no serum from this individual. Evidence about the effects of other mutations and polymorphisms in this region suggests that a functional effect through disruption of interaction with FI is likely: the protective allele of rs800292 (621 in SCR1) results in enhanced FI cofactor activity and reduced risk of AMD. A mutation of a conserved amino acid in SCR1, G69E, has also been reported in association with AMD (Raychaudhuri et al. 2011). A mutation of CFH (P503H) which is strongly associated with AMD in Amish people alters the equivalent amino acid in SCR8 as that which P139A alters in SCR2 (Hoffman et al. 2014).

It is possible that rare mutations of CFH SCRs 1-4 are relatively common in people with early-onset or severe AMD. We would expect to find clustering of AMD cases in families that carry these mutations. The increasing use of massively parallel sequencing in other AMD research DNA collections will show whether this is the case. Developing real-world applications for advancing the understanding of inherited diseases is a challenge, but eye diseases continue to be prime targets for ‘personalized medicine’ based on the best knowledge of disease processes and individual risk.

References

Bradley DT, Zipfel PF & Hughes AE (2011): Complement in age-related macular degeneration: a focus on function. Eye 25: 683–693.

Hoffman JD, Cooke Bailey JN, D’Aoust L et al. (2014): Rare complement factor H variant associated with age-related macular degeneration in the Amish. Invest Ophthalmol Vis Sci 55: 4455-4460.

Hughes AE, Orr N, Patterson C et al. (2007): Neovascular age-related macular degeneration risk based on CFH, LOC387715/HTRA1, and smoking. PLoS Med 4: e355.

Raychaudhuri S, Iartchouk O, Chin K et al. (2011): A rare penetrant mutation in CFH confers high risk of age-related macular degeneration. Nat Genet 43: 1232–1236.

Roversi P, Johnson S, Caesar JJ et al. (2011): Structural basis for complement factor I control and its disease-associated sequence polymorphisms. Proc Natl Acad Sci U S A 108: 12839-12844.

Yu Y, Triebwasser MP, Wong EK et al. (2014): Whole-exome sequencing identifies rare, functional CFH variants in families with macular degeneration. Hum Mol Genet 23: 5283–5293.

Bacterial keratitis in a Swedish county hospital: management and clinical outcome

Sandra Aurell1 and Elisabet Granstam1,2

1AT-Center, Västmanland County Hospital, Västerås, Sweden 2Centre for Clinical Research, Uppsala University, Västmanland, Sweden 3Department of Ophthalmology, Västmanland County Hospital, Västerås, Sweden

doib: 10.1111/aos.12935

© 2015 The Authors. Acta Ophthalmologica published by John Wiley & Sons Ltd on behalf of Acta Ophthalmologica Scandinavica Foundation. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

Table 1. Identified causative agents and type of culture taken of suspected bacterial keratitis.

| Type of culture          | Total (n = 20) |
|--------------------------|---------------|
| Conjunctival smear       | n = 13        |
| Alpha-haemolytic         | 1             |
| Streptococcus +          | 4             |
| Streptococcus pneumonia  | 4             |
| Bacteroides             | 1             |
| Coagulase-negative       | n = 5         |
| Corynebacterium spp.     | 1             |
| Coagulase-negative       | 1             |
| Staphylococcus           | 1             |
| Moraxella spp.           | 1             |
| Propionibacterium        | 1             |
| Pneumococcus             | 1             |
| Staphylococcus aureus    | 1             |

The ICD-10 (International Statistical Classification of Diseases and Related Health Problems) code keratitis (H16) was used in the search of patients’ charts. Cases with corneal infiltrates (n = 159), cases with corneal epithelial defects combined with intra-ocular inflammation (n = 7) and clinical bacterial keratitis (n = 6) were included in the review. All cases included had received antibiotic treatment. In all, the study comprised 172 cases. Follow-up data were available in 120 cases, whereas final visual acuity (VA) was available and obtained in 99 cases.

Seven patients (4%) had bilateral keratitis. Gender distribution was close to 1:1 (88 women and 84 men). The age of the patients ranged from 0 to 96 years. Most patients were aged 20–39 years (40%) and 40–59 years (28%). Mean duration of subjective symptoms before diagnosis was 2.7 days (SD 2.4).

A predisposing factor was identified in 71% of the cases. Contact lens wear was the most frequent risk factor (53%) followed by corneal trauma (11%) and corneal pathology (5%). In 58% of cases, a culture was taken. Out of 106 cultures taken, 97 were conjunctival smears, seven were corneal scrapings, and two were from contact lenses. In 20 cultures (71% of corneal scrapings and 13% of conjunctival smears), a causative agent/bacterium could be identified (Table 1).

In total, 93% of the cases were treated empirically with topical levofloxacin. No
difference in choice of antibiotic treat-
ment was seen between age groups. The
antibiotic was given as monotherapy
(66%) or in combination with another
antibiotic (34%). Cycloplegics were
given in 42 cases, and topical cortico-
teroid was added during follow-up in
24 cases. Surgical adjunctive therapy
was provided in seven cases: cross-
linking (4), amniotic membrane trans-
plantation (3), conjunctival flap (1) and
evisceration (1). Two cases had both an
amniotic membrane transplantation and
underwent cross-linking. Four
patients were hospitalized due to lack of
treatment response, insufficient com-
pliance or threatening corneal perfora-
tion. A causative agent was identified
in three cases that required surgical
therapy. In the eviscerated eye, staphy-
lococcus aureus was identified in a
conjunctival smear.

Initial VA ranged from amaurosis to
Snellen 30/20. In 90% of cases, pre-
served or improved VA was observed
at the last follow-up visit. An improve-
ment in VA was seen in three of the
four patients that underwent cross-
linking.

In conclusion, the epidemiologic
data in this study are in line with
previous reports (Schaefer et al. 2001;
Bourcier et al. 2003). The majority of
cases were successfully treated empiri-
cally. Overall, observed clinical care
adhered to the AAO recommendations
(AAO 2013) including choice of first-
in-line antibiotic. However, corneal
scrapings for culture could be taken
more frequently, especially in cases of
severe keratitis.

References

American Academy of Ophthalmology
Cornea/External Disease Panel (2013): Preferred
Practice Pattern® Guidelines. Bacterial Ker-
atitis. San Francisco, CA: American Academy
of Ophthalmology. Available at:
www.aao.org/ppp.

Bourcier T, Thomas F, Borderie V, Chaumeil
C & Laroche L (2003): Bacterial keratitis:
predisposing factors, clinical and microbio-
logical review of 300 cases. Br J Ophthalmol
87: 834–838.

Neumann M & Sjostrand J (1992): Central
microbial keratitis in a Swedish city
population—a three-year prospective study in
Gothenburg. Acta Ophthalmol 70: 160–164.

Schaefer F, Bruttin O, Zografos L & Guex-
Crosier Y (2001): Bacterial keratitis: a
prospective clinical and microbiological
study. Br J Ophthalmol 85: 842–847.

Correspondence:
Sandra Aurell, MD
AT-center
Västmanland County Hospital
SE-721 89 Västerås Sweden
Tel: +46 706 390 986
Fax: +46 21 175 361
Email: sandra.aurell@htv.se

The author Granstam, Elisabet is a member of
the AAO's baylor advisory board and has received travelling
grant support plus lecture remuneration from
Novartis.

Aflibercept anti-vascular
endothelial growth factor
treatment in vitrectomized
eyes with neovascular age-related
macular degeneration

Jesse J. Jung,1,2,3 Quan V. Hoang,3
Mohammad Z. Y. Arain1 and Stanley
Chang1

1Department of Ophthalmology, Edward
S. Harkness Eye Institute, Columbia
University College of Physicians and
Surgeons, New York, NY, USA
2Vitreous Retina Macula Consultants of
New York, New York, NY, USA
3LuEsther T. Mertz Retinal Research
Center, Manhattan Eye, Ear and Throat
Institute, New York, NY, USA
doi: 10.1111/aos.12840

Editor,

Anti-vascular endothelial growth
factor (VEGF) therapy has been
shown to stabilize and improve vision in
eyes treated for neovascular age-related
macular degeneration (NVAMD)
(Schmidt-Erfurth et al. 2014), but none
of the patients in the clinical trials were
noted to have a history of prior pars
plana vitrectomy (PPV); and the clinical
question often arises whether intravit-
real anti-VEGF therapy would be less
effective in vitrectomized eyes. Previous
studies of intravitreal medications have
shown that clearance rates are faster
after previous vitrectomy (Gisladott-
tir et al. 2009). Therefore, intravitreal
anti-VEGF therapy could potentially be
less effective in vitrectomized eyes due to
decreased viscosity and increased fluid
currents leading to a decreased half-life
and access to receptors (Christoforidis
et al. 2013). We report an observational
case series of four patients who were
previously vitrectomized unilaterally,
subsequently developed treatment-naive
NVAMD and were treated with aflibe-
ercept to adequately control their disease.

We retrospectively reviewed four
patients (three female) who developed
NVAMD after prior PPV, followed for
23.8 ± 0.5 months (mean±standard
deviation) and were treated with intravit-
real aflibercept (0.5 mg/0.5 ml,
Eylea; Regeneron, Tarrytown, NY) pro-
re nata (PRN) after an initial loading
regimen of 3 monthly injections based
on spectral-domain optical coherence
tomography (SD-OCT) and clinical
findings of recurrence of disease,
defined as the presence of cystoid
macular oedema or subretinal fluid on
SD-OCT or haemorrhage on fundosco-
py seen between January 2012 and
January 2015 by a single physician
(S.C.). Their clinical histories, best
correct visual acuity (BCVA), in log-
MAR) and SD-OCT findings including
central foveal thickness (CFT) and
initial lesion type are summarized in
Table 1.

Mean age was 85 ± 5.4 years (range
81–93). On average, patients required
7.9 ± 1.0 aflibercept injections/year
(range 6.8–8.7) to avoid recurrence.
While on aflibercept treatment, BCVA
improved from 0.88 ± 0.74 (range 0.40–
2.0) to 0.64 ± 0.91 (range 0.10–2.0) at
2 years with an average improvement of
0.24 ± 0.18 (range 0.0–0.43). CFT
improved from 449.5 ± 82.0 μm (range
363–558) to 323.8 ± 89.2 μm (range
195–295) at 2 years with an average
decrease of 125.8 ± 96.0 μm (range
27–225). There was a clinical and anatomical
improvement except in Case 4, where
atrophy developed in the macula.

Case 1 of an 81-year-old female who
had undergone left eye (OS) PPV for a
macular pucker 10 years prior illustrates
a patient who received bilateral
aflibercept injections for treatment-
naive NVAMD. At diagnosis OS, SD-
OCT demonstrated a mature type 3
(retinal angiomatous proliferation) and she
received aflibercept at a rate of 8.7
injections/year OS. Five months after
diagnosis OS, her right eye (OD)
developed a type 1 choroidal neovascu-
larization (sub-retinal pigment epithe-
lium, CNV) and required an average of
4.7 injections/year OD. Interestingly,
the average frequency of PRN injec-
tions required for disease control in