

# PSEUDO PHAKIC VISUAL ACUITY AFTER EXTRA CAPSULAR CATARACT EXTRACTION WITH POSTERIOR CHAMBER INTRA OCULAR LENS IMPLANTATION

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## INTRODUCTION

Cataract is the leading cause of avoidable blindness the world over.<sup>1</sup> Population survey in Dambatta local government area of Kano state in 1995 indicated a blindness prevalence of 1.2% and cataract accounted for 54% of those who were blind.<sup>2</sup> Extra capsular cataract extraction with posterior chamber intra ocular lens implantation (ECCE + PCIOL) was commenced in Aminu Kano Teaching Hospital in the year 2001. The study covered cataract surgeries done in the years 2001 to 2004. Intra ocular lens offer better post operative vision and less optical aberrations known to occur with aphakic spectacle correction. Spectacle corrections can develop scratch marks, or get broken or lost. These disadvantages are not observed in patients with PCIOL. The World Health Organization (WHO) categorized vision of 6/6 to 6/18 as normal.<sup>3</sup> The aim of cataract surgery is to remove the opacity and restore vision to normal. To determine the intra ocular lens power that will give normal vision there is need to do keratometry and A-scan. The K reading and axial length of the eye (as determined by the A-scan) are used in intra ocular lens power calculation (biometry). Absence of the equipment to do the procedure listed above does not exclude use of PCIOL, but causes limitation on choice of exact power of implant required to give the patient normal post operative visual acuity. An analysis is made on the visual outcome in 100 eyes of 100 patients who were operated for age related cataracts with PCIOL and without biometry. The aim is to determine the number and proportion of surgeries on blind eyes, to determine the number and proportion of patients who achieved normal vision (6/6-6/18) unaided, to determine the number and proportion of those who achieved normal vision with refractive correction, to determine if there is a significant difference in visual outcome of 6/6-6/18 between patients who had +19 DS and +21 DS PCIOL, and to determine the number and proportion of patients who remained blind or, severely visually impaired after surgery and why.

## Patients and Methods

The theater register was used to extract names and hospital numbers with type of cataract surgery done on patients aged 40 years and above who presented with age related cataracts. The following categories of patients were excluded: those with associated glaucoma, traumatic cataract, patients whose age was younger than 40 years, presence of corneal scar, and secondary cataracts. Out of the total number who had ECCE + PCIOL, 100 eyes of 100 patients were randomly selected using simple random numbers generated on a scientific calculator. Data was scrutinized to ensure that none of the patient's was selected twice. This information was used to trace the patient's folders. Data extracted from the

## ABSTRACT

**Background:** Manual (non phaco) extra capsular cataract extraction with posterior chamber intra ocular lens (ECCE + PCIOL) was commenced in Aminu Kano Teaching Hospital Kano in the year 2001.

**Objectives:** Firstly to evaluate the pseudo phakic visual acuity and determine the proportion of patients who attained normal vision (6/6 to 6/18) after surgery. Secondly, to determine if there is a statistically significant difference in normal visual outcome between +19 and +21 diopter sphere (the two available powers of) PCIOL.

**Patients and methods:** The theater register was used to extract names and hospital numbers with type of cataract surgery done on patients from 2001 to 2004. The following categories of patients were excluded; those with associated glaucoma, presence of corneal opacity, traumatic cataracts, secondary cataracts, and patients younger than 40 years. One hundred eyes of 100 patients with age related cataracts, with normal intra ocular pressure, briskly reacting pupils, and accurate four quadrant light projection were selected using simple random number sampling. All patients had manual (non phaco) ECCE. Information extracted from the patients records included age, sex, and visual acuity at presentation and after surgery at 3 months follow up. Visual acuity was measured with either Snellen's or, Illiterate "E" charts at 6 meters. All surgeries were done by the same surgeon.

**Results:** There were 295 patients who had ECCE+PCIOL. Fifty three patients were excluded due to co existing glaucoma, corneal opacity, anterior chamber IOL and evidence of previous eye trauma. One hundred eyes of 100 patients were selected by simple random sampling from the remaining 242 patients. There were 68 males and 32 females (M: F= 2:1). The patients age ranged between 40 and 80 years, 55% were between the ages of 50 to 60 years. Fifty three eyes had PCIOL +19 diopter sphere (DS) power and 47 had PCIOL +21 DS. Before surgery 15% of the eyes were severely visually impaired (SVI) and 85% were blind. Forty eight percent had normal vision after surgery and this improved to 69% with refraction. Twenty seven percent had post operative vision of less than 6/18 to 6/60. Two eyes remained blind after surgery due to chorioretinal scar involving the macular of the operated eye. The second patient had hypertensive retinal exudates (bilateral, with macular involvement in the operated eye). Two eyes were SVI from persistent pseudo phakic macular edema with vitreous degeneration in both eyes of one of the patient. Normal corrected visual outcome was observed in 37% and 32% of patients with +19DS and +21DS PCIOL, respectively. There was no statistically significant difference in normal visual outcome between PCIOL of +19 and +21 DS using X-squared test. ( $X^2=2.6, p<0.05$ ).

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**Keyword:** Cataract, surgery, intraocular lens,  
vision

patients record included, age, sex, visual acuity at presentation, and visual acuity at 3 months after surgery. Patients had basic eye examination before and after surgery. Intra ocular pressure was measured with applanation tonometer. Only patients with simple age related cataracts, with normal intra ocular pressure before surgery, accurate four quadrant light projection, and briskly reacting pupils were included. Surgical technique includes cleaning and draping, 4/0 bridle suture was applied, fornix based conjunctival flap was raised, superior corneo scleral incision was done, can opener capsulotomy under visco elastic, vectis nucleus delivery, irrigation and aspiration of lens cortex with Symcoe double cannula, PCIOL slotted and rotated into position under visco. Dialing was done when necessary. Wound was closed with 5 (number) interrupted 9/0 silk sutures, followed by final aspiration of visco. Subconjunctival dexamethasone (4mg) and Gentamycin (20mg) was given. The power of PC IOL was either +19 or, +21 diopter sphere (based on availability). None of the patients had biometry. The Visual acuity was measured with either Snellen's or Illiterate "E" charts. Those with post operative vision of less than 6/18 were refracted by manual retinoscopy and vision with correction recorded. All surgeries were done by the same surgeon.

### Results

There were 295 patients who had ECCE + PC IOL during the study period. Of these 13 had trabeculectomy in addition to ECCE + PCIOL, 7 had corneal opacities, 17 had anterior chamber intra ocular lens (AC IOL), and 16 had traumatic cataracts, and were all excluded. One

hundred eyes of 100 patients were selected from the remaining 242 patients. There were 68 males and 32 females given a male to female ratio of 2:1. The patient's age ranged between 40 and 80 years, with 55% aged 50 to 60 years. The surgery was done in the right eye in 48 patients and left eye in 52 patients. PC IOL power of +19 was used in 53 eyes and +21 in 47 eyes. Fifteen eyes were severely visually impaired and 85 eyes were blind before surgery. After surgery, 48% had normal vision and this improved to 69% with refraction. Of those with normal corrected post operative visual acuity 37% had +19DS and 32% had +21DS PC IOL, respectively. Twenty seven percent had post operative vision of <6/18 to 6/60. Table 1 shows the distribution of visual acuity in 100 eyes of 100 patients who had ECCE + PCIOL. Two eyes remained severely visually impaired (SVI) and 2 remained blind after surgery. The 2 blind eyes had chorioretinal scar involving the macular of the operated eye. The second patient had hypertension related retinal exudates in the posterior pole with involvement of the macula. The 2 eyes with SVI had pseudophakic macular edema with vitreous degeneration in both eyes of one of the patients. The second patient had no identifiable ocular comorbidity. These patients were managed conservatively. There was no statistically significant difference in obtaining normal visual outcome between PCIOL +19 and +21 diopter sphere using  $X^2$ -squared test ( $X^2=2.6$ ,  $p \leq 0.0$ ).

### Discussion

There are various parameters of measuring outcome of cataract surgery. However, as the aim of surgery is to restore patient's vision,

post operative (pseudophakic) visual acuity is the most important means of assessing quality of cataract surgery.<sup>4</sup> Eighty five percent (85%) of the patients were blind in the operated eye and 15% were severely visually impaired (SVI), an indication that most of the patients had mature cataracts. Patients with simple age related cataracts were evaluated to give an accurate measure of the post operative acuity and to limit interference by compounding factors such as co existing glaucoma, or corneal opacities. Forty eight percent (48%) of the eyes attained normal vision after surgery and this improved to 69% with refraction. At St Mary's hospital, Ago-Iwoye, 45.9% had normal vision and this improved to 93% with refraction.<sup>5</sup> That study involved 61 eyes of 55 patients aged 7 to 90 years. At 1 year follow up in Vietnam, in a study that involved 144 eyes, 74% had vision 6/18 or better with biometry.<sup>6</sup> The visual acuity was measured at 3 months in this study. There is tendency of vision to gradually improve with time after ECCE + PCIOL. A longer follow up period was not used because some patients do not keep longer follow up appointments unless they have complaints or, the second eye developed cataract. In a review of 116 eyes of 105 patients in Ilorin at 1 year follow up, 83.8% had 6/18 or better without biometry.<sup>7</sup> The power(s) of PCIOL used was not stated and the study covered all age groups. That study also suggested the use of +20 diopter sphere lens to achieve normal vision in the absence of biometry, though the criteria used to arrive at that conclusion was not stated. A study at ECWA eye hospital involving patients who had intra capsular cataract extraction (ICCE) without intra ocular lens implantation showed that 18% had normal post operative vision with +10 diopter sphere aphakic correction.<sup>8</sup> The proportion of those who attained normal vision could have been higher if the patients were refracted. The quality of vision is better with PCIOL, as aphakic spectacles are known to cause optical aberrations. It is the aspiration of ophthalmologists in developing countries where equipment for biometry are not available to know the power of PCIOL likely to result in obtaining normal post operative vision. In this study there is no statistically significant difference in normal visual outcome between patients who had +19 DS and those

**Table 1:** Visual acuity in 100 eyes of 100 patients before and after cataract surgery with posterior chamber intra ocular lens

WHO vision grade	Before surgery	After surgery	After surgery with refractive correction
0=6/6-6/18	0	48	69
1=<6/18-6/60	0	37	27
2=<6/60-3/60	15	13	2
3=<3/60-NPL	85	2	2
Total	100	100	100

\*Source: Manual of International Statistical Classification of Diseases Injuries and Causes of Death. Geneva. 1974; pp 46

who had +21 DS PCIOL. ( $X^2=2.6$ ,  $p \leq 0.05$ ). This indicates that there is need to do biometry to arrive at the correct power of PCIOL needed to give normal post operative vision. Two (2) patients remained blind after surgery

from hypertensive retinopathy and chorioretinal scar. There is need to consider role of systemic diseases in determining visual prognosis. Two (2) patients were SVI from pseudo phakic macular edema. In some studies

cystoid macular edema was the most common serious complication and was seen in 2.5% of patients with ICCE, and 1.7% of those who had ECCE + PCIOL.<sup>9</sup>

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