OUTPUT AND VISUAL OUTCOME OF CATARACT SURGERY IN THE UNIVERSITY OF NAIROBI OUTREACH PROGRAMME AT LITEIN

A DISSERTATION PRESENTED IN PART FULFILMENT FOR THE DEGREE OF MASTER OF MEDICINE IN OPHTHALMOLOGY, UNIVERSITY OF NAIROBI.

By:

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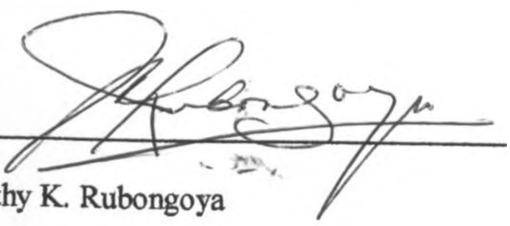
DECLARATION

THIS DISSERTATION IS MY ORIGINAL WORK AND HAS NOT BEEN PRESENTED FOR A DEGREE AT ANY OTHER UNIVERSITY

Signed: 

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APPROVAL

THIS DISSERTATION HAS BEEN SUBMITTED FOR EXAMINATION WITH OUR APPROVAL AS UNIVERSITY SUPERVISORS.

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This work is dedicated to my wife Lucy, and my son Mark for their unwavering support and understanding.

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LIST OF ABBREVIATIONS

UON	University of Nairobi
Post Op	Post Operative
ICCE	Intracapsular Cataract extraction
ECCE	Extracapsular Cataract extraction
P/C IOL	Posterior Chamber Intraocular lens
KSB	Kenya Society for the Blind
KOP	Kenya Ophthalmic Programme

1.0 INTRODUCTION

Cataract surgery was practiced by ancient Egyptian, Indian, Greek, Roman and Arab practitioners as "couching". [14] In this technique the cataractous lens was pushed backward into the vitreous, thus clearing the visual axis but it left the eye aphakic and hypermetropic .

The first documented cataract extraction was in 1745 by Daviel who made inferior limba incisions and impaled the cataract out. The main post operative complication was infection.About one hundred and twenty years later, Von Graefe introduced cataract extraction through the superior limbal incision and also did iridectomies. The technique was practiced and improved by various surgeons, who introduced the retrolental spatula extraction method, and wound closure with sutures [14].The intraocular lens was introduced successfully in 1959, by Ridley, who managed to implant acrylic lenses in the posterior chambers of aphakic eyes.1960 to 1980s saw the era of development and refinement of extra capsular cataract extraction and posterior chamber intraocular lens implantation, notably, with Kelman introducing the phacoemulsification and aspiration technique in 1970 [14].

1.1 Background Information

Cataract, defined as an opacity in the crystalline lens, causing visual impairment, is responsible for half of the world's blindness. The World Health Organization 1994 estimate on the magnitude of blindness found that an estimated 38 million people were blind in the world [18, 19].

In 1998 the W.H.O. estimates of blindness in the world showed a rise higher than previously projected, to a total of 48 million people in the world. It is estimated that there will be about 50 million blind people in the world by the year 2000. Currently there are about 20-25 million blind people in the world due to cataracts alone. Other causes include trachoma (15%), Glaucoma (15%), childhood blindness (4%), onchocerciasis (4%), Diabetic retinopathy (8%), Trauma (1%), others (6%) [21].The major causes of blindness in Africa and Asia are cataract, trachoma, corneal disease, glaucoma, vitamin A deficiency and onchocerciasis. In the Latin America the major causes are cataract, glaucoma and diabetic retinopathy, while in North America and Europe, senile macula degeneration, diabetic retinopathy and glaucoma are the leading causes [3].

The preferred cataract surgery method in Kenya is ECCE + PC IOL following short conversion courses (from ICCE + aphakic spectacles), which were sponsored in Kenya by the Fred-Hollows Foundation. These courses involved ophthalmologists and other cataract surgeons in government eye units. They were held between 1996 and 1998 [3,18,21].

In the University of Nairobi Programme, Ophthalmology starts at undergraduate level. The trainee is introduced to the basics of Ophthalmology namely anatomy of the eye, basic physiology , clinical examination of the eye, common eye diseases and their management.

The trainee is also exposed to surgical training whereby he/she observes the minor & major eye surgeries performed in the referral hospitals.

In the postgraduate training programme, the trainee ophthalmologist participates in the surgical management of the patients while under supervision. This includes the pre-operative assessment of the patients, the preparation of patients for surgery, the administration of local anaesthesia and the progressive participation in the surgeries. Cataract surgery training starts in the teaching hospital (Kenyatta National Hospital) where the post-graduate doctor acquires the basic ophthalmic surgical techniques. Further exposure and practice is acquired in the same hospital and in selected centres where the post graduate student is posted for 8 week rotations.

1.2 Problem statement

In Kenya, the survey of eye disease in 1981 estimated a blindness prevalence of 0.7% with approximately 43% of these being due to cataract, conservatively estimated as 54,180 people with cataract blindness.

This figure has increased by now as the country's population and life expectancy have increased while eye care services have not developed apace with the population increase. Current cataract blind people are estimated to be 90,000 out of a population of 30 million.

There is no known medical cure for cataracts. The only treatment for cataract is surgical extraction coupled with correction of the resultant aphakia.

Ideally, in order to arrest the annual increase of cataract blindness, the total number of cataract operations per year have to be at least equal to the incidence. Training for and

provision of cataract services is therefore a very important component of the national cataract surgical program.

1.3 Rationale

In order to stem the rise in cataract blindness, the country's cataract surgical services have to have enough trained cataract surgeons. The University of Nairobi cataract surgery training program, of which the outreach is an integral part, contributes to the development of the human resources; the ophthalmologists. This study analyses the surgical output and the visual outcome of the ophthalmologist training program.

2.0 LITERATURE REVIEW

Extracapsular cataract extraction and posterior chamber lens implantation are well established

procedures, in the developed countries, with a success rate of more than 95% [1]. This method has also

been found to be associated with fewer post-operative complications like alteration in the structure and

stability of the vitreous humour, cystoid macula oedema and retinal detachments, vis a vis ICCE. [1, 11].

Extracapsular extraction of cataract with Posterior chamber intraocular lens

implantation is an operation carried out by trained surgeons, who use special

microscopes and microsurgical

instruments.Where these operations are performed, as part of a national ophthalmic programme in Africa, both government and non-governmental organisations often have to work together to sensitise and educate the population, to initiate the programme of operations and maintain / expand it thereafter.These functions require planning, organisation and financing.Since developing countries have constraints in terms of availability of trained manpower and financial resource, it is especially important that their programmes consist of carefully selected components, to ensure they are affordable, cost effective, sustainable and acceptable to the people's culture.

In most countries in Africa the operation undertaken is intracapsular extraction of cataract, followed by aphakic correction with spectacles. This operation takes a shorter time to perform and requires simpler and cheaper equipment (operating loupes + cryoprobe) compared to ECCE which requires expensive equipment e.g. Operating microscopes. [3]

However, the visual outcome of ICCE + spectacle correction is adversely affected by poor or no use of the spectacles post operatively. Other factors which affect the visual outcome of ICCE + spectacle correction include:- distortion of images, dirty spectacles and spectacles in variable states of disrepair. e.g. scratched or cracked lenses, broken frames etc [3].

A population based study in Transvaal, South Africa found a high percentage of blindness due to uncorrected aphakia. Up to 39% of the cataract surgery patients (ICCE) had no glasses post operatively and were functionally blind. [11]

In another study done in Kwa-Zulu Natal on 113 patients who had had ICCE in free eye camps the pre and post operative blindness results showed a reduction in cataract blindness but a similar increase in uncorrected aphakia, though free aphakic glasses

were provided. Only 16 people benefited from cataract extraction results /aphakic glasses, i.e. 1%. Their corrected visual acuities were however not stated in the study. [11] A similar pattern was observed in the Nepal study where long term follow up of 234 aphakic patients revealed; 30% wore no glasses at all and only 23% wore glasses that were in good condition. The reasons for poor motivation to use glasses included, magnification, distortion, discomfort on wearing heavy glasses, no money to buy/replace glasses or to have the operation at all. Others felt if they needed glasses then their sight was very poor, "so why bother" [9]. The above mentioned reasons for poor post-cataract extraction results are obviated by Extracapsular cataract extraction + Intraocular lens implantation, (ECCE + IOL) which offers better visual outcome, no heavy glasses (which break or get dirty/lost, have magnification, distortion and ring scotomas).

In industrialized countries, between 2500 to 3500 cataract operations per million population per year are performed. In contrast/comparison, only 100 - 500 cataract operations per million population per year are performed in Africa where most countries manage to do less than 300 operations per ophthalmologist per year. In Kenya about 330 cataract operations are performed per million people per year. [3,18,21]

In Africa the reasons for low cataract operation rates include those that are provider related e.g. few human and material resources as well as low efficiency of use of human and material resources.

The other reasons are patient related and include impoverishment, isolation from health facilities due to lack of good roads, lack of transport and long distances from health facilities.

The other factors are lack of awareness about cataract surgery, and poor motivation from fear of surgery or fear of poor results of surgery [3].

Up to 42% of the blindness in Africa is due to cataracts and there is an ever-increasing backlog despite the on going efforts. Prior to 1993, most studies on ECCE plus IOL undertaking in subSaharan Africa consisted of small numbers of selected patients. The 1993 / 1994 Sierra Leone study yielded results on the evaluation of high volume ECCE plus PC IOL performed in a well equipped centre in Africa. The success rate was found to be 94.6%; 41.7% of whom had post operative visual acuity of 6/18 or better, and 27.1% with 6/18 – 6/60 uncorrected VA. The commonest complication was found to be posterior capsule rapture in 11.4 % [4].

This study showed that ECCE plus PC IOL performed in an establised centre in a developing country could have high turnover and results of satisfactory quality. Other countries in Africa have since then reverted to ECCE plus PC IOL to address the cataract blindness problem.

In Kenya, cataract surgery is an integral part of the Kenya Ophthalmic Programme.

3.1 AIMS

To evaluate the surgical output and visual outcome of the University of Nairobi cataract surgery outreach programme at Litein Mission Hospital.

3.2 OBJECTIVES

3.21 To determine the surgical output.

3.22 To determine the success rate of cataract surgery

3.23 To determine the frequency of postoperative complications.

4.0 STUDY AREA

The Litein Hospital based University of Nairobi outreach covers Bomet, Buret, Kericho and part of Kisii districts in Rift valley and Western provinces in Kenya.

Litein Hospital

This is a self-funded Mission Hospital, run by The African Inland Church, approximately 40 Km from Kericho town, and about 300 km North west of Nairobi city. Litein town is the administrative headquarters of (the new) Buret district. The hospital was started in the early 1920s,and has an eye clinic, run by a nurse, trained as an ophthalmic nurse in Tanzania.

The nurse identifies the cataract patients in the outpatient clinic and informs them of their problem and the required surgery.

The Hospital also holds outreach visits in the neighbouring districts of Bomet and Kisii where patients are screened as well. The Litein Hospital administration liaises with the Kenya Society for the Blind office in Nairobi to arrange for :

(i) The schedule for cataract operations, the dates for the camps are announced on radio.

(ii) The acquisition of I.O.L.s, eye drops and other medications required for the programme, other materials like viscoelastics, sutures and sponcels; (the consummables)

(iii) Transoprtation of personnel, and materials for the outreach programme.

(iv) Accommodation and upkeep of the surgical team.

5.0 METHODOLOGY

5.1 Study design

This was a retrospective study; Study period January - December 1998 inclusive.

5.2 Target Population; All the patients who had cataract surgery at Litein Mission Hospital in the year 1998.

5.3 Sample size. All the available cataract surgery records, in the Litein Mission Hospital eye clinic and theatre records, and KOP annual report for the year 1998

5.4 Data collection tool A proposal of this study was prepared and presented for perusal and approval, to the Department of Ophthalmology and the ethical committee, in the University of Nairobi. A data collection form was designed (see appendix) for retrospective study of the clinic and theatre records.All the available records of the cataract operations performed in the year 1998 were studied.

The author also collected more information on Litein from the Eye Health information officer at KSBoffices in Nairobi.Data collected from the O.P.D and theatre records at Litein Hospital was compared with that from the K.S.B/ K.O.P annual report, in order to improve trustworthiness of the findings i.e triangulation.

5.5 Data analysis: The data was summarised into tables and graphs then inferences were drawn from them.

5.6 The Surgical technique used in the studied programme

Basically the ECCE plus IOL technique used in the UON outreach program is as follows:-

The face and lids are aseptically cleansed and the fornices irrigated with saline. A lid speculum is inserted and the superior rectus transfixed with a silk stitch. A fornix based conjuctival flap is raised and the eye opened through limbal incision extending from 10.00 to about 2.00. Anterior capsulotomy(envelope method) is done, followed by hydro-dissection and lens matter extraction using a Simcoe irrigation / aspiration cannula. The irrigation solution used in this programme is normal saline with adrenaline since Balanced Salt Solution (BSS) is not available. The intraocular lens is implanted under a visco elastic gel and the eye is closed using 10/0 nylon sutures. A subconjuctival injection of a steroid/antibiotic combination is given, antibiotic ointment instilled and the eye padded. Variations of this method are also taught, depending on the intraoperative findings.

Visual outcome

1. Good outcome was a post operative visual acuity of 6/60 or better in the operated eye.
2. Poor outcome was a post operative visual acuity of <6/60 in the operated eye.

5.7 LIMITATIONS

1. This was a retrospective study and therefore restricted by availability and accuracy of the records. The triangulation method was used to enhance the reliability of the numbers in the studied records: for example the KOP records show a total of 347 IOLs consumed in the study period while the hospital records available for the study were 309. The theatre records show 324 operations were performed. It was assumed that 347 operations were performed and the other figures showed incomplete recording of the total operations performed. The number in the study therefore represents 95.3% of the actual total number of operations performed in the study period.
2. Preoperative assessment did not include biometry or ultrasound as these facilities were not available in the outreach programme.
3. In this programme, post-operative refraction and spectacle correction were not undertaken. The post-operative visual acuities recorded therefore were uncorrected for residual refractive error. The real success rate is probably higher than was found in this study.

5.8 *ETHICAL CONSIDERATIONS*

1. All files were confidentially handled.
2. Permission was obtained from the Litein Hospital administration for the use of files and theatre records in this study.
3. Permission was obtained, for the access to and use of the Kenya Ophthalmic Programme records.

6.0 RESULTS

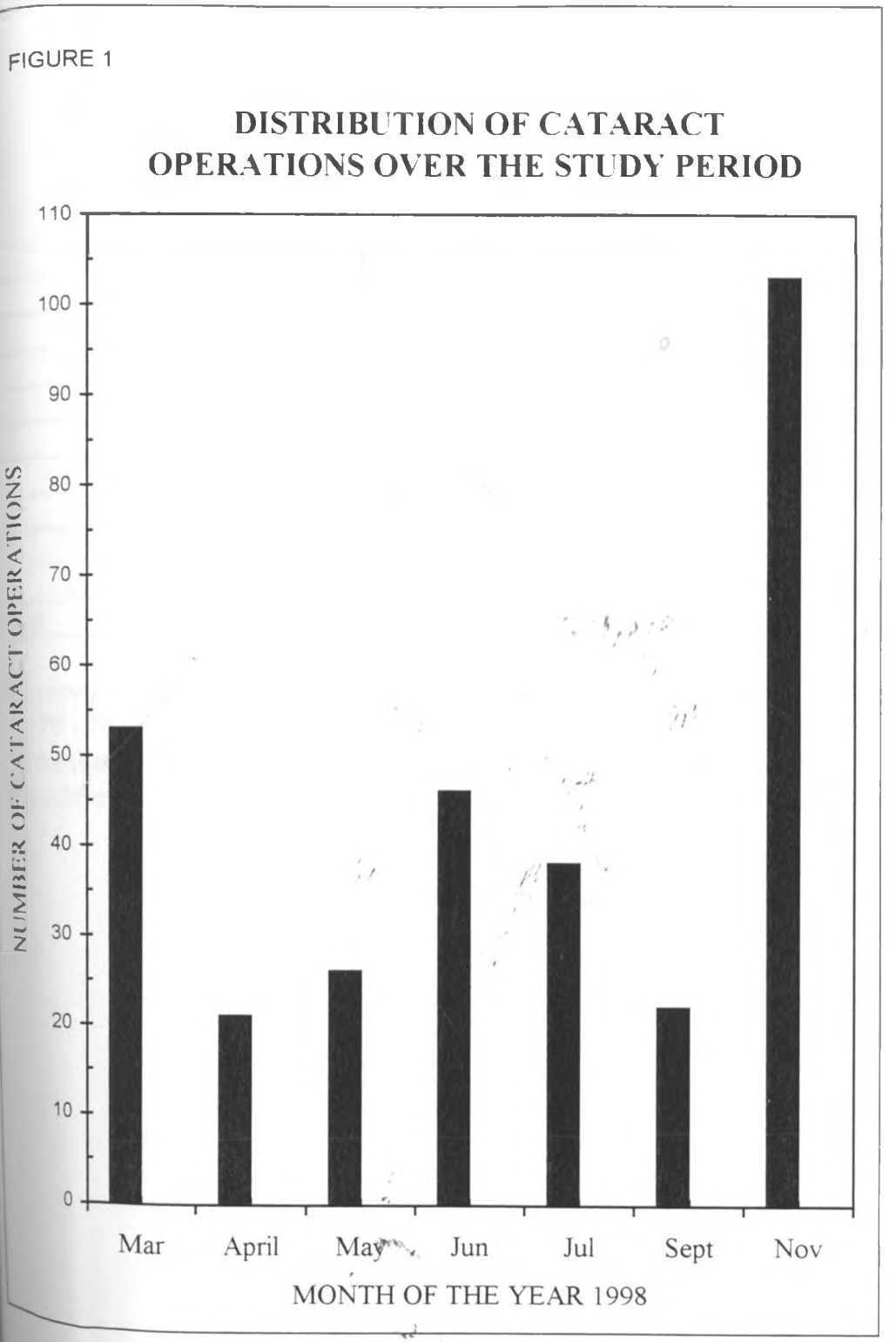
TABLE 1.

DISTRIBUTION OF CATARACT OPERATIONS OVER THE STUDY PERIC

Month	Cataract Operations
Mar	53
April	21
May	26
Jun	46
Jul	38
Sept	22
Nov	103
Total	309

There were seven surgical outreach visits to Liten Hospital in 1998.
The highest Number of cataract operation were done in November 1998;
The lowest in April. On average 44 operations were done per visit.

FIGURE 1


DISTRIBUTION OF CATARACT OPERATIONS OVER THE STUDY PERIOD
NUMBER OF CATARACT OPERATIONS
110
100
90
80
70
60
50
40
30
20
10
0
Mar
April
May
Jun
Jul
Sept
Nov
MONTH OF THE YEAR 1998

BLE 2.

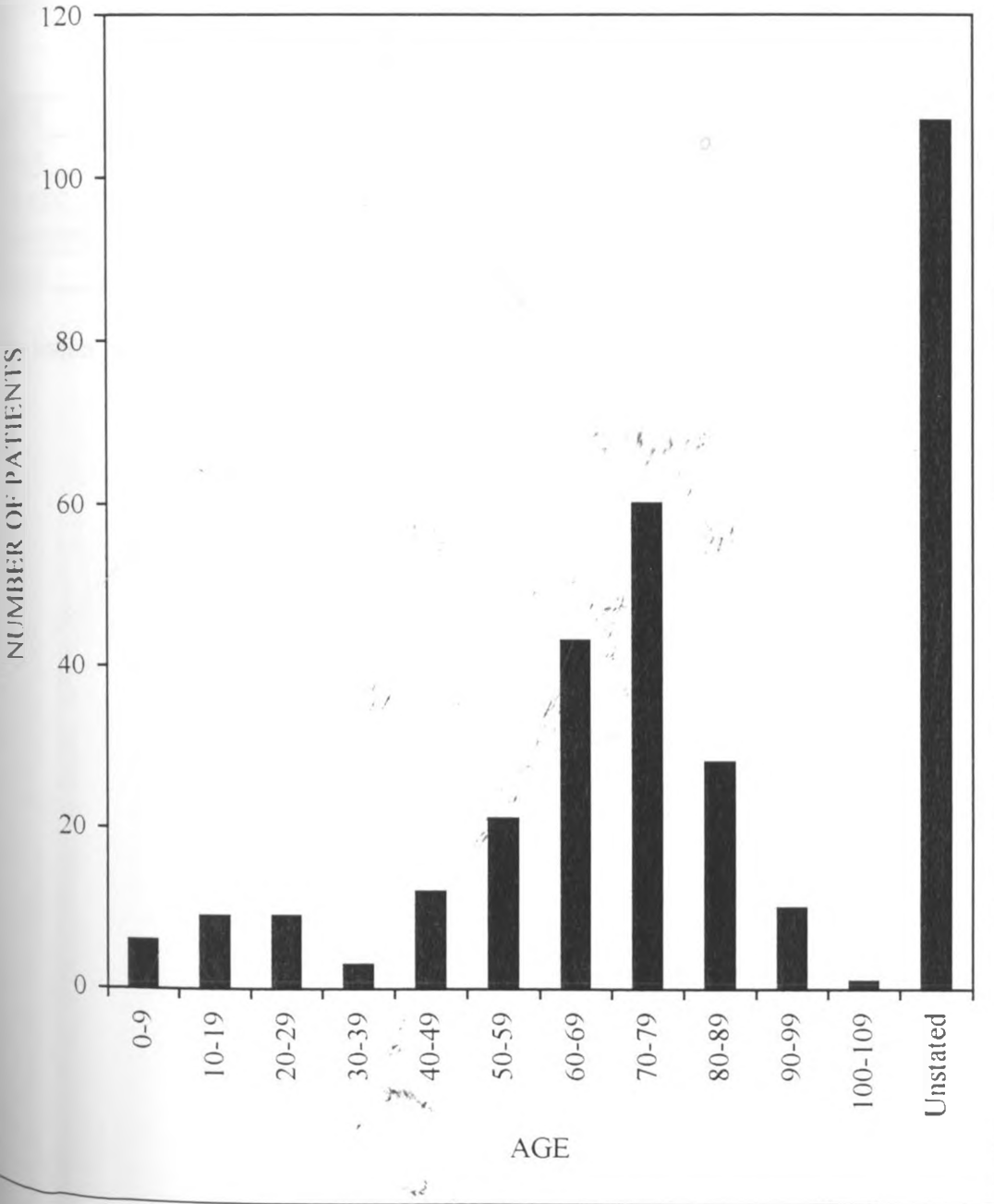
AGE DISTRIBUTION OF THE STUDY POPULATION

Age	No. of patients	Percentage (%)
0-9	6	1.8
10-19	9	2.7
20-29	9	2.8
30-39	3	0.9
40-49	12	3.3
50-59	21	6.6
60-69	43	14.0
70-79	60	19.1
80-89	28	9.4
90-99	10	3.0
100-109	1	0.3
Unstated	107	36.1
al	N =309	100%

youngest patient was aged 6 years and the oldest was 109 years old.
70 - 79 years age group was the mode group with 19% of the patients.
median age was 62.8 years.
of the record had no age indicated.

FIGURE 2

AGE DISTRIBUTION OF THE STUDY POPULATION



SUMMARY OF AGE AND SEX

TABLE 3

SEX	MEAN AGE	CASES
Male	62.59	139
Female	63.39	63
Unstated		107
Total		309

The mean age, for the population whose age was recorded, was 62.84 years.

TABLE 4

MEDICAL HISTORY

Medical condition	Absent		Present		Unstated		Total
	No.	%	No.	%	No.	%	No.
Diabetes mellitus	261	84.8	16.0	5.2	32	10.4	309
Hypertension	268	86.7	10.0	3.2	31	10	309

The two medical conditions that were recorded were diabetes mellitus and hypertension.

In 10% of the records there were no comments on diabetes or hypertension.

Majority of the patients were not known to have hypertension and / or diabetes.

E 5

PRE - OPERATIVE EXAMINATION
n = 309

ndings or status	Frequency	Percentage
ncomplicated cataract	278	90%
entral corneal opacity	6	0.2
eripheral corneal opacity	3	0.2
ild (diffuse) corneal haziness	6	2
and keratopathy	1	0.3
ealed corneal perforation	1	0.3
eratic precipitates	1	0.3
oor pupillary dilatation	2	0.6
acified anterior capsule	24	8.0
brotic anterior capsule	16	5.1
ens plate	1	0.3
seudo exfoliation	1	0.3
nstated	13	4.1

ABLE 6

PREOPERATIVE VISUAL ACUITY (OPERATED EYE)

Visual acuity	No. of eyes	Percentage
/36-6/60	123	38.9
<6/60-3/60	66	21.4
<3/60-P.L	105	34.0
NPL	2	0.6
Unstated	13	4.2
TOTAL	309	100%

TABLE 7

INTRA OPERATIVE COMPLICATIONS
N=309

	No		Yes	
Complications	No. of eyes	%	No. of eyes	%
Vitreous loss	268	86.7	41	13.3
Hyphema	303	98.1	6	1.9
Iridodialysis	209	96.8	10	3.2

The commonest intraoperative complication was vitreous loss (13.3%) followed by iridodialysis (3.2%)

TABLE 8.

VISUAL ACUITY (OPERATED EYE) - 1ST POST OPERATIVE DAY

n=309

Visual acuity	No. of eyes	%
6/60 and better	221	71.5
Less than 6/60	16	5.2
Unstated	72	23.3
Total	309	100.0

On the first day post operative, visual acuity recording was done in 237 of the op
In 71.5% visual acuity was 6/60 or better while 5.2% had visual acuity of <6/60.
visual acuity was unstated.

FIGURE 3

VISUAL ACUITY - 1ST POST OPERATIVE DAY

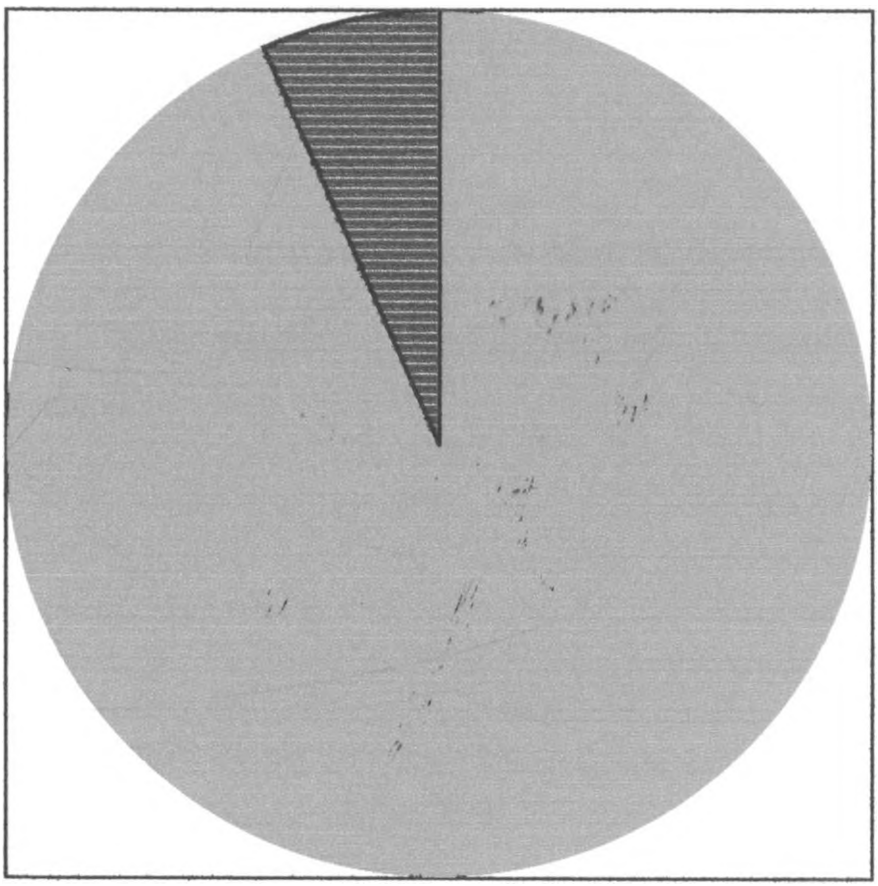


TABLE 9.

VISUAL ACUITY (OPERATED EYE) 2ND POST OP DAY

n=170

Visual acuity	No. of eyes	%
6/60 or better	156	91.8
Less than 6/60	14	8.2
Total	170	100.0

There were 170 patients whose visual acuity was recorded in the second post operative day; 91.76% of them had a visual acuity of 6/60 or better while 8.24% of the patients had visual acuity of less than 6/60

FIGURE 4

VISUAL ACUITY 2ND POST OP DAY

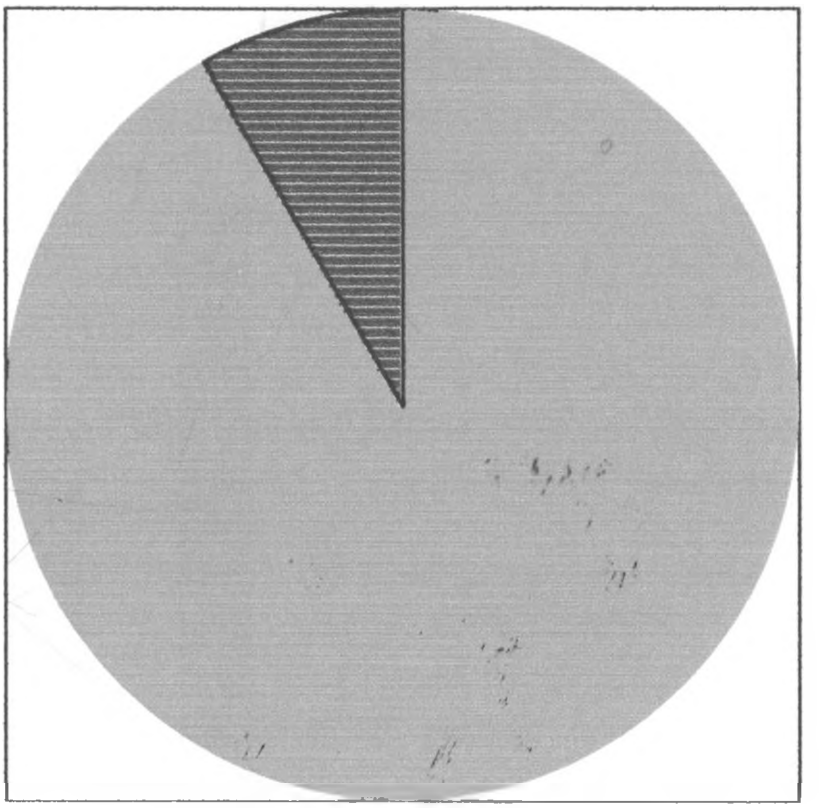


FIGURE 5

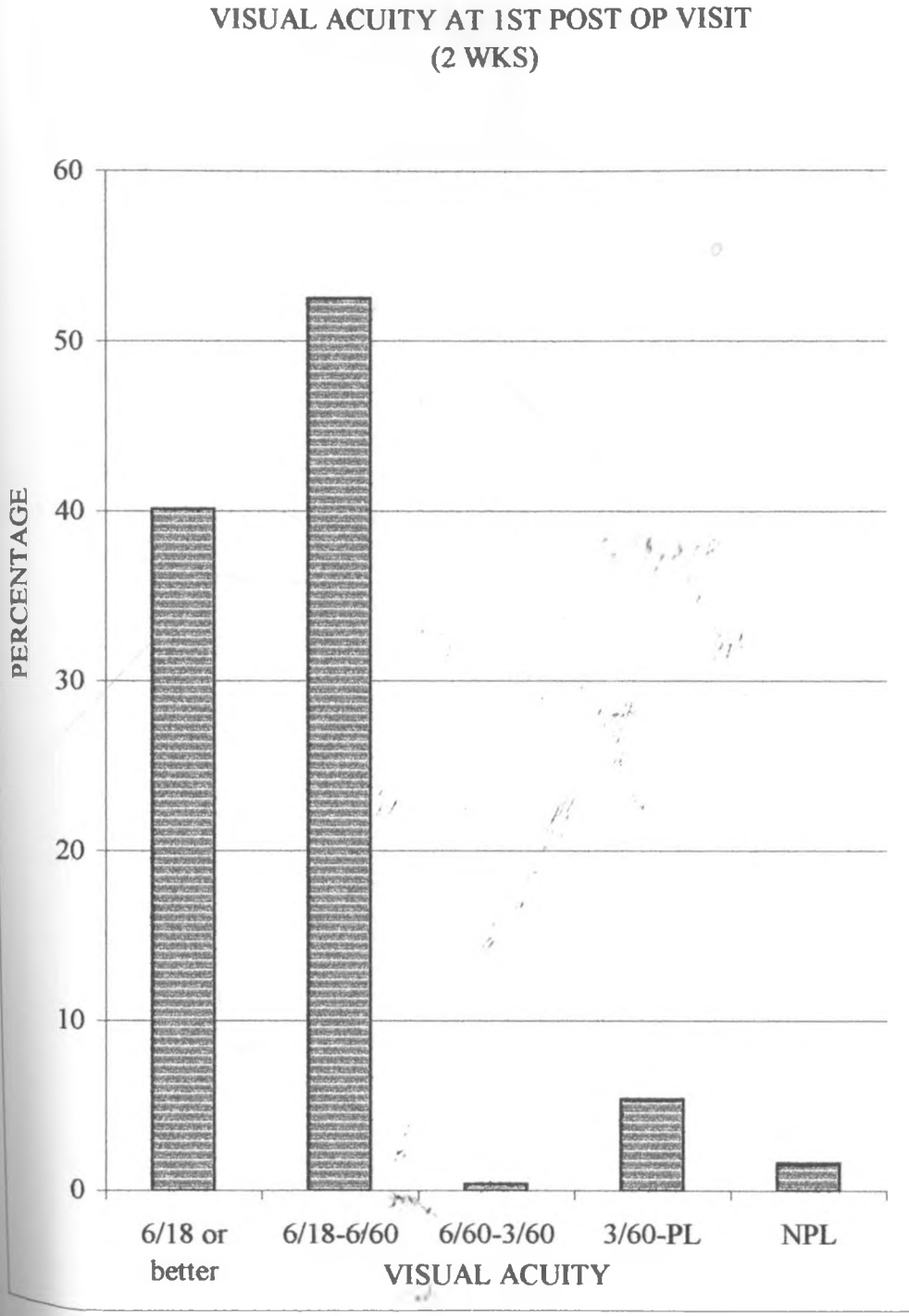

VISUAL ACUITY AT 1ST POST OP VISIT
(2 WKS)
PERCENTAGE
60
50
40
30
20
10
0
6/18 or better
6/18-6/60
6/60-3/60
3/60-PL
NPL
VISUAL ACUITY

TABLE 10

VISUAL ACUITY AT AT 1ST POST OPERATIVE VISIT
(AT 2 WEEKS)
n=242

Visual acuity	No. of eyes	%
6/18 or better	97	40.1
6/18-6/60	127	52.5
6/60-3/60	1	0.4
3/60-PL	13	5.4
NPL	4	1.6

A Total of 242 eyes were examined at 1st Post visit out of the initial 309. Good surgical outcome (VA 6/60 or better) was reported in 92.6% of the eyes examined at first post operative visit (2 weeks)

TABLE 11

VISUAL ACUITY AT 2ND POST OPERATIVE VISIT (4 WKS)

n = 108

Visual acuity (uncorrected)	No. of eyes	%
6/18 or better	35	32.4
6/18 -6/60	69	63.9
6/60 -3/60	1	0.9
3/60 -PL	0	0
NPL	3	2.8

A Total of 108 out of the initial 309 eyes were examined at the 2nd Post Op visit; of these, 96.3% of the examined eyes had good surgical outcome

(V.A. 6/60 & better).

TABLE 12

SUMMARY TABLE OF VISUAL OUTCOME

Visual acuity	Day 1 n=309	Day 2 n=170	2 wks n=242	4 wks n=108
6/60 or better	72%	92%	93%	96%
Less than 6/60	28%	8%	7%	4%

BLE 13

POST OPERATIVE COMPLICATIONS

e of complication	Ocular findings	Post operative time			
		1st day (n=309)	2nd day (n=170)	2 weeks (n=242)	4 weeks (n=108)
und leakage	Absent	92.6	75.4	25.9	7.1
	Present	4.5	2.3	1.0	0
	Unstated	2.9	22.3	73.1	92.9
ate keratitis	None	36.8	31.7	33.3	14.6
	Present	58	49.8	41.7	0
	Unstated	5.2	18.5	25.0	92.9
idual lens matter	None	96.4	74.4	70.6	15.5
	Present	3.6	2.9	3.8	2.9
	Unstated	10.0	22.7	25.6	81.6
hema	None	82.5	93.5	78.4	14.1
	Present	6.8	3.2	2.8	3.0
	Unstated	10.7	3.3	28.8	83.9
lophthalmitis	None	0	0	0	0

Y:

ures are percentages of the population of operated eyes.

DISCUSSION

Cataract which is defined as an opacity of the crystalline lens of the eye is the world's leading cause of visual impairment and blindness. It is responsible for half of the world's blindness [19] The majority of the cataracts are age -related. There is no known medical cure for cataracts; cataracts are treated by surgical removal of the opaque lens and correction of the resultant aphakia by either aphakic spectacles contact lens or implantation of an intra-ocular lens.

The major causes of blindness in Africa and Asia are cataracts, trachoma, corneal diseases, glaucoma, vitamin deficiency and onchocerciasis [19]. In Kenya, the survey of eye diseases done in 1981 estimated a blindness prevalence of 0.7% of which approximately 43% were due to cataracts. Currently the backlog of cataract blindness in Kenya stands at about 90,000 people. In Kenya, the cataracts surgery services are provided by two categories of cataract surgeons i.e. the Ophthalmologists and the clinical officer cataract surgeon [21]. There is one Ophthalmologist per million population and one clinical officer cataract surgeon per 400,000 Kenyans[21]. About 10,000 cataracts operations are done in Kenya per year. This translates to a cataract surgical rate (CSR) of 330 operations per million Kenyans per year [21]. This CSR is very low compared to Latin America's 500 - 1,500, India's approx 2000, Europe's approx. 3000 and U.S.A's 5000 [19].One way of improving the CSR is to avail more cataract surgeons. The University of Nairobi trains one category of cataracts surgeon; the ophthalmologist.

Output

From the three data sources used to determine the total output, three different figures emerged; (Table 1); The K.O.P annual report indicated that 347 IOLs were used at Litein Hospital in 1998; and average of 50 operations per visit.

From the Litein hospital eye clinic, records on 309 operated eyes were available for study. Theatre records indicated 324 ECCE + P/C IOLS operations were performed during 1998. Of the three totals, the K.O.P annual total of 347 (IOLs consumed at Litein in 1998) was assumed to be the most accurate and complete record, as no IOL wastage or theft was reported. The Litein eye clinic files represent 95.37% of the 1998 surgical output.

During the study period, there were seven outreach visits in which there were 21 trainee participation sessions, with the junior giving all the local anaesthesia, and the senior trainee operating about 25 eyes each, during each visit.

There are no figures in Kenya for direct comparison of output? since the other figures for the annual output are from established static (hospital) centres with outreach services that are run by qualified ophthalmologists.

More directly comparable are the results of the a1993/94 Sierra Leone study [4], where 1059 cataract operations were performed by qualified ophthalmologists from Kissy Eye Hospital (50%) , visiting American eye surgeons (27%) and National ophthalmologists in training (23%). The trainees performed 286 operations that year.

Patient Profile (Tables 2&3, Figure 2)

Sixty nine percent of the study population were male and 31% were female. The male to female ratio in the study population was 7:3. This however, does not represent the population structure of Kenya in which the male: female ratio is 1 : 1. From this study it is not possible to determine the exact reasons for the disparity.

Age: The age ranged from 2 years to 109 years. The mean was 66 years for male and 64 years for female. The median was 62.8 years. The mode group was 70 to 79 years. In 18.1% of the cases the stated age was less than 60 years. In 45.8% the stated age was 60 years or more. While in 36.1% the age was not recorded in years but as "A" for adults.

Studies in other tropical countries showed; In Masvingo in Zimbabwe[2] ; A population with cataracts aged from 46 to 80 years, with a mean age of 53 years, and a mode group aged 65 to 74 years. The male to female ratio was 1:1. Most of these "A" patients did not know or could not remember their age in years, but they were elderly patients. The majority of cataracts 81.9% in this study population were therefore age-related.

In the Nepal study, the male: female ratio was 1:1 in the population with cataracts. Their age ranged from 45 to 70 years with a mean age of 57 years[12]. The mode group was aged 50-59 years.

In the temperate counties the population with cataracts was aged between 69.9 and 73.5 years (mean ages were; USA 72.4 years, Denmark 73.5 years, Canada 71.7 years, Spain 69.9 years[10].

The mean age in this study (62.8 years) was higher than the mean ages of populations with cataracts in Zimbabwe, Nepal; but lower than in developed countries.

Pre-operative Assessment

Pre-operative visual acuity ranged from 6/36 to PL (Perception of Light).

Majority of the patient had severe visual impairment; 39.8% with V.A ranging between 6/36 and 6/60, 21.4% with V.A ranging between 6/60 and 3/60. The eyes that were cataract blind constituted 4.6%; 34% were < 3/60 to PL, 0.6% were query-NPL. The 2 query-NPL eyes

were operated on to give the benefit of the doubt. They remained NPL post operatively. In 4.2% of the operated eyes the visual acuity had not been recorded.

Medical diseases (Table 4), in the operated population were mainly diabetes mellitus (5.2%) and hypertension (13.2%). In each disease type, good preoperative control was established.

Preoperative examination (Table 5) revealed 90% of the cataracts had no other diseases. In 10% of the operated eyes, the other abnormal findings included mild/diffuse corneal haziness (0.2%), band keratopathy (0.3%), sealed corneal perforation (0.3%), keratic precipitates (0.3%), peripheral opacity (0.2%), central opacity (0.2%), poor pupillary reaction (0.6%).

The lens abnormalities noted preoperatively were calcification and fibrosis of the lens capsule (11%), lens plate (0.3%), pseudo exfoliation 0.3% and posterior capsule hole (0.9%). 4.1% of the studied files had no statement on pre operative findings.

Intra operative Complications (Table 6)

The commonest intraoperative complication was vitreous loss 13.3% ,followed by iridodialysis 3.2%,and hyphema 1.9%.These rates compare favourably with "the high volume study", in Sierra Leone in which the commonest complication was posterior capsule rupture in 11.4% of the cases [4].

In 5.2% of the cases, it was reported that the trainee had difficulty in IOL insertion and /or difficulty in delivering the nucleus. Even though these are not intraoperative complications, they are worth noting since they are expected in a training program.

Visual Outcome (Summary Table 11, figure 7)

First postoperative day assessment (Table 11 graph 7) revealed 71.4% of the patients had good visual outcome i.e visual acuity of 6/60 or better.

This compares well with the outcome elsewhere in developed countries. In the Moorsfield study, 1st post operative day, good visual acuity was achieved in 62.7% of the patients (243 out of 387 eyes had 6/60 or better on 1st post operative day)[1]

The 1st post operative visit was at 2 weeks (Table 9, figure 5). A total of 242 eyes were examined at visit; and of these 40.1% were reported to have hard uncorrected visual acuity of 6/18 of better and 52.5% with 6/60 – 6/18 vision. According to the WHO rating of the cataract surgery outcome, 92.5 % of the eyes examined at the first post operative visit, had good surgical outcome. The two hundred forty two eyes examined were considered a representative sample since they were not selected or in any way clustered from the original population of operated eyes. The patients attended clinic voluntarily. Their visual acuities ranged from 6/18 or better to NPL.

Th e second post operative visit was at 4 weeks (Table 10, figure 6). At this visit, 96.3% of the eyes had good surgical outcome. A total of 108 eyes were reported to have been examined .

Their visual acuities ranged from 6/18 or better to NPL. The majority of the examined eyes had visual acuities ranging from 6/60 to 6/18 (63.9 %), followed by those with acuity of 6/18 of better (32.4%). Again taking these eyes as a random and representative sample, the results show that 96.3% of the operated eyes had good surgical outcome. Pre operatively, 38.8% of the eyes were cataract blind (visual acuities <3/60 to NPL), 22.3% were severely visually impaired (visual acuities <6/60 to 3/60), and only 38.9% of the eyes had visual acuities of 6/36 to 6/60. None had visual acuity better than 6/36.

Post operatively (at 4 weeks), only 2.8% of the eyes were blind. These included the two eyes that were doubtful pre-operatively and were operated, benefit of the doubt.

Only 0.9% of the operated eyes remained severely visually impared while 96.3% had good visual outcome (6/60 or better).

Complications (Table 12)

The complication rates were low in this training programme during the study period. Wound leakage was present in 2 - 4.5% in early post operative period and none thereafter. Residual lens matter was observed in 3.8%, hyphema was observed in 6.8%. There were no cases of endophthalmitis reported. The commonest complication was striate keratitis in 58% of the eyes on the 1st post operative day. However, this showed resolution, being present in only 11% by the second postoperative visit at 4 weeks. These complication rates compare well with results from established eye centres for example, in the high volume ECCE/IOL study done in SierraLeone in 1993 the postoperative complications profile was as follows:- [4.] Uncorrected aphakia (ie no IOL implanted) 11.5%, iris prolapse 1%, pupillary inflammatory membrane 0.47%, endophthalmitis 0.47%, residual lens matter 0.38%, persistent corneal oedema 0.38%

CONCLUSION

Sixty nine percent of the population were male and 31% were female. Most of them were elderly adults of 60 years or more. There were a total of 21 exposure/participation sessions for the trainee in the UON programme during 1998. The junior trainees had ample opportunity for their initiation and subsequent practice of local anaethesia techniques required for eye surgery. The senior trainees had ample exposure/participation since each had an average of 25 cataracts operations to do on each outreach, sometimes operating well into the night. They also had a lot of clinical work to do, i.e. pre and post-operative examinations of the patients.

On average, fifty cataracts were extracted on each outreach visit to Litein, in 1998. Good surgical outcome was obtained in 96% of the operated eyes. The visual outcome of surgery in this programme met the expected international standard outcome of ECCE plus PC IOL. The post operative complications rate is low and is comparable to the rates in established eye centres.

RECOMMENDATIONS

Currently, the UON cataract outreach programme covers mainly the population in the areas surrounding Litein hospital, at a rate of 50 cataract operations per visit. This is equivalent to a maximum rate of 600 cataract operations per year. A desirable goal would be:-

(1) To increase surgical output; this can be achieved by arranging for the U.O.N team to

travel faster and more comfortably. For example, air travel to the nearest airstrip would

take one hour and by road from there to Litein would take about half an hour.

This would reduce travel time from 2 days (return) to less than half a day.

The output would also be increased if the camp lasted longer ; for example fi

days instead of two and a half days

(2) To increase the number of participating trainees.

(3) To encourage the sponsors concerned to continue supporting the outreach programme.

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ENDIX

THE QUESTIONNAIRE

STUDY ON CATARACT SURGERY OUTCOME - LITEIN A.I.C. HOSPITAL

HOSPITAL NO.:
ADMISSION DATE:
DISCHARGE DATE:

PATIEN'S NAME
SEX
AGE
RESIDENCE
OCCUPATION

EYE HISTORY:
- Vision history- Problems
  Onset and progress, ?Treatm
  Affected eye
- Any previous eye surgery
  - what
  - where
  - when
  - RE/LE
- Trauma
- Other eye disease
- How patient was referred and got to attend Litein eye clir

MEDICAL HISTORY:

Diabetes Mellitus	Yes	No	Medications
Hypertension	Yes	No	
Rheumatoid Arthritis	Yes	No	

PHYSICAL EXAM: (PRE-OP)

Visual acuity:

Right eye		Left eye
1	6/18 or better	 1
2	<6/18 - 6/60	 2
3	<6/60 - 3/60	 3
4	<3/60 - Perceive Light	 4
5	No light Perception	 5
6	Can't test believe 6/18 or better	 6
7	Can't test believe <6/18 - 3/60	 7
8	Can't test believe <3/60	 8
9	Other specify	 9

IOP Right eye Left eye

Conjuctiva
Cornea
Anterior chamber
Iris

Cataract type: Right eye Left eye

1 ..... None	.....	1
2 ..... Mainly Nuclear	.....	2
3 ..... Mainly Cortical	.....	3
4 ..... Mainly Post Subcapsular	.....	4
5 ..... Mature	.....	5
6 ..... Hypermature	.....	6
7 ..... Complicated	.....	7
8 ..... Aphakia	.....	8
9 ..... Pseudophakia	.....	9
10 ..... Other specify	.....	10

Pupillary reaction
Light projection
Vitreous
Fundus (where possible)

Intra operative

(a) Findings: Normal/abnormal
(b) Complications & procedure adopted

e.g. (a) Difficult nucleus delivery Yes No OPERATED EYE: R/L
(b) Posterior capsule rapture Yes No
(c) Vitreous loss/vitrectomy Yes No
(d) Hyphema Yes No
(e) Iridodialysis Yes No
(f) Difficult IOL insertion Yes No

		Day 1	Day 2	1st Visit	2nd Visit	3rd Visit
POST OPERATIVE VISUAL ACUITY						
CONJUCTIVA	CHEMOSIS					
	INFECTION					
	WOUND LEAK					
CORNEA	OEDEMA					
	STRIATE KERATITIS					
	OPACITY					
ANTERIOR CHAMBER:						
DEPTH:	NORMAL/SHALLOW					
	HYPHEMA					
	CORTEX MATTER					
IRIS:	PROLAPSE	+	-			

PUPILS:	SHAPE	ROUND/OVAL/IRREGULAR		
	SIZE			
	LOCATION			
	REACTION			
IOL	LOCATION	Cen/Decen		
P/C	CLARITY		+	-
VITREOUS	INFLAMMATORY CELLS		+	-
	HAEMORRHAGES		+	-

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