Eye (2007) 21, 577–579

www.nature.com/eye

EDITORIAL

As surgeons, our view of postcataract surgery endophthalmitis prevention is still not clear

RH Trivedi and M Edward Wilson Jr

Eye (2007) **21,** 577–579. doi:10.1038/sj.eye.6702493

In this issue of *Eye*, Kamalrajah *et al*[1] report variables affecting presumed infectious endophthalmitis (PIE) after cataract surgery with intraocular lens (IOL) implantation. Two hundred and fourteen PIE cases were identified through the British Ophthalmologic Surveillance Unit reporting card system and 445 controls were collected from 13 'control centres', which were selected by a clustered stratified random sampling procedure. Multivariate regression analysis showed that the use of face masks by the scrub nurse and surgeon, and subconjuctival antibiotics were protective against PIE. Somewhat surprisingly, dedicated eye theatres and consultant grade surgeons had a higher rates of PIE than multispecialty theatre and registrar grade surgeons. The authors pointed out that more in-patients (older and sicker) were operated in dedicated eye theatres. Also, complex cataract surgeries were more likely to be operated by consultants.

The 2001 preferred practice pattern guideline sponsored by the American Academy of Ophthalmology has stated that because of the inconclusive evidence on the risks and benefits of antibiotics, it is up to the ophthalmologist to decide whether to use topical, intracameral, or subconjunctival antibiotics perioperatively.[2] In a 2002 evidence-based update on endophthalmitis, Ciulla *et al*[3] stated that subconjuctival antibiotics and antibiotic-containing irrigating solutions were of uncertain benefit based on weak and often conflicting evidence. The results of the European Society of Cataract and Refractive Surgeons (ESCRS) study of prophylaxis of postoperative endophthalmitis after cataract surgery have recently been released.[4–6] The ESCRS study, a partially masked, randomized, placebo controlled, multinational study conducted at 24 centres across Europe was designed to prospectively evaluate the prophylactic effect of intracameral cefuroxime and/or perioperative topical levofloxacin on postoperative endophthalmitis after cataract surgery. It commenced recruitment in September 2003, and by the end of 2005, approximately 16 000 patients had been recruited. Of these, 13 698 patients completed the follow-up, and the incidence of endophthalmitis in those treatment groups not receiving intracameral cefuroxime prophylaxis (23 cases in 6862 patients) was almost five times as high as that observed in the group receiving treatment (five cases in 6836 patients). Intracameral cefuroxime had such a significant beneficial effect in reducing the incidence of endophthalmitis that the ESCRS terminated recruitment for their study earlier than the anticipated project completion date.

In the current series, the authors reported that subconjunctival antibiotics provided a protective effect for PIE. There has been conflicting evidence in the literature about the benefits of subconjunctival or topical antibiotics at the close of surgery in reducing the risk of endophthalmitis (as cited in American Academy of Ophthalmology Anterior Segment Panel[2]). However, Mandal *et al*[7] reported an outbreak of seven cases of endophthalmitis in 427 cataract operations. The infections occurred over a period of 6 months, and after the surgeon had ceased to give prophylactic antibiotics during surgery. After the seventh case, the surgeon resumed the use of subconjunctival antibiotics at the end of every intraocular surgery. After that, no case of endophthalmitis was reported in 1350 subsequent cataract operations. The intraocular use of antibiotics is commonly used in US and Germany, but uncommonly in Australia and New Zealand

Department of Ophthalmology, Storm Eye Institute, Medical University of South Carolina, Charleston, SC, USA

Correspondence: RH Trivedi, Department of Ophthalmology, Storm Eye Institute, Medical University of South Carolina, 167 Ashley Avenue, Charleston, SC 29425-5536, USA
Tel: +1 843 792 6301; Fax: +1 843 792 1166.
E-mail: trivedi@musc.edu

Received: 21 May 2006
Accepted: 22 May 2006

(cited in Liesegang[8]). The survey of Ophthalmologist in the north of England favours subconjunctival antibiotics.[9] In the current series, use of an operative antibiotic (in the irrigating solution or into the capsular bag) was excluded from multivariate analysis because this occurrence was too few in number for the control. Use of intracameral *vs* subconjuctival antibiotics requires further study.

Another very important issue the authors touched on is the use of face masks. The wearing of surgical masks during an operation to prevent potential microbial contamination of the incision is a long-standing surgical tradition.[10] However, some studies have raised questions about the efficacy and cost–benefit of surgical masks in reducing surgical site infection risk (as cited in Mangram[10]). Despite acknowledging the controversy surrounding the use of masks, they are recommended by numerous operating department organizations (American Operating Room Nurses, National Association of Theatre Nurses, 1998) (as cited in Lipp and Edwards[11]). Although the risk of endophthalmitis is low, the potential consequences of this complication are so severe that even an advantage of any measure, albeit sometimes theoretical, should be utilized. Wearing a surgical face mask for cataract surgery is recommended.[12] Wear a surgical mask that fully covers the mouth and nose when entering the operating room if an operation is about to begin or already under way, or if sterile instruments are exposed. The current article is a retrospective study, and as such is limited by the inherent problems of any retrospective study (eg, recall bias, reporting bias, etc). The reported use or nonuse of face masks is based on routine practice. Even with the use of a face mask, appropriate use remains a question. Despite all of this, the use of a face mask has been shown to be protective against PIE in a multivariate analysis, and is additionally strong evidence supporting the recommendation of wearing a face mask for cataract surgery.

Another controversial area is a relationship between the incision site and PIE. In the current series, the authors did not find the type of incision as a significant factor in reducing endophthalmitis. The relevant literature offers conflicting data with regard to incision type and location, and the relationship between unsutured clear corneal tunnel incision and an increased incidence of infection after cataract surgery.[13]

A minor concern with the results of the current series is the study period. The case notification was requested between October 1999 and September 2000, whereas control notification was requested between March 2000 and August 2000. Taban *et al*[14] performed a meta-analysis of 215 studies that addressed endophthalmitis after cataract surgery and met their selection criteria. The incidence of endophthalmitis changed over time, with a significant increase since 2000 when compared with previous decades (RR 2.44, CI 2.27–2.61). It is agreed that the current series is not aimed at reporting endophthalmitis incidence; however, changing trends in incidence (along with changing trend in practice pattern) also raise suspicion that variables affecting PIE may be changing too. Further study analysing recent data may help to better answer the questions raised here.

To summarize, the authors are to be commended for well-analysed data documenting the risk factors for a rare but severe complication of cataract surgery. The potentially severe consequences of endophthalmitis hold the notion that we should continue to examine risk factors to further limit the risk of this devastating complication.

Acknowledgements

Supported in part by NIH Grant EY-14793; Grady Lyman Fund of the MUSC Health Sciences Foundation; and an unrestricted grant to MUSC-SEI from Research to Prevent Blindness Inc., New York, NY, USA. The authors have no financial or proprietary interest in any product mentioned herein.

References

1 Kamalarajah S, Ling R, Silvestri G, Sharma NK, Cole MD, Cran G *et al*. Presumed infectious endophthalmitis following cataract surgery in the UK: a case–control study of risk factors. *Eye* 2006.
2 American Academy of Ophthalmology Anterior Segment Panel. *Preferred Practice Pattern Cataract in the Adult Eye*. 2001. Online publication webpage available at: www.aao.org/education/library/ppp/index.cfm
3 Ciulla TA, Starr MB, Masket S. Bacterial endophthalmitis prophylaxis for cataract surgery: an evidence-based update. *Ophthalmology* 2002; **109**: 13–24.
4 Seal DV, Barry P, Gettinby G, Lees F, Peterson M, Revie CW, *et al*., ESCRS Endophthalmitis Study Group. ESCRS study of prophylaxis of postoperative endophthalmitis after cataract surgery: Case for a European multicenter study. *J Cataract Refract Surg* 2006; **32**: 396–406.
5 Barry P, Seal DV, Gettinby G, Lees F, Peterson M, Revie CW, ESCRS Endophthalmitis Study Group. ESCRS study of prophylaxis of postoperative endophthalmitis after cataract surgery: preliminary report of principal results from a European multicenter study. *J Cataract Refract Surg* 2006; **32**: 407–410.
6 ESCRS press release . Dublin, Ireland – 13 March 2006. http://www.escrs.org/Publications/Guidelines/EndoGuidelines_pressrelease.asp.
7 Mandal K, Hildreth A, Farrow M, Allen D. Investigation into postoperative endophthalmitis and lessons learned. *J Cataract Refract Surg* 2004; **30**: 1960–1965.
8 Liesegang TJ. Use of antimicrobials to prevent postoperative infection in patients with cataracts. *Curr Opin Ophthalmol* 2001; **12**: 68–74.

9 Gupta MS, McKee HD, Stewart OG. Perioperative prophylaxis for cataract surgery: survey of ophthalmologists in the north of England. *J Cataract Refract Surg* 2004; **30**: 2021–2022.
10 Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol* 1999; **20**: 250–278.
11 Lipp A, Edwards P. Disposable surgical face masks for preventing surgical wound infection in clean surgery. *The Cochrane Database of Systematic Reviews* 2002, Issue 1. Art. No.: CD002929. DOI: 10.1002/14651858.CD002929.
12 Alwitry A, Jackson E, Chen H, Holden R. The use of surgical facemasks during cataract surgery: is it necessary? *Br J Ophthalmol* 2002; **86**: 975–977.
13 Lundstrom M. Endophthalmitis and incision construction. *Curr Opin Ophthalmol* 2006; **17**: 68–71.
14 Taban M, Behrens A, Newcomb RL, Nobe MY, Saedi G, Sweet PM *et al*. Acute endophthalmitis following cataract surgery: a systematic review of the literature. *Arch Ophthalmol* 2005; **123**: 613–620.