

Eliminating the barriers to uptake of cataract surgery in a resource-poor setting: A focus on direct surgical cost

O Okoye, BI Eze, CM Chuka-Okosa

Department of Ophthalmology, University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Nigeria

Abstract

Background: Cataract remains a leading cause of blindness worldwide. Despite the high therapeutic efficacy of cataract surgical interventions, surgical uptake has been sub-optimal, especially in low- and middle-income countries.

Objective: The objective was to investigate the effect of surgical fee reduction on the uptake of cataract surgical services at the University of Nigeria Teaching Hospital (UNTH) Enugu.

Methods: In a retrospective comparative study, all patients who underwent cataract surgery at UNTH between January 2008 and December 2011 were identified from the eye theatre's surgical logbook. Their clinical charts were recalled and relevant demographic and clinical data were abstracted, categorized into pre (January 2008 to December 2009, Group A), and post (January 2010 to December 2011, Group B) surgical fee reduction groups. Descriptive and comparative statistical analyses were performed.

Results: A total of 376 cataract surgeries (Group A, 164 [43.6%]; Group B, 212 [56.4%]) was performed during the 4-year study period. The surgeries were performed on 217 males, and 159 females aged 55.4 ± 23.4 standard deviation years (range, 7 months to 89 years). The average annual uptake of cataract surgery was 94 overall, 82 pre and 106 postsurgical fee reductions. The two groups did not differ significantly by age ($P = 0.8750$) or gender ($P = 0.8337$).

Conclusion: There is low uptake of cataract surgery at UNTH Enugu. Direct surgical fee reduction alone caused only a modest increase in uptake without alteration in age and gender balance. Further fee reduction and exploration of other uptake barriers are warranted.

Key words: Cataract surgery, surgical cost, uptake

Date of Acceptance: 03-Nov-2014

Introduction

Globally, the burden of visual impairment is estimated at 285 million; of these, 39 million are blind.^[1] Cataract, often of age-related etiology, is the leading cause of blindness accounting for up to 51% worldwide and more than 50% in sub-Saharan Africa.^[1,2] The population of people aged over 60 years is projected to increase from the current estimate of 400 million to about 800 million in the year 2020 due to the exponential increase in the world's population and life expectancy.^[3] This will result in a greater number of people with cataract-related visual loss that will need

cataract surgical services. In Nigeria, a report by Rabiou *et al.*^[4] put the prevalence of blindness as 0.78% overall and 5.5% among those aged 50 years or older, cataract being the leading cause of blindness accounting for 43.0% of all cases.

Blindness directly interferes with various activities of daily living and imposes developmental challenges in children. In adults, it compromises gainful employment, leisure and ability for independent living with resultant loss of status and self-esteem. The psycho-socioeconomic implications of

Address for correspondence:

Dr. O Okoye,
Department of Ophthalmology, University of Nigeria Teaching Hospital, PMB 01139, Ituku-Ozalla, Enugu, Nigeria.
E-mail: eagleobi@yahoo.com

Access this article online

Quick Response Code:



Website: www.njcponline.com

DOI: 10.4103/1119-3077.151768

PMID: 25772914

these cannot be accurately quantified in monetary terms.^[5] Cataract surgical extraction and correction of the resultant aphakia by use of spectacle lenses, contact lenses, or intraocular lens implant remains the only available modality for reversing cataract blindness.^[6] Compared with other common public health interventions, cataract surgery has been ranked as one of the most cost-effective healthcare interventions.^[5] However, in Nigeria, with over 400 Ophthalmologists, the cataract surgical rate remains low at 300.^[4] This is far lower than the WHO's target figure of 2000 for Africa.^[7] In low- and middle-income countries (LMICs) like Nigeria, poor awareness, bad surgery, cost of surgery, cultural beliefs, distance from services, lack of escort and fear have been identified as barriers to uptake of cataract surgical services.^[8-10] However, aspect-specific evidence-based data focusing on a single barrier factor especially cost are scarce. Furthermore, the majority of previous similar survey in LMICs were based on patient-reported qualitative or quantitative data.^[4,8] The questionable reliability inherent in self/patient reported data calls to question the validity of these survey findings. In January 2010, in response to the observed low cataract surgical uptake at the ophthalmology unit of the University of Nigeria Teaching Hospital (UNTH) Enugu, the UNTH's management reduced the all-inclusive fee for cataract surgery from NGN55,000.00 (393USD) to NGN18,000.00 (129USD) for walk-in adult patients, NGN60,000.00 (428USD) to NGN15,000.00 (107USD) for walk-in pediatric patients and NGN55,000.00 (393USD) to NGN10,000.00 (71USD) for outreach patients. This study performed a comparative assessment of the surgical uptake, age and gender characteristics of patients who accessed cataract surgical services at UNTH 2 years pre and postdirect cataract surgical fee reduction. The findings will provide evidence-based insight on the isolated impact of surgical fee reduction on cataract surgical uptake in a resource-poor tertiary eye care setting. In addition, the data will influence positively advocacy for significant policy review to improve the uptake of cataract surgeries especially in LMICs.

Methods

The UNTH Enugu, established in 1971 is one of the first-generation public tertiary health care institutions in Nigeria. Enugu is the administrative capital of Enugu state, one of the five component states of Nigeria's south-east geopolitical zone. UNTH's eye unit provide medical, refractive and surgical eye care services to inhabitants of Enugu state, other states in south-east Nigeria and beyond.

This study was a retrospective comparative review of cataract surgical patients who had cataract operations within 2 years preceding (January 2008 to December 2009, Group A) and 2 years immediately after (January 2010 to December 2011, Group B) cataract surgical fee reduction

at UNTH, Enugu. The eye theater's surgical logbook was used to identify all elective cataract surgical patients during the period under review. Their clinical charts were recalled and data on their number, age and sex were abstracted.

Data were entered into and analyzed using the Statistical Package for Social Sciences (SPSS), version 18 (SPSS Inc., Chicago, Illinois, USA), and reported as frequency distributions, percentages and means \pm standard deviation (SD). Statistical tests for significance of observed inter-group differences were performed using the Chi-square test for categorical variables and Student's *t*-test for continuous variables. In all comparisons, statistical significance was indicated by a $P < 0.05$.

Ethics

Ethics approval consistent with the tenets of 1964 Helsinki declaration on research involving human subjects was obtained from UNTH's Medical and Health Research Ethics Committee (Institutional Review Board).

Results

A total 376 cataract surgeries was performed during the 4-year study period. The surgeries were performed on 217 (57.7%) males and 159 (42.3%) females (sex ratio 1:0.7) who were aged 55.4 ± 23.4 SD (95% confidence interval [CI] of mean, 51.8–56.5) (range, 7 months to 89 years). The demographic characteristic of cataract surgical patients is as shown in Table 1. During the 2-year period, January 2008 to December 2009, preceding cataract surgical fee reduction, a total of 164 (43.6%) cataract surgeries was performed. These were performed on 93 (56.7%) males and 71 (43.3%) females aged 53 ± 25.2 (95% CI 49.1–56.9) (range, 7 months to 88 years) - Group A. During the 2-year period, January 2010 to December 2011, immediately after surgical fee reduction, a total of 212 (56.4%) cataract surgeries

Table 1: Age and sex distribution of 376 cataract surgical patients pre and postsurgical fee reduction

Age (years)	Sex				Total (%), n=376
	Group A, 2008-2009		Group B, 2010-2011		
	Male	Female	Male	Female	
0-10	11	12	13	9	45 (12.0)
11-20	2	0	4	2	8 (2.0)
21-30	4	8	3	2	17 (5.0)
31-40	5	2	2	2	11 (3.0)
41-50	4	8	12	6	30 (8.0)
51-60	7	12	21	16	56 (15.0)
61-70	38	10	47	31	126 (34.0)
71-80	14	15	18	17	64 (17.0)
81-90	8	4	3	4	15 (4.0)
Total (%)	93	71	123	89	376 (100)

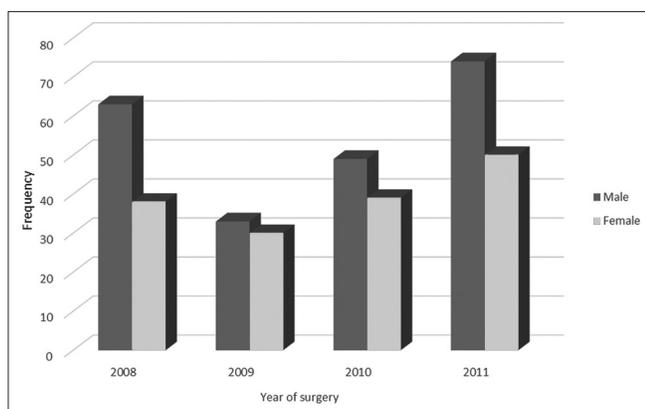


Figure 1: Distribution of cataract surgery uptake by year

were performed on 123 (58.0%) males and 89 (42%) females aged 55 ± 21.9 (95% CI 52.0–58.0) (range, 1–89 years) - Group B. The annual uptake of cataract surgery was 94 overall, 82 pre and 106 postsurgical fee reductions. The yearly distribution of cataract surgical uptake is shown in Figure 1. The pre and postsurgical fee reduction groups did not differ significantly by age (Group A vs. Group B; 53 ± 25 vs. 55 ± 21.9 , $t = 0.1579$, $P = 0.8750$) or gender (Group A vs. Group B, male:female, 93:71 vs. 123:89, $P = 0.8337$).

Discussion

The demographic data in this study showed that more males than females with a modal age group of 61–70 years accessed cataract surgical services pre and postsurgical fee reduction. Those that accessed surgery after cost reduction had a comparatively higher mean age. However, these differences are not statistically significant. Various studies on gender distribution of cataract surgical patients have reported significant male preponderance, marginal male dominance and female preponderance.^[8,11-15] Similarly, a review of previously reported data revealed a pro-male gender bias in access to cataract surgery in LMICs.^[11-14] The observed differences are likely due to socioeconomic and cultural differences between study areas/settings. In LMIC's, the prevailing socioeconomic settings characterized by unhindered male access to family finance and extension healthcare may account for this trend.^[14] In addition, as reported by Geneau *et al.*,^[16] women have poor self-esteem and low expectations and tend to cope with activity of daily living even when severely visually handicapped. This is worrisome when viewed against the backdrop of Lewallen *et al.*'s^[13] series wherein women accounted for 63.0% of all cataract cases. This study further projected that if females accessed surgery at the same rates as males, the global prevalence of cataract blindness would be reduced by a median of 12.5%.^[13] To restore gender-neutral access to cataract surgical services, the investigators suggest public eye health education, socioeconomic reorientation, grass-root

economic empowerment of women, and reduction of cataract surgical fees for females. In addition, setting-specific research sociocultural researches are urgently needed to identify and overcome gender-specific barriers to cataract surgery access.

The mean age of the study cohort is lower than 67.6 ± 9.2 years observed by Al-Orainy *et al.*^[17] in Saudi Arabia and 62.1 ± 10.5 years in Teshome *et al.*'s^[18] Ethiopian cohort. The observed age discrepancies are attributable to between-survey differences in participant's age characteristics which reflect the study specificity for particular age group. While the present study had wider participant age range 7 months to 89 years, those of Al-Orainy *et al.*,^[17] 50–96 years, and Teshome *et al.* 47–91 years,^[18] were comparatively older. The modal age in the report 61–70 years is similar to the findings elsewhere and probably reflects the age group most at risk for age – related cataract, the commonest type of cataract.^[8-10] The present age data underscore the need for eye-care planners, implementers, and eye health policy makers to deploy the necessary resources and logistics for cataract care in the elderly.

During the 4-year period under review, the total uptake of cataract study was 376; this translates to annual uptake of 94 surgeries/year. The annual uptake was higher post, 106 surgeries/year than pre, 82 surgeries/year surgical fee reduction. The overall annual uptake of 94 surgeries/year is lower than 646 reported in a similar tertiary center in Jos, Nigeria.^[19] However, the trend in uptake across surgical fee reduction could neither be compared with Jos' report^[19] nor the findings elsewhere^[8-11] as they were essentially descriptive noninterventional surveys.^[8-11,19] The present results corroborate the observation by Ezepeue^[20] and Osahon^[21] that hospital-based cataract surgical care contributes marginally to the reduction of operable cataract because at these centers socioeconomic status is a critical barrier factor in accessing ophthalmic surgical care. The cost barrier has led to gross under-utilization of available orthodox surgical eye care services. This is further evidenced by the findings of Nigerian National Blindness Survey that nearly half of those who had cataract surgery underwent traditional treatment-couching, undertaken by nonmedical healers often with poor visual outcome.^[14]

Although modest, there was an increase in cataract surgical uptake after surgical fee reduction. Several surveys have reported the dominant role of cost as a barrier to uptake of cataract surgery.^[8-10,13,16,19] These cost barriers are particularly important in LMIC like Nigeria. Several investigators have suggested reduction in the cost of supplies (consumables) and differential pricing mechanisms as ways of reducing cost of surgery.^[22,23] In view of variable effect of government

funding on surgical cost reduction particularly in the public hospital as UNTH, Ukponmwan *et al.*^[24] suggested collaboration with non-governmental organizations (NGO) in the effort to achieve significant cataract surgical fee reduction enough to stimulate and sustain optimal cataract surgical uptake.

This study utilized the uncommon opportunity provided by the reduction of cataract surgical fee by UNTH management to assess the isolated effect of surgical fee reduction on uptake of cataract surgery. However, the extrapolation of the conclusions drawn from this study is limited by its tertiary hospital setting, short study period, and small sample size. The large sample size of longer duration and multi-center design preferable involving diverse hospital/care settings is suggested.

Conclusion

Cataract surgical uptake is low at UNTH Enugu. Other barrier factors such as distance and fear of surgery held constant, reduction in direct cataract surgical cost caused only a modest increase in uptake of cataract surgery but did not significantly alter the age and gender balance in uptake to cataract surgery. Further advocacies to Government agencies, NGO, and philanthropists are needed to further reduce the direct cataract surgical cost. Future larger sample, multi-center, and cross-cadre studies are warranted.

Acknowledgments

Many thanks to the eye theater nurse of UNTH Mrs Ole MO for helping in retrieval of records of patients who had cataract surgery within the study period.

References

1. New WHO estimates of visual impairment and blindness, 2010. Available from: <http://www.who.int/blindness/en/index.html>. [Last accessed on 2014 Jan 15].
2. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegaram R, Pokharel GP, *et al.* Global data on visual impairment in the year 2002. *Bull World Health Organ* 2004;82:844-51.
3. Lewallen S, Courtright P. Blindness in Africa: Present situation and future needs. *Br J Ophthalmol* 2001;85:897-903.
4. Rabi MM, Kyari F, Ezelum C, Elhassan E, Sanda S, Murthy GV, *et al.* Review of the publications of the Nigeria national blindness survey: Methodology,

- prevalence, causes of blindness and visual impairment and outcome of cataract surgery. *Ann Afr Med* 2012;11:125-30.
5. WHO fact sheets on blindness and visual disability; 1997. Available from: <https://www.apps.who.int/inf-fs/fact>. [Last accessed on 2014 Jan 15].
 6. Roper-Hall MJ. *Stallard's Eye Surgery*. 7th ed. Michigan: Oxford Butterworth International; 1980, p. 282-332.
 7. Strategic plan for Nigeria: Vision 2020 – The Right to Sight 2007-2011. Federal Ministry of Health: Abuja; 2007. Available from: <http://www.ishtm.ac.uk/library/Msc>. [Last accessed on 2013 Feb 17].
 8. Gyasi M, Amoaku W, Asamany D. Barriers to cataract surgical uptake in the upper East region of Ghana. *Ghana Med J* 2007;41:167-70.
 9. Okoloagu NN, Shiweobi JO, Maduka-Okafor FC, Ezepue UF. Low uptake of cataract services at Enugu metropolis. *Orient J Med* 2009;21:1-8.
 10. Odugbo OP, Mpyet CD, Chiroma MR, Aboje AO. Cataract blindness, surgical coverage, outcome, and barriers to uptake of cataract services in Plateau State, Nigeria. *Middle East Afr J Ophthalmol* 2012;19:282-8.
 11. Onyekonwu CG. Uptake of ocular surgeries at Ebonyi State University Teaching Hospital (EBSUTH), Abakiliki, Nigeria. *Niger J Ophthalmol* 2008;16:39-43.
 12. Lewallen S, Mousa A, Bassett K, Courtright P. Cataract surgical coverage remains lower in women. *Br J Ophthalmol* 2009;93:295-8.
 13. Lewallen S, Courtright P. Gender and use of cataract surgical services in developing countries. *Bull World Health Organ* 2002;80:300-3.
 14. Dhaliwal U, Gupta SK. Barriers to the uptake of cataract surgery in patients presenting to a hospital. *Indian J Ophthalmol* 2007;55:133-6.
 15. Shah SP, Gilbert CE, Razavi H, Turner EL, Lindfield RJ, International Eye Research Network. Preoperative visual acuity among cataract surgery patients and countries' state of development: A global study. *Bull World Health Organ* 2011;89:749-56.
 16. Geneau R, Lewallen S, Bronsard A, Paul I, Courtright P. The social and family dynamics behind the uptake of cataract surgery: Findings from Kilimanjaro region, Tanzania. *Br J Ophthalmol* 2005;89:1399-402.
 17. Al-Oraimi AN, Anjad S, Omar A, Jahan S. Co-morbidity of age related cataract surgical patients in a tertiary care hospital in Saudi Arabia. *Saudi J Ophthalmol* 2007;21:105-9.
 18. Teshome T, Regassa K. Prevalence of pseudoexfoliation syndrome in Ethiopian patients scheduled for cataract surgery. *Acta Ophthalmol Scand* 2004;82:254-8.
 19. Odigbo OP, Babalola OE, Morgan RE. Cataract backlog and output of cataract surgery in Plateau State, Nigeria. *J Med Trop* 2010;12:4-8.
 20. Ezepue UF. The problem of cataract backlog in Anambra and Enugu States of Nigeria. A solution in community outreach services. *Niger J Ophthalmol* 1993;2:21-8.
 21. Osahon AI. Cataract surgery output and cost of hospitalization for cataract surgery in the University of Benin Teaching Hospital. *West Afr J Med* 2002;21:174-6.
 22. Lewallen S, Courtright P. Recognising and reducing barriers to cataract surgery. *Community Eye Health* 2000;13:20-1.
 23. Natchiar G, Robin AL, Thulasiraj RD, Krishnaswamy S. Attacking the backlog of India's curable blind. The Aravind Eye hospital model. *Arch Ophthalmol* 1994;112:987-93.
 24. Ukponmwan CU, Afechide OE, Uhumrangho OM. Reducing barriers to uptake of cataract surgical service in a tertiary hospital. *Orient J Med* 2010;22:1-4.

How to cite this article: Okoye O, Eze BI, Chuka-Okosa CM. Eliminating the barriers to uptake of cataract surgery in a resource-poor setting: A focus on direct surgical cost. *Niger J Clin Pract* 2015;18:333-6.

Source of Support: Nil, **Conflict of Interest:** None declared.