OUTCOME OF CATARACT SURGERIES IN PLATEAU STATE, NIGERIA

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ABSTRACT

Aim: To evaluate the outcome of cataract surgeries in terms of restoration of visual function in the operated eye in Plateau State, Nigeria.

Method: Four centres were selected using stratified random sampling technique. Consecutive patients, who had cataract extraction from 1st October 2002 - 31st March 2003, were recruited. The study instrument was a pre-tested structured questionnaire. Preoperative visual acuity (VA), type of cataract, type of surgery, peri-operative events, postoperative events and physiological outcome were documented.

Results: Two hundred and nineteen eyes of two hundred patients were operated. Mean age was 61.08 years. Ninety seven patients (48.5%) and 183 eyes (83.6%) were blind preoperatively. One hundred and fifty six eyes (71.2%) had mature cataract, 28(12.8%) had Morgagnian cataract and 24(10.9%) had hypermature cataract. Intraoperative complications included posterior capsule rupture (14.6%), retained soft lens matter (10%), vitreous loss (8.2%). Early postoperative complications included anterior uveitis (81.2%), striate keratopathy(54.3%), epithelial oedema(23.7%). Late postoperative complications included pigments on Intraocular Lens (IOL) surface (26.1%) and mal-positioned IOL (14.3%). Six weeks after surgery, 53.4% and 73.6% of eyes had VA of ≥6/18 with available and best correction respectively.

Conclusion: The physiological outcome fell below the World Health Organisation standard; however, the outcome was encouraging as there were no facilities for ocular biometry in all centres.

Key Words: Cataract, surgery, outcome, Plateau

INTRODUCTION

Severe visual disability is one of the most disabling impairments that beset human beings

because of its wide socioeconomic implications. The prevention or treatment of this devastating disability is therefore of utmost importance to the individual, community, nation and the world at large. The World Health Organization (WHO) estimates that 37 million people are blind (best-corrected visual acuity < $^{3}/_{60}$ in the better eye) worldwide with cataract accounting for 47.8% of blindness[1]. Cataract is a leading cause of low vision in all sub-regions. Ageing is the main cause of cataract. Exponential growth of world population and life expectancy, results in an increase in the elderly population. Consequently, more people with visual loss from cataract will need eye services[1]. Eighty to ninety percent of blind people live in developing countries[2]. An estimated 9 million blind persons are in Africa, about 50% due to cataract[1.] The prevalence of blinding bilateral cataract in Africa is estimated as 0.5%[3].

In Nigeria with a population of 140 million and blindness prevalence rate of 1%, there are about 1.4 million blind people[4], another 2.8-4.2 million people are visually impaired. Cataract therefore accounts for at least 700,000 blind persons with another 1.4 – 2.1 million visually impaired by it. The only available modality of reversing blindness due to cataract is by surgical extraction and correction of resultant aphakia with spectacle lenses, contact lenses or intraocular lens implants[5].

Cataract outcome is the result of surgical intervention for visual impairment due to cataract[6]. "Physiological outcome" refers to vision in the operated eye.

In order to promote uptake of cataract surgery, it is essential that outcome of cataract surgery is made increasingly better and acceptable to patients. Satisfied operated patients serve as excellent motivators for others to have surgery thereby increasing uptake of cataract services. This will reduce the backlog of cataract blindness in Nigeria.

This study was designed to evaluate cataract surgery outcome in Plateau state, and also serve as an indicator of areas of performance that require improvement through continued professional development. This will hopefully serve as the key to improving the quantity and quality of our cataract surgeries.

AIM

To evaluate the outcome of cataract surgery in terms of restoration of visual function in the operated eye, objectively measured by visual acuity (VA). The proportion of eyes with VA of ≥6/18 (good outcome), <6/18-6/60(borderline outcome) and <6/60 (poor outcome).

METHODS

This was an observational, multicentered, prospective study in which patients with age-related cataract who had cataract extraction within a six month period (1st - October 2002 – 31st March

2003) constituted the study population. Approval was obtained to conduct the study from the Medical Ethics Committee of Jos University Teaching Hospital. An informed consent was obtained from the Medical Directors of all selected study sites and from all recruited patients.

Stratified random sampling technique was used. Cataract surgical centers were subdivided into four groups to constitute the sampling frame. Tertiary Center[1], State Government Owned Secondary Center(2), Missionary Owned Secondary Center[3], Private Hospitals[4].

One center was selected from each of the four groups by balloting. Selected centers were: Jos University Teaching Hospital (JUTH), Plateau State Specialist Hospital (PSSH), COCIN (Church of Christ in Nigeria) Hospital Mangu, Na-Allah Na-Kowa Hospital Barkin-Ladi. Based on prevalence rate of cataract blindness of 0.5%[3], estimated population of 2.78 million (estimated study population of 13900), with 15.3% of the population aged ≥40 years[7], precision ±10% and 95% confidence limit, the minimum sample size was 192 patients. Based on the rate of cataract surgery in the different centers, the numbers of patients were made up as follows: 100 patients from JUTH, 80 patients from COCIN Hospital Mangu, 10 patients from PSSH, and 10 patients from Na-Allah Na-Kowa Hospital. Consecutive cataract operated cases (case series) were recruited.

The study instrument was a pre-tested structured questionnaire. Research assistants were trained and inter-observer error assessed, corrected and standardized.

A "Case" implied a patient ≥40 years, with age-related cataract, no co-existing ocular morbidity, had cataract surgery between 1st October 2002 – 31st March 2003.

Majority of cataract develops as an ageing process and affects people of 40 years and older.

Demographic data and preoperative VA were documented. Information on rank of surgeon, type of anaesthesia, surgery and intraoperative complications were obtained from the operation notes. Patients were re-examined on the first postoperative day and 6weeks after surgery.

Refraction was done six weeks postoperatively. The presenting VA and best-corrected VA were criteria used for classifying the physiological (visual) outcome as good (≥6/18), borderline (<6/60-3/60) or poor (<3/60) based on WHO guidelines[8].

Epi-info Version 6 software was used for analysis.

RESULTS

Two hundred patients were recruited, 119(59.5%) males and 81(40.5%) females. Male:female ratio was 1.5:1. Their age ranged from 42-86 years (mean:61.08 years, SD:9.4). One

hundred and seventy-five (87.5%) were aged ≥50 years. Majority (34.5%) were farmers. Ninety-seven(48.5%) were binocularly blind and 183(83.6%) eyes were blind (table 1).

Of 219 operated eyes, 156(71.2%) had mature cataract, 28(12.8%) had Morgagnian cataract, 24(10.9%) had hyper-matured cataract (table 2).

All surgeries were performed under local anaesthesia by15 surgeons. 7(46.7%) were consultants, 4(26.7%) senior registrars, 1(6.6%) registrar and 3(20%) diplomates. One hundred and seventy-two(92.7%) eyes had Extracapsular Cataract Extraction (ECCE) and posterior chamber intraocular lens implant (PCIOL), 21(9.6%) had ECCE and anterior chamber IOL (ACIOL), 1(0.4%) had Intracapsular cataract extraction (ICCE) with ACIOL, 10(4.6%) had ECCE and 15(6.9%) had ICCE. 194(88.6%) eyes had IOL implantation while 25(11.4%) did not have IOL implant. Fifty-seven(26%) eyes had intraoperative complications, mainly posterior capsule rupture (PCR), retained soft lens matter (SLM) and vitreous loss (VL), encountered in 32(14.6%), 22(10.0%) and 18(8.2%) eyes respectively.

On the first post-operative day, 23(10.5%) eyes had good outcome (VA≥6/18), 102(46.6%) had borderline outcome (VA<6/18-6/60) and 94(42.9%) had poor outcome (VA<6/60). One hundred and fifty-one patients (161 eyes) were seen six weeks after surgery. One hundred and fifty-two (94.4%) eyes were pseudophakic, 9(5.6%) were aphakic. There was no statistically significant difference in the outcome of the two groups ($p>0.5$). One hundred and twenty patients (125 eyes) were refracted, 99(79.2%) eyes had residual postoperative astigmatism that was greater than 0.25DC. Of these, 96(97%) required correction ranging from -2.25DC to +2.25DC: 3(3%) required a correction >2.25DC. Overall, 10.5%, 53.4% and 73.6% of eyes had good physiological outcome on the first postoperative day, sixth postoperative week with available correction and best correction respectively, while 42.9%, 11.2% and 8.8% of eyes had poor outcome at the same period respectively (table 3).

Early postoperative complications included anterior uveitis, striate keratopathy and corneal epithelial oedema in 178(81.2%), 119(54.3%) and 52(23.7%) eyes respectively (table 4).

Late postoperative complications include pigments on IOL surface in 42(26.1%) eyes, malpositioned IOL 23(14.3%) and raised intraocular pressure 18(11.2%). Endophthalmitis occurred in 2(1.2%) eyes (table 5).

Causes of poor outcome after refraction were persistent corneal oedema in 4(1.8%) eyes, endophthalmitis 2(0.9%), persistent anterior uveitis 2(0.9%), ocular hypotony 1(0.4%), macular oedema 1(0.4%) and posterior capsule opacification(PCO) involving the visual axis 1(0.4%).

TABLES

Table 1: Distribution of Patient's pre-operative uniocular and binocular visual acuity

Category of Visual Acuity	Uniocular VA		Binocular VA	
	No	%	No	%
6/18 or better	2	0.9	30	15
<6/18-6/60	7	3.2	41	20.5
<6/60-3/60	27	12.3	32	16
<3/60-PL	183	83.6	97	48.5
Total	219	100	200	100

Table 2: Distribution Of Types Of Cataract Operated

Type of Cataract	No	%
Mature	156	71.2
Morgagnian	28	12.8
Hypermature	24	10.9
Posterior Subcapsular	7	3.2
Nuclear	3	1.4
Cortical	1	0.5
Total	**219**	**100**

Table 3: Physiological Outcome At 6 Weeks Post-Operative Period In Comparison With WHO Guidelines

Post-operative Visual Acuity	Available Correction (Recommended By WHO)	Best Correction (Recommended By WHO)	Available Correction (161 eyes)		Best Correction (125 eyes)	
	%	%	No	%	No	%
Good outcome (6/18 or better)	> 80	> 90	86	53.4	92	73.6
Borderline Outcome (< 6/18 – 6/60)	<15	<5	57	35.4	22	17.6
Poor Outcome (<6/60)	< 5	<5	18	11.2	11	8.8
Total	**100**	**100**	**161**	**100**	**125**	**100**

Table 4: Frequency Of Early Post-Operative Complication In 219 Eyes

	Early Post - Operative Complication (POD I)	No	%
1.	Mild-moderate anterior uveitis	178	81.2
2.	Striate keratopathy (corneal stromal oedema)	119	54.3
3.	Corneal Epithelial oedema	52	23.7
4.	Pupillary distortion	35	16
5.	Descemet folds	18	8.2
6.	Hyphaema	16	7.3
7.	Iris prolapse	10	4.6
8.	Severe anterior uveitis	7	3.2
9.	Shallow anterior chamber	6	2.7
10.	Others (e.g wound gap without iris prolapse, subconjunctival haemorrhage).	12	5.5

Table 5: Frequency Of Post-Operative Complications At Six Weeks After Surgery In 161 Eyes

	Late Post – Operative Complication	Frequency	%
1.	Pigments on IOL surface	42	26.1
2.	Malpositioned IOL	23	14.3
3.	Raised intraocular pressure	18	11.2
4.	Persistent anterior uveitis	12	7.5
5.	Persistent stromal oedema or bullous keratopathy	7	4.3
6.	Ocular hypotony	3	1.9
7.	Posterior capsule opacification	3	1.9
8.	Endophthalmitis	2	1.2
9.	Macular oedema	1	0.6
10.	Others e.g stitch abscess, glare	5	3.1

DISCUSSION

Outcome studies should not be seen as a witch-hunt of surgeons, neither should they be used to compare surgeons or centers, since case selection, surgical skills, procedures, facilities, follow-up periods and other factors affecting outcome, differ by surgeons and by centers over time. 83.6% of eyes were blind preoperatively, similar to the findings by Nwosu et al[9], and Yorton[10]. One hundred and seventy-two (78.5%) eyes had posterior chamber intraocular lens (PCIOL) implantation while 22(10%)eyes had anterior chamber intraocular lens implantation (ACIOL), close to 92.7% PCIOL and 7.3% ACIOL implantation observed by Nwosu et al[9].

Posterior capsule rupture (PCR) was the main intraoperative complication (14.6%) similar to findings by Bekibele[13], Cook[14] and Mpyet[15]. Vitreous loss rate of 10% is similar to findings of Kothari et al (7.6%)[16]. In developing countries, surgery is still done on a large number of hypermature cataracts resulting in higher incidence of surgically related complications[17].

The proportion of eyes with good outcome (10.5%) on the first postoperative day was worse than findings by Eruchalu[18] and Gurung[19] who observed 70% of eyes with borderline outcome and 69.9% with good outcome on the first post-operative day respectively.

53.4% had a good outcome with available correction. This falls below the World Health Organisation (WHO) standard[8]. It is however similar to findings by Nwosu et al[9], Bekibele[13], Adejor[20] and Cook[14] who observed 43.6%, 45.9%,

55% and 41.7% of eyes respectively with good outcome with available correction at between 2-6 months after surgery . A better outcome (78.2%) was obtained by Yorton et al [10].

Many patients at 4-8 weeks after surgery are still on cycloplegics that reduce VA.

73.6% of eyes had good outcome after over-refraction. This also falls below WHO standard. Similar findings were observed by Nwosu et al[9], Bekibele[13] and Mpyet[15] who observed 75.4%, 65.6% and 69% of eyes had good outcome after over-refraction respectively. A better outcome (94.3%) was recorded by Yorton in Kenya[10]. The prevalence of post-operative astigmatism observed in this study is similar to that (85.5%) observed by Hennig et al[21].

Uveitis was the most frequent postoperative complication (81.2%) observed in this study, similar to findings by Yorton [10] and Nwosu et al[9]. Uveitis following intra-ocular surgery may be more severe in heavily pigmented eyes[10]. Residual soft lens matter is also an important contributory factor. Striate keratopathy observed (54.3%) was similar to that recorded by Mahmoud et al (44.6%)[11]. Tilahun et al observed fewer cases(11.1%)[22]. This complication is likely related to the extent of intraoperative manipulation.

The main late postoperative complication was pigments on IOL surface (26.1%), similar to findings by Adejor [20] and Mpyet et al [23] who observed 40% and 13.3% respectively. Hyperpigmentation of the uvea in the black race could be responsible for this. 18 eyes (11.2%) had raised Intra Ocular Pressure (IOP > 20mmHg). This is higher than the 6% and 8.3% observed by Adejor[20] and Mpyet et al [23] respectively but similar to findings of Das et al[24]. Persistent stromal oedema was observed in 1.8% of eyes, lower than 4% observed by Adejor[20]. Posterior Capsular Opacification (PCO) affecting the visual axis occurred in one eye. This patient could have benefited from Nd-YAG laser which is not available in the state; however, a surgical intervention was planned. Posterior Capsular Opacification was observed in 7.3%, 4%, 3.3%, of cases in the Onitsha, Kaduna, and Jos studies respectively[9,20,23]. More of such cases could have been recorded with longer follow-up. Careful and thorough cortical clean-up, and in-the-bag Intraocular lens implantation play very important roles in the prevention of PCO[25].

A high dropout rate (24.5% at 6 weeks) was observed, similar to that recorded at Ago-Iwoye (29.5%) [13], Kaduna (26%) [11] Sierra Leone (23%) [14] and Kenya (22.4%) [10].

Poor follow-up is an identified problem in Africa[10,14]. Patient's satisfaction, financial constraints, and distance from the hospital among others are possible causes of default.

CONCLUSION

Extracapsular cataract extraction and intraocular lens implantation is the main type of cataract surgery in Plateau state. Though, the outcome fell below the World Health Organisation standard, the result is encouraging bearing in mind that facilities for ocular biometry were not available in all centres. There is an urgent need for ocular biometry and microsurgery equipments in the state.

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