of these therapies, however, are associated with potential limitations, such as patient unresponsiveness, or high recurrence rates.

Bevacizumab (Avastin; Genentech Inc, South San Francisco, California, USA), a monoclonal antibody to VEGF, has been successfully used to treat CNV and CME secondary to AMD, myopia, and central retinal vein occlusion.[21–23] Its efficacy in these settings, as well as the established link between uveitis and increased intraocular VEGF levels,[24] has prompted clinicians to use bevacizumab to manage uveitic CNV and CME. In order to expand the available literature on this subject,[25–33] we report our experience.

METHODS

WE PERFORMED A RETROSPECTIVE CHART REVIEW OF EYES treated with intravitreal bevacizumab for uveitic CNV or CME through February 1, 2008. A computerized search of billing codes was used to identify eligible patients at the Bascom Palmer Eye Institute. Inclusion criteria consisted of a diagnosis of inflammatory CNV or CME, treatment with at least one injection of intravitreal bevacizumab, and follow-up of at least 1 month. Eyes were excluded if they had received sub-Tenon or intravitreal corticosteroids during the 12 weeks preceding bevacizumab injection. Available demographic and ophthalmic data, including Snellen best-corrected visual acuity (BCVA), slit-lamp biomicroscopy, indirect ophthalmoscopy, fluorescein angiography (FA), and optical coherence tomography (OCT), were collected at baseline and follow-up visits.

AJO.com Supplemental Material available at AJO.com.

Accepted for publication Jun 2, 2009.

From the Bascom Palmer Eye Institute, Miami, Florida.
Inquiries to McGregor N. Lott, 413 Lister Street, Waycross, GA 31501; e-mail: mcgnlott@aol.com

0002-9394/09/$36.00
doi:10.1016/j.ajo.2009.06.010

TABLE 1. Demographic and Ophthalmic Data for Patients with Choroidal Neovascularization

Patient	Age	Gender	Eye	Diagnosis	Follow-up (months)	Number of Injections	Phakic Status[a]	Prior Injections[a,b]	Active Uveitis[a]	Diabetic[a,c]	Concurrent Topical Treatment[a,b]	Concurrent Systemic Treatment[a,b]	Prior Vitrectomy[a]	CNV Location[a]
1	46	F	OS	MCP	2	1	Pseudophakic	STTA ×2	Yes	No	Prednisolone	CSA	Yes	Peripapillary
2	24	M	OS	VKH	14	1	Phakic	None	Yes	No	Prednisolone	None	No	Peripapillary
3	53	F	OD	PIC	20	2	Pseudophakic	IVTA ×2	No	No	None	None	No	Juxtafoveal
4	55	F	OD	Idiopathic panuveitis	10	5	Phakic	None	Yes	No	None	MTX, prednisone	No	Peripapillary
5	52	M	OD	MCP	5	4	Phakic	STTA ×1	Yes	No	None	Mycophenolate	No	Peripapillary
6	46	F	OS	PIC	9	2	Phakic	None	No	No	None	None	No	Subfoveal
7	54	M	OD	Serpiginous choroidopathy	28	3	Phakic	None	Yes	No	None	AZA, CSA, predisone	No	Juxtafoveal
8	56	F	OD	Sarcoid panuveitis	7	2	Phakic	IVTA ×4	Yes	Yes	None	Mycophenolate	No	Peripapillary
9	69	M	OS	Sympathetic ophthalmia	15	9	Pseudophakic	STTA ×1	Yes	Yes	Prednisolone	Mycophenolate, prednisone	No	Subfoveal
10a	7	F	OD	Idiopathic panuveitis	2	2	Phakic	STTA ×1	Yes	No	None	None	No	Extrafoveal
10b	7	F	OS	Idiopathic panuveitis	2	2	Phakic	None	Yes	No	Prednisolone	None	No	Subfoveal
11	32	F	OS	Toxocariasis	27	5	Phakic	None	No	No	None	None	No	Subfoveal
12	12	F	OS	Idiopathic panuveitis	4	1	Phakic	None	No	Yes	Prednisolone	MTX	No	Peripapillary
13	61	M	OD	Serpiginous choroidopathy	16	2	Phakic	None	No	No	None	AZA, CSA, prednisone	No	Peripapillary
14	48	M	OS	Toxoplasmosis	12	5	Phakic	None	No	No	None	None	No	Subfoveal
15a	58	F	OD	Inflammatory papillitis	6	4	Phakic	None	No	No	None	Prednisone	No	Peripapillary
15b	58	F	OS	Inflammatory papillitis	6	5	Phakic	None	No	No	None	Prednisone	No	Peripapillary
16	29	F	OS	POHS	1	1	Phakic	None	No	No	None	None	No	Subfoveal
17	38	M	OD	Idiopathic retinal vasculitis	7	1	Phakic	None	No	No	None	MTX, mycophenolate	No	Extrafoveal
18	83	M	OD	CMVR	2	1	Pseudophakic	None	No	Yes	Prednisolone	None	No	Extrafoveal
19	53	M	OD	Pars planitis/reactive arthritis	12	3	Aphakic	None	Yes	No	Prednisolone	Prednisone	Yes	Extrafoveal

AZA = azathioprine; CMVR = cytomegalovirus retinitis; CNV = choroidal neovascularization; CSA = cyclosporine A; IVTA = intravitreal triamcinolone; MCP = multifocal choroiditis and panuveitis; MTX = methotrexate; OD = right eye; OS = left eye; PIC = punctuate inner choroiditis; POHS = presumed ocular histoplasmosis syndrome; STTA = sub-Tenon triamcinolone; VKH = Vogt-Koyanagi-Harada syndrome.

[a]None of these variables statistically influenced outcomes with respect to visual acuity or macular thickness.

[b]Limited to anti-inflammatory therapies.

[c]Refers to the presence or absence of diabetes mellitus; no patients had diabetic retinopathy.