

EXTENDED REPORT

Routine monitoring of visual outcome of cataract surgery. Part 2: Results from eight study centres

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Aim: To determine whether monitoring of cataract outcome can be implemented as a routine activity in different hospital settings in Africa and Asia, and to assess the impact of routine monitoring.

Methods: Eight eye centres in Asia and Africa were involved in the study between 1 June and 31 December 2000. Seven centres used a specifically designed cataract surgery record form with computerised data entry and analysis (CCSRF), and one centre used a manual recording form (MCSRf). Data were used to evaluate quality of data entry, follow up after surgery, and to assess trends in the proportion of complications and visual outcome after surgery.

Findings: The reporting systems were accepted and used by all centres, and data were recorded for 5198 cataract operations. Overall, 54% of eyes were followed for 8 weeks or more and 41% for 6 months. Follow up rates varied between centres from nil to almost 100%. Visual acuity tended to improve over time. The outcome could be improved at all follow up periods by providing best spectacle correction. At 8 weeks or more follow up, surgical complications or inadequate spectacle correction accounted for 72% of the causes of poor outcome. Three centres showed a significant reduction in complication rates over the course of the 6 month study. Data entry was identified as a problem and the CCSRF software has been modified to include consistency checks to reduce data entry errors.

Conclusion: A simple system to monitor cataract outcome has been successfully field tested. The results suggest that monitoring can sensitise surgeons to quality control, which can lead to a decrease in complication rates and improved visual outcomes.

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Cataract is the world's leading cause of blindness, affecting an estimated 20 million people. Because of population growth and increased longevity, this figure is expected to increase to 50 million by the year 2020 if no additional interventions are implemented.¹ The vast majority of the cataract blind people live in the developing world, in countries with limited resources. Several studies have indicated that the long term visual outcome of cataract surgery is often far from optimal.² This can be due to concurrent sight impairing eye diseases, surgical complications, inadequate optical correction, or long term complications.^{3–4} Patients blind as a result of cataract often speak of fear of poor vision after surgery as a major reason why they do not accept surgery.^{5–6} The need to maximise visual outcome after cataract surgery is obvious and routine monitoring of outcome can be a mechanism to achieve this.^{7–9} However, a standardised tool for routine monitoring of visual outcome after cataract surgery is not (yet) available. This study describes a field test of such a tool in eight pilot centres in Africa and Asia. This study aims to identify constraints associated with the introduction of such a system, to identify the reasons for poor visual outcome, and to determine whether the process of monitoring can lead to improved outcomes.

MATERIALS AND METHODS

A total of eight eye centres in Africa and Asia participated in the study. They represented a range of settings in which cataract surgery is undertaken in developing countries—that is, outreach clinics in rural areas, eye departments in general hospitals, small local eye hospitals, and well equipped training institutions. Table 1 gives details of the surgical procedures in each centre, illustrating their diversity.

Surgical output varied from 300 to 10 000 surgeries per year. During an initial workshop with surgeons from all

participating eye units, two systems for recording data were developed: the computerised cataract surgical record form (CCSRF), and the manual cataract surgical record form (MCSRf). The former was designed for use in eye units in developing countries where there are facilities and expertise for data entry, and the latter for settings where these are not available.¹⁰

Data on patients undergoing cataract surgery for age related cataract were collected between July and December 2000. Presenting and best corrected (or pinhole) visual acuity was assessed before surgery, at discharge, and ideally at three follow up visits. Visual outcome has been categorised by the World Health Organization as good (can see 6/18), borderline (cannot see 6/18 but can see 6/60), and poor (cannot see 6/60). If presenting vision was less than 6/60 at any of the follow up visits, the major cause of poor outcome was assessed and recorded. Data were checked for consistency and, in case of doubt, entries were checked against the original case sheets.

RESULTS

Centres implemented the monitoring system in ways that were appropriate and feasible to each centre. This led to considerable differences between centres in the way the monitoring system was implemented and the data collected at each centre. The visual outcome results obtained in this study are presented to illustrate the use of the monitoring instrument. The results should not be interpreted as a standard or used to compare the very different centres participating in the study.

A total of 5198 cataract operations were recorded. At discharge 23% had good outcome, 54% borderline, and 23%

Abbreviations: CCSRF, computerised cataract surgical record form; MCSRf, manual cataract surgical record form

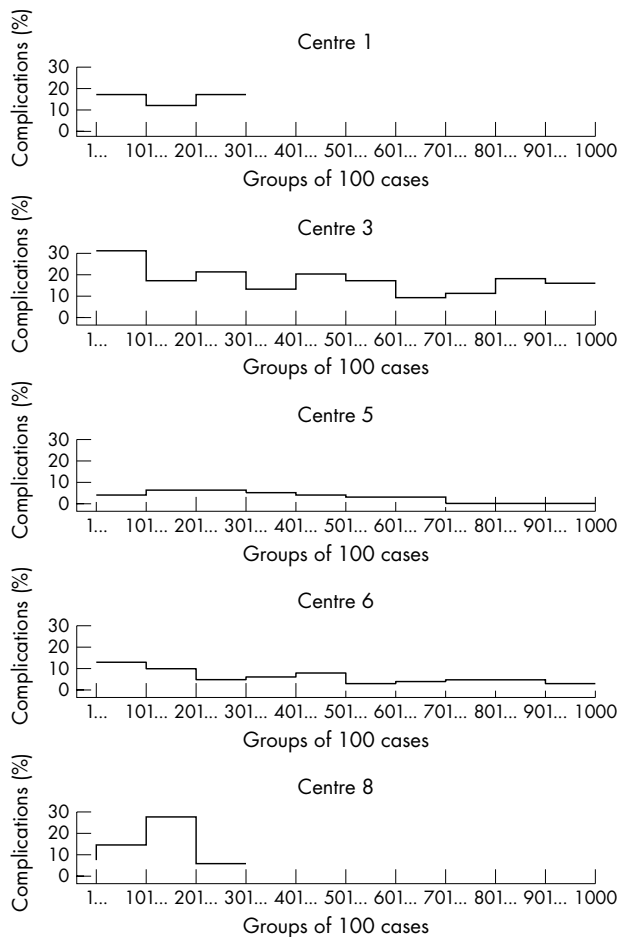


Figure 1 Change in complication rates over time. Centre 3: χ^2 test for trend=15.45, $p<0.0001$; centre 5: χ^2 test for trend=13.34, $p<0.0001$; centre 6: χ^2 test for trend=3.97, $p=0.046$.

Table 3 Results of cataract operations at discharge and at 8–25 weeks of follow up in 2819 eyes

Outcome	At discharge (n = 2819)	At 8–25 weeks follow up (n = 2819)
	%	%
Good	31	69
Borderline	52	26
Poor	17	5

poor outcome. Good outcome varied between the centres from approximately 5–40% and poor outcome from 10–60%.

The proportion of patients returning for follow up varied considerably between centres (table 2). The data include patients who returned to the clinic for follow up as well as patients visited at home as part of an operational research study. Several centres used incentives to motivate patients to come for follow up, including reimbursement of transport costs, free spectacles, or “no queue” facilities. Centre 1 visited 275 patients at home 6 months or more after surgery, increasing their 26 weeks of follow up to 80%. With few patients coming for follow up and no facilities to conduct home visits, centre 2 decided to use only discharge data for outcome monitoring. Centre 5, located in a larger city, monitored only operated patients from within the city and managed to have near 100% attendance at follow up. This increased the overall follow up rate considerably. At centre 7, there was civil unrest during the study period, causing poor attendance at follow up.

A total of 2819 eyes were followed for at least 8 weeks. The visual acuity improved over time with 31% of eyes at discharge having good outcome increasing to 69% at 8 weeks or more; and 17% eyes having poor outcome at discharge decreasing to 5% at 8 weeks or more (table 3). As an example, in centre 1, out of 73 eyes with poor outcome at discharge, 38% could see 6/18 after 8 weeks, and 54% at

Table 1 Surgical procedure by centre

Centre	ICCE		ECCE		Manual phaco			Phaco			Total	
	AC-IOL	No IOL	PC-IOL	AC-IOL	No IOL	PC-IOL	AC-IOL	No IOL	PC-IOL	AC-IOL		No IOL
1	16	1	368	15	4	15					32	454
2	16	9	399	13	18							455
3	1		798	7	164	1			20		2	993
4		3	44		56							103
5		10	394	4	297	5	1	2	757	6	164	1640
6	10	8	545	2	11	306	4	1	82	11	1	981
7		13	53	1	70							137
8	15	147	118	26	129							435

Table 2 Cataract operations by centre and follow up

Centre	Operated	Follow up 1–7 weeks		Follow up 8–25 weeks		Follow up 26+ weeks*	
		No	%	No	%	No	%
1	454	257	57	221	49	361	80
2	455	0	0	0	0	0	0
3	993	781	79	444	45	35	4
4	103	66	64	6	6	0	0
5	1640	1640	100	1640	100	1638	100
6	981	521	53	446	45	84	9
7	137	48	35	8	6	0	0
8	435	165	38	54	12	0	0
Total	5198	3478	67	2819	54	2118	41

*Includes patients who came for review on their own as well as patients who were traced and examined at home.

Table 4 Results of cataract operations by presenting and best correction at follow up

	Discharge (n = 5198)		At 1–7 week follow up (n = 3478)		At 8–25 week follow up (n = 2819)		At ≥26 week follow up (n = 2118)	
	Presenting	Best	Presenting	Best	Presenting	Best	Presenting	Best
Acuity	%	%	%	%	%	%	%	%
Good	23	47	67	69	85	93	96	
Borderline	54	39	27	26	14	5	3	
Poor	23	14	6	5	1	2	1	

Table 5 Causes of poor outcome (presenting visual acuity <6/60)

Cause of poor outcome	At 8–25 week follow up	At ≥26 week follow up
Number of eyes	143	42
Pre-existing eye disease	20%	19%
Surgical complications	17%	14%
Inadequate optical correction	55%	24%
Long term complications	8%	43%

6 months or more. Of the 206 eyes with borderline outcome at discharge, 72% could see 6/18 after 8 weeks and 86% at 26 or more weeks.

Table 4 shows that visual outcome could be improved with full optical correction. At 8–25 weeks of follow up 69% of eyes had good outcome with presenting correction but this could be improved to 85% with best correction. Similarly, 5% of eyes had poor outcome with presenting correction and this could be reduced to 1% with best correction.

The causes of poor outcome at 8–25 weeks and more than 6 months follow up are shown in table 5. Of 143 cases with poor outcome at 8–25 weeks, 17% were due to surgical complications and 55% due to inadequate optical correction.

Although the changes in complications over time of five centres are shown in one graph (fig 1), it should be noted that the facilities and characteristics of operated patients varied widely between these centres, as did the way monitoring was implemented. Three centres showed a significant reduction in the rate of surgical complications during the study period, while in other centres no trend could be demonstrated. Of all patients with poor outcome at discharge, 25.4% had complications. This is significantly more ($p < 0.0001$) than the proportion of complications in patients with borderline (4.4%) or good outcome (3.0%) at discharge.

DISCUSSION

All study centres agreed that monitoring the outcome of cataract surgery was important and useful. Three centres are still continuing with the same system, three had temporarily stopped but restarted, and two centres have changed to a more detailed outcome monitoring system. All centres indicate that it makes the surgeons more quality conscious. Two centres mentioned that some surgeons, who had surgical complications, were initially reluctant to complete the forms. It is essential to create a culture of audit and support, resulting in overall improvement and to avoid confrontation and criticism. The outcome monitoring system is intended to facilitate surgeons and centres to follow their own results over time, and it is not intended to compare individual surgeons or centres. It is also important that patients with ocular co-morbidity are not denied surgery for fear of increasing poor outcome rates.

Follow up after cataract surgery is likely to be poor in most developing countries, and efforts should be made to motivate

patients to come for review. Different centres used different ways of encouraging patients to return for follow up monitoring, depending upon the feasibility and appropriateness for the specific clinic context. This, together with other contextual constraints, led to considerable between centre differences in the proportion of patients available for follow up at different times following surgery. Free spectacles, reduced waiting periods and, in urban areas like centre 5, reminders by mail or telephone, increased follow up in the study centres.

Operated eyes with borderline or poor outcome at discharge tended to improve and reach their optimal vision at around 4–6 months after surgery. However, most study centres found that with the increase of the postoperative period, the proportion of operated patients coming for review reduced considerably. It was therefore recommended that the results are analysed in follow up periods of 1–3, 4–11, and 12 or more weeks postoperatively.

From this study 55–75% of all eyes with poor outcome at discharge had a good outcome at 6 months or more. Assuming the proportion with poor presenting vision at discharge to be less than 10%, we could expect the proportion of poor outcome to be 3–5% after 6 months.

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