In their article published this month, “Phacoemulsification cataract surgery in a large cohort of diabetes patients” Ostri et al. evaluated cataract surgery outcomes among diabetic patients using data from the Danish National Patient Registry. The authors conducted a retrospective cohort study to assess changes in visual acuity and degree of diabetic retinopathy in 285 type 1 and 2 diabetic patients who underwent cataract surgery from 1999 to 2008. Best corrected visual acuity (BCVA) increased significantly after cataract surgery regardless of the degree of pre-op non-proliferative diabetic retinopathy. Progression of diabetic retinopathy was noted in 35% of patients after cataract surgery. Post-op BCVA was positively correlated with pre-op BCVA and negatively correlated with age and the degree of pre-op diabetic retinopathy.

Given the large and growing number of diabetic patients worldwide, we commend the authors’ efforts to help clinicians decide whether cataract surgery is likely to benefit these patients. This study supports the conclusion of prior studies that a significant improvement in visual acuity can be expected with phacoemulsification cataract surgery among diabetic patients with all levels of non-proliferative diabetic retinopathy. Although other studies have tried to address this question, many have been limited by small sample size. By analyzing data from the Danish National Patient Registry, the authors were able to study cataract surgery outcomes of a large population from multiple centers over an 8-year period, increasing the generalizability of their results. Standardization was improved by evaluating diabetic retinopathy and macular edema of all patients pre- and post-op at a single diabetes center.

There are, however, limitations in both the study design and the conclusions reached from the data. Although the authors drew their data from a prospectively collected database, the study was a retrospective observational analysis. As the authors acknowledge, documentation of some important clinical information was not available, including pre-op degree of cataract,
Visual acuity outcomes and prognostic factors

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Phacoemulsification cataract surgery in a large cohort of diabetes patients: Visual acuity outcomes and prognostic factors
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Purpose: To assess visual acuity outcomes after phacoemulsification cataract surgery in a large population of diabetic patients with all degrees of diabetic retinopathy.

Setting: Diabetology and ophthalmology unit, Copenhagen, Denmark

Design: Cohort study

Methods: This review of prospectively collected data comprised patients who had small-incision phacoemulsification cataract surgery between 1999 and 2008 (10 years) according to the Danish National Patient Registry.

Results: Data of 7,323 diabetic patients were reviewed. Of these patients, 285 had cataract surgery. The corrected distance visual acuity (CDVA) increased significantly after cataract surgery (P<.001; P<.05 in all diabetic retinopathy categories). The post-operative CDVA outcome was positively correlated with pre-operative CDVA and negatively correlated with the degree of diabetic retinopathy and age (P<.001). Patients with a history of focal laser treatment for clinically significant macular edema had a higher risk for not gaining from cataract surgery (P=.04; relative risk, 1.6). In post hoc analysis, the proportion of patients in the cohort without diabetic retinopathy appeared to increase the year before cataract surgery (P=.03) and decrease the year after cataract surgery (P<.001).

Conclusions: The CDVA increased significantly after phacoemulsification cataract surgery in diabetic patients regardless of the degree of diabetic retinopathy. The apparent progression in diabetic retinopathy after modern cataract surgery seems to reflect the masking of low grades of diabetic retinopathy by pre-operative lens opacities.

details of operative techniques, and intraoperative complications. The long period of analysis from 1999 to 2008, while allowing for an increased sample size, limited the standardization of patient care due to advances in methods of assessing macular edema and techniques of cataract surgery.

One question the authors hoped to answer is whether diabetic retinopathy increases after cataract surgery. Here, they reported progression of diabetic retinopathy in 35% of patients following cataract surgery. However, there is no age-matched control of diabetic patients to compare post-op progression of retinopathy with the natural history of the disease.

The grading system used for retinopathy classification differed from that used in the Early Treatment of Diabetic Retinopathy Study (ETDRS) and the Diabetes Control and Complications Trial (DCCT). We have some specific concerns with the grading system applied. First, the presence of hard exudates in the current study placed an eye in the moderate/severe category, whereas in ETDRS and DCCT, hard exudates in the presence of microaneurysms were considered mild non-proliferative diabetic retinopathy (NPDR). Hard exudates are not a good marker of retinopathy severity as they may actually appear or increase as macular edema is resolving. Second, severe retinal hemorrhages in four quadrants would be classified as mild in the current study, but as severe NPDR in ETDRS and DCCT. These patients, at risk for progression to proliferative diabetic retinopathy (PDR), would not be identified in the current study. To better understand how this classification system affected the reported rate of progression, it would have been helpful if the authors had provided data about the percent of patients in each category pre- and post-op.

Interestingly, the authors ultimately concluded that the observed worsening of retinopathy following cataract surgery is actually “pseudo-progression,” attributable to improved visualization of previously existing retinopathy following lens extraction. Although speculative, this conclusion seems reasonable.

The authors reported a 4% incidence of post-op CSME among the study group; however, as the authors pointed out, this rate is low compared to previous studies and needs to be interpreted with caution. Although macular edema is clearly defined in many of the seminal studies of macular edema, these studies were undertaken prior to the development of OCT. Over the past decade, the development and implementation of OCT technology has improved our ability to detect macula edema. However, standardized OCT criteria for macular edema have not yet been developed.

A major weakness of this study is that the authors used different methods of detecting macular edema throughout the study period, such as stereo photography, two-dimensional photography, and optical coherence tomography, and did not clearly define CSME for some of these modalities. Each of these modalities has a different level of sensitivity and specificity. Photograph is less sensitive for detection of macular edema than OCT. Using hard exudates as the sole surrogate marker may inaccurately estimate the rate of development of post-op CSME. Lastly, although OCT was used in evaluation of CME for some of the study patients, the authors did not standardize their definition of macular edema using this modality.

Another element that may have contributed to the low incidence of CSME is the possible use of non-steroidal anti-inflammatory agents or steroids, which can be used in the pre-op or post-op setting to reduce the likelihood of macular edema development post-op. The authors do not comment on whether such medications were used in their study population.

Finally, the time of the post-op assessment after cataract surgery was not standardized. Although patients were required to have at least one post-op visit within 1 year following cataract surgery, data from the first post-op visit was used. Macular edema often develops after 1 to 2 months in the post-op period. Some patients may have returned for follow-up earlier, prior to the development of macular edema.

Using data from a large cohort, this study supports the common practice of performing cataract surgery on many patients with diabetic retinopathy with visually significant cataracts. It raises interesting questions about factors associated with post-op visual acuity among diabetic patients undergoing cataract surgery. Not surprisingly, the authors found that post-op visual acuity was positively correlated with pre-op BCVA and negatively correlated with degree of retinopathy and age. They also found that patients with a history of focal laser for CSME had a higher risk of not gaining BCVA after cataract surgery. Interestingly, the study did not find a correlation between level of pre-op diabetes control as measured by glycosylated hemoglobin and post-op visual acuity. This study excluded patients with prior or planned vitrectomy, active macular edema, and active proliferative diabetic retinopathy.

Future studies examining results of cataract surgery in patients who have undergone vitrectomy would help us better understand the merits of cataract surgery in these patients.

Overall, this study provides valuable information regarding visual acuity outcomes and prognostic factors in diabetic patients who underwent phacoemulsification cataract surgery. However, the study limitations, particularly the questionable grading system of diabetic retinopathy and the lack of standardization in evaluating CSME, prevent us from drawing firm conclusions. Further multicenter prospective studies involving national registry databases with standardized techniques for the assessment of CSME and diabetic retinopathy would be helpful to give compelling answers.

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