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Evaluation of Functional Outcomes of Cataract Surgery during a Mass Campaign at the Secondary Ophthalmology Center of Dioila

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Abstract **Original Research Article**

In an effort to reduce blindness caused by cataracts and improve the quality of cataract surgery services, an evaluation of the functional outcomes of cataract surgery during a mass campaign was conducted at the Dioila Referral Health Center, Koulikoro region, Republic of Mali. This was a prospective study involving patients who underwent cataract surgery during the mass campaign from August to October 2024. The results were analyzed using the Monitoring Cataract Surgical Outcome (MCSO) software. Among 152 operated eyes, 131 eyes were included in the study. The mean age was 67.5 years, with a median age of 63.6 years (range: 35–85 years). Manual small-incision cataract surgery (MSICS) without sutures, with posterior chamber intraocular lens implantation in 97% of cases, was the primary surgical technique used. Perioperative and postoperative complications included vitreous loss (3%), corneal edema (7.6%), and posterior capsule opacification (6.1%). The functional outcomes showed that 75.6% of patients had good visual acuity (≥3/10) without correction, 16% had borderline visual acuity (1/10–2/10), and 8.4% had poor visual acuity (<1/10). With best correction, the proportion of patients with good outcomes increased to 80.2%, while 13% had borderline visual acuity and 6.8% had poor visual acuity. Poor outcomes were attributed to pre-existing ocular comorbidities (6.9%). These results fall below WHO standards, which recommend an uncorrected visual acuity (UVA) >80% for good outcomes and a best-corrected visual acuity (BCVA) >90%, with poor outcomes below 5%. Identifying the causes of poor outcomes highlights the need for improved patient selection and long-term follow-up.

Keywords: Cataract, mass surgery, functional outcomes, Dioila Referral Health Center, Mali.

INTRODUCTION

Cataract is the total or partial opacification of the lens, usually bilateral, causing varying degrees of visual impairment [1]. It is one of the most common eye diseases worldwide and the leading cause of preventable blindness [2].

According to the WHO, at least 2.2 billion people suffer from visual impairment, of whom at least 1 billion have conditions that could have been prevented or remain untreated, including cataracts (65.2 million cases) [3].

The average prevalence of blindness is 0.7% in Eastern European countries, 0.2%–0.4% in the USA, 0.2% in France, and 1.4% in Sub-Saharan Africa [4]. In Togo, the prevalence of blindness was 1%, with more than half of cases due to cataracts [5]. In Mali, the prevalence of blindness exceeds 1.2%, with approximately 180,000 blind individuals, including 90,000 cases due to cataracts [6].

A Rapid Assessment of Avoidable Blindness (RAAB) survey conducted in 2011 in the Koulikoro region reported a blindness prevalence of 0.9%, corresponding to an estimated 14,135 blind individuals.

Untreated cataracts were identified as the leading cause of blindness (58.4%), followed by glaucoma, trachoma, and refractive errors.

The low surgical coverage rate is primarily attributed to barriers such as lack of awareness about treatment options (33.1%) and financial constraints (19.6%) [X].

To address this issue, the Koulikoro region, in collaboration with technical and financial partners, has been organizing mass cataract surgery campaigns, providing free or low-cost services to the population.

Cataract treatment is exclusively surgical, involving removal of the opacified lens (phacoextraction) and correction of the residual aphakia [6]. Various surgical techniques include:

- Extracapsular cataract extraction (ECCE)
- Phacoemulsification (PE)
- Manual small-incision cataract surgery (MSICS)

All these techniques involve intraocular lens implantation, either in the anterior or posterior chamber [7].

At the Dioila Referral Health Center (Koulikoro region, Mali) in 2023, 804 cases of cataracts were diagnosed, and 657 patients underwent surgery.

However, due to financial constraints, some diagnosed patients could not receive surgery. To address these gaps, financial partners organize free cataract surgery campaigns to ensure access to treatment for all.

The quality of cataract surgery outcomes depends on several factors:

- Availability of qualified personnel
- Adequate infrastructure and equipment
- Surgical technique used
- Patient-related risk factors, such as coexisting ocular conditions (glaucoma, age-related macular degeneration, corneal scars, etc.)

Short-term follow-up and continuous quality improvement are essential. Hence, this study aims to evaluate the functional outcomes of cataract surgery during a mass campaign at the Dioila Referral Health Center, highlighting the need for better case selection and long-term patient monitoring.

PATIENTS AND METHODS

This was a prospective study conducted over a period of three months (August to October 2024). Patients included in the study were those who underwent cataract surgery at the Dioïla Secondary Ophthalmology Center and had a postoperative follow-up of at least 45 days.

Patients were recruited during consultations. Data collection was carried out using survey forms based on a standardized protocol recommended by the WHO. Information was gathered from the consultation registry, patient records, and the surgical report register. The collected data were used to evaluate functional outcomes. These outcomes were analyzed according to the WHO guidelines and recommendations on postoperative results of cataract surgery with intraocular lens implantation established in 1998.

After the first postoperative day (D1) consultation conducted by surgeons, survey forms of patients meeting the selection criteria were collected, and the relevant information was recorded.

A total of 131 eyes were studied. These patients were followed up for 45 days, constituting our sample.

The results of cataract surgery were analyzed based on the following variables:

- Sociodemographic characteristics (age, sex, occupation, place of residence);
- Operated eye;
- Preoperative and postoperative visual acuity, both uncorrected and corrected;
- Intraoperative, early postoperative, and late postoperative complications;
- Causes of poor functional outcomes.

A software tool developed by the WHO for monitoring and evaluating cataract surgery outcomes (MCSO v2.4 – Monitoring Cataract Surgery Outcome) and SPSS were used for data entry and standardized automatic analysis.

RESULTS

A total of 152 eyes were operated on, and 131 eyes were included and followed up until D45.

Sociodemographic Characteristics of Patients

- The 60–69 age group accounted for 37.4% of the 131 operated eyes (Table I).
- Females were more represented, comprising 58% of the sample (Table II).
- Housewives constituted the majority at 51.1% (Table III).
- Most patients came from Dioïla (83.2%) (Table IV).

Preoperative Examination

- In our study, the majority of patients had light perception as their preoperative visual acuity (57.3%) (Table V).
- Bietti's corneal dystrophy was the most common ocular pathology in the operated eye, accounting for 3.8% of cases (Table VI).

Surgery

- Phacoemulsification (Phaco A) was the most performed technique, used in 96.2% of cases (Table VII).
- Most operated eyes received posterior chamber intraocular lens implantation, accounting for 97% (Table VIII).

Functional Outcomes

- Among the 131 operated eyes, 75.6% had good uncorrected visual acuity, while 8.4% had poor uncorrected visual acuity (Table IX).
- With best correction, 80.2% had good visual acuity, while 6.8% had poor visual acuity (Table X).

Intraoperative and Postoperative Complications

- Vitreous loss was the main intraoperative complication, occurring in 3% of cases (Table XI).
- Corneal edema accounted for 7.6% of early postoperative complications (Table XII).
- Posterior capsule opacification was the most common late postoperative complication, affecting 6.1% of cases (Table XIII).

Causes of Poor Functional Outcomes

- Case selection issues were the primary causes of poor functional outcomes, representing 6.9% of cases (Table IX).

DISCUSSIONS

Sociodemographic Characteristics of Patients

The average age of our patients was 67.5 years. This explains the high prevalence of cataracts in this age group due to senility. This result is comparable to those of Haidara M [8] who found 65.45 years, BALLO A [9] who found 62.97 years, and Guirou N *et al*., who found an average age of 65 years [18]. It was slightly higher than those of Traoré M T [19] in Mali and Rupert [20] in Pakistan, who found 61 years and 59.6 years, respectively.

The median age of our patients was 63.6 years, with extremes ranging from 35 to 85 years. This result is comparable to those of BALLO A, P. Widenmanegdé *et al*., Nadio T *et al*., and N. Maneh *et al*., who found 65.5%, 63.77 years, 62.47 years, 64.2 years, and 61.63 years, respectively [9, 10, 6, 11]. This could be explained by the fact that cataracts are a physiological change in the lens due to aging in most cases.

Females represented 58% of the patients with a male/female ratio of 0.72. This result is comparable to that of BALLO A [9], who found 60% females with a male/female ratio of 0.66, Harba T *et al*., in Chad, who found 55.7% females versus 44.3% males [12]. Ammous I *et al*., found 63.33% females [13]. This female predominance aligns with demographic data from Mali, where women represent 51.30% of the general population [14], but also reflects financial difficulties women face in accessing healthcare.

Housewives made up the majority of the cohort at 51.1%, followed by farmers at 31.3%. This could be explained by the high prevalence of cataracts in these groups for various reasons: ignorance and lack of financial means. This result is similar to those of Haidara M [8] with 49% housewives, Ongoïba [16] with 49.7% housewives, and higher than that of BALLO A [9] with 27.1% housewives.

The majority of the patients were from the Dioïla health district, with 83.2%. This was due to the proximity of the ophthalmological care center.

Preoperative Examination

The majority of our patients had positive light perception as their preoperative visual acuity (57.3%). This is characteristic of developing countries, where cataract surgery is often delayed for various reasons (financial constraints, fear of surgery, lack of surgeons, ignorance, absence of technical facilities, geographical inaccessibility).

This result is lower than those of BALLO A [9] (92%), Meda [21] in Burkina Faso (95%), and Fanny [22] in Côte d'Ivoire (100%). This result is similar to that of Haidara M [8] (56%). Bietti's corneal dystrophy was the most common associated ocular pathology (3.8%). This is likely due to the Sahelian climate and, especially, their profession as farmers. This result is lower than that of Haidara M [8] (5%) and similar to that of Diallo JW *et al*., [15] (3.33%).

Surgery

The surgeries were performed by two surgeons using manual Phaco (96.2%) and ECC (3.8%) techniques, with posterior chamber implantation (97%). This preference for the Phaco technique was due to the surgeons' preference.

This result differs from that of Haidara M [8] (66.7% Phaco, 33.3% ECC), who noted a shortage of Phaco kits, BALLO A [9] (47.1% Phaco, 52.9% ECC), and Rupert [20] in Pakistan (66% Phaco, 34% ECC). It also differs from that of Guirou N *et al*., [18] (52.2% ECC, 47.4% Phaco).

Perioperative and Postoperative Complications

In our study, the most common perioperative complication was vitreous loss, with 3%. This was more often due to patient agitation.

This result is similar to those of Haidara M [8] (3.6%), BALLO A [9] (3.3%), Guzek [23] in Ghana (3%), Daboué [24] (3%), and higher than those of Guirou N *et al*., [18] (1.83%). Early postoperative complications were dominated by corneal edema (7.6%), with favorable evolution. This was more often due to manipulations in the anterior chamber, especially the manual expulsion of the crystalline nucleus in Phaco surgery.

This result is lower than that of Haidara M [8] (9.9%) and Diallo JW *et al*., [15] (26.33%). Posterior capsule opacification was the most common late

postoperative complication (6.1%). These cases were referred to IOTA due to the lack of YAG laser at the Dioïla CSO. Our result is similar to those of Haidara M [8] (6.4%), Ballo A [9] (7.9%), Touré [25] (5%), and Guindo [26] (6.8%).

Functional Outcomes

At the end of our study, the functional outcomes showed that 75.6% of the patients had good visual acuity (VA) without correction, and 8.4% had poor VA. With correction, the proportion of patients with good results increased to 80.2%, and 6.8% had poor results.

These results are below the WHO standards, which recommend a VA of >80% without correction for good outcomes and a VA of >90% with the best correction, with a VA of <5% for poor outcomes. This could be explained by pathologies other than cataract in the operated eye (Bietti's corneal dystrophy, previous iritis, glaucoma).

Our good and poor outcomes without correction are comparable to those of Haidara M [8] (76.6% and 7.8%) and better than those of BALLO A [9] (65% and 11.2%).

Our good and poor outcomes with best correction are similar to those of Haidara M [8] (83.7% and 6.4%), better than those of Guirou N *et al*., [18] (63% and 14%), and lower than those of BALLO A [9] (88.8% and 7.5%).

Causes of Poor Outcomes

The causes of poor functional outcomes were related to associated pathologies (Bietti's dystrophy, previous iritis, glaucoma) with 6.9%. This could be explained by poor case selection during the mass screening campaign.

This result is higher than that of Djiguimdé *et al*., [28] (4.4%), comparable to that of Haidara M [8] (7.8%), but different from Ongoïba [16], who found 36.4% due to refractive errors as the cause of poor functional outcomes.

CONCLUSION

Cataracts, the leading cause of blindness worldwide, remain a major public health challenge, particularly in developing countries, where prevalence increases with age. The evaluation of functional outcomes from free cataract surgery during a mass campaign at the CSRéf of Dioïla has allowed us to assess functional results, identify perioperative and postoperative complications, and determine the causes of poor functional outcomes. At the end of the study, our functional results were below WHO recommendations. These results could be improved by enhancing case selection during mass campaigns to avoid surgery in patients who would not benefit, reducing surgical complications, and ensuring long-term follow-up of results.

ANNEX 1:

Table I: Distribution of Patients by Age Group

Age Group	Number of Patients	%
< 50	7	5.3
50-59	18	13.7
60-69	49	37.4
70-79	48	36.6
80 and above	9	7
Total	**131**	**100**

The age group 60-69 represented 37.4% of the 131 eyes operated.

Table II: Distribution of Patients by Gender

Gender	Number of Patients	%
Male	55	42
Female	76	58
Total	**131**	**100**

Females were more represented with 58%.

Table III: Distribution of Patients by Profession

Profession	Number of Patients	%
Farmer	41	31.3
Herdsman	8	6.1
Housewife	67	51.1
Merchant	3	2.3
Civil servant	3	2.3
Other*	9	6.9
Total	**131**	**100**

Housewives represented the majority of the sample with 51.1%.
*Other: tailor, mason, carpenter, blacksmith.

Table IV: Distribution of Patients by Origin

Origin	Number of Patients	%
Dioila District	109	83.2
Fana District	12	9.2
Kignan District	2	1.5
Barouéli District	3	2.3
Bougouni District	2	1.5
Koutiala District	2	1.5
Other*	1	0.8
Total	**131**	**100**

The majority of patients were from Dioila, with 83.2%.
*Other: Bamako.

2. Preoperative Examination

Table V: Distribution of Patients by Preoperative Visual Acuity

Preoperative Visual Acuity	Number of Patients	%
VBM at CLD 5m	56	42.7
PL+	75	57.3
Total	**131**	**100**

The majority of patients had light perception as their preoperative visual acuity, representing 57.3%.

Table VI: Distribution of Patients by Ocular Pathologies Other Than Cataract in the Operated Eye

Ocular Pathology in Operated Eye	Number of Patients	%
Corneal Scars	1	0.8
Old Uveitis	1	0.8
GPAO	2	1.5
Bietti's Dystrophy	5	3.8
None	122	93.1
Total	**131**	**100**

Bietti's corneal dystrophy was the most common ocular pathology in the operated eye, representing 3.8%.

3. Surgery

Table VII: Distribution by Surgical Technique

Surgical Technique	Number of Patients	%
PHACO A	126	96.2
EEC	5	3.8
Total	**131**	**100**

PHACO A was the most commonly used technique, with 96.2%.

Table VIII: Distribution by Implant Placement

Implant Placement	Number of Patients	%
ICP	127	97
ICA	2	1.5
No Implant	2	1.5
Total	**131**	**100**

Most of the operated eyes were implanted in the posterior chamber, accounting for 97%.

4. Functional Results

Table IX: Distribution of Patients by Uncorrected Visual Acuity at J45 Post-Operative

Uncorrected Visual Acuity	Number of Patients	%	WHO Standards
Good (AVL ≥ 3/10)	99	75.6	> 80%
Borderline (AVL 2/10 ≥ 1/10)	21	16	< 15%
Poor (AVL < 1/10)	11	8.4	< 5%
Total	**131**	**100**	**100%**

Out of 131 operated eyes, 75.6% had good uncorrected visual acuity, and 8.4% had poor uncorrected visual acuity.

Table X: Distribution of Patients by Visual Acuity with Correction at J45 Post-Operative

Visual Acuity with Correction	Number of Patients	%	WHO Standards
Good (AVL ≥ 3/10)	105	80.2	> 90%
Borderline (AVL 2/10 ≥ 1/10)	17	13	< 5%
Poor (AVL < 1/10)	9	6.8	< 5%
Total	**131**	**100**	**100%**

With the best correction, 80.2% had good visual acuity, and 6.8% had poor visual acuity.

5. Per and Post-Operative Complications

Table XI: Distribution of Patients by Per-Operative Complications

Per-Operative Complications	Number of Patients	%
Capsular Rupture Without Vitreous Loss	2	1.5
Capsular Rupture With Vitreous Loss	4	3
Zonular Dehiscence	1	0.8
Iridodialysis	1	0.8
Others*	2	1.5
None	121	92.4
Total	**131**	**100**

Capsular rupture with vitreous loss was the main per-operative complication, at 3%.

Table XII: Distribution of Patients by Early Post-Operative Complications (J1 to J15)

Early Post-Operative Complications	Number of Patients	%
Corneal Edema	10	7.6
Fibrin	2	1.5
Hyphema	3	2.3
Remnants of Crystalline Material	3	2.3
Others*	3	2.3
None	110	84
Total	**131**	**100**

Corneal edema represented 7.6% of early post-operative complications.

Table XIII: Distribution of Patients by Late Post-Operative Complications (J45)

Late Post-Operative Complications	Number of Patients	%
Chronic Corneal Edema	2	1.5
Posterior Capsule Opacification	8	6.1
None	121	92.4
Total	**131**	**100**

Posterior capsule opacification was the most common late post-operative complication at 6.1%.

6. Causes of Poor Functional Outcomes

Table XIV: Distribution of Patients by Causes of Poor Functional Outcomes at J45 post-operative

Causes of Poor Outcomes	Number of Patients	%
Selection	9	6.9
Surgery	2	1.5
Induced Ammetropia	5	3.8
None	115	87.8
Total	**131**	**100**

Selection: Preoperative comorbidities (Bietti's corneal dystrophy, old iritis, corneal scar, glaucoma).
Surgery: Chronic corneal edema.
Induced Ammetropia: Inappropriate implant power.
The cases of selection were the causes of poor functional outcomes, accounting for 6.9%.

ANNEX 2:

• QUESTIONNAIRE FORM

Case number: / /

Name and Surname:

I - SOCIO-DEMOGRAPHIC DATA

1. Age: / / (<50= 1, 51-60=2, 61-70=3, 71-80=4, 81 and above)
2. Gender: / / (Male= 1, Female= 2)

3. Profession: / / (Farmer= 1; Civil servant= 2; Merchant= 3; Housewife= 4; Retired= 5; Self-employed= 6; Child= 7)
4. Residence: / / (Dioila health district= 1; Outside Dioila health district)

II - CLINICAL DATA

5. Preoperative visual acuity: / / (<1/10=1, 1/10 and < 3/10=2, ≥ 3/10=3)
6. Comorbidity: / / (Strabismus= 1, Diabetes= 2, Hypertension= 3, Ocular trauma= 4, None= 5)
7. Corneal appearance: / / (Transparent= 1, Cataract= 2, Leukoma= 3, Dystrophy= 4)
8. Cataract etiology: / / (Congenital= 1, Traumatic= 2, Senile= 3, Pathological= 4)

III - THERAPEUTIC DATA

9. Surgical technique: / / (EEC + IOL= 1, Phaco A + IOL= 2)

10. Operated eye: / / (Right eye= 1, Left eye= 2)

11. Perioperative complications: / / (Iridodialysis= 1, Posterior capsule rupture without vitreous loss= 2, Capsule rupture with vitreous loss= 3, None= 4)

12. Type of IOL: / / (IOL= 1, Acrysof= 2)

IV - ANATOMO-FUNCTIONAL RESULTS

13. Postoperative complications on day 1: / / (Corneal edema= 1, Iris hernia= 2, Hyphema or blood Tyndall effect= 3, Off-centered implant= 4, Residual crystalline mass= 5, Iris pigment= 6, Vitreous in AC= 7, Posterior capsular opacification= 8, Hypopyon= 9, Endophthalmitis= 10, None= 11)

14. Postoperative complications on day 4: / / (Corneal edema= 1, Iris hernia= 2, Hyphema or blood Tyndall effect= 3, Off-centered implant= 4, Residual crystalline mass= 5, Uveitis= 6, Vitreous in AC= 7, Posterior capsular opacification= 8, Iris pigment= 9, Hypopyon= 10, Endophthalmitis= 11, Keratitis= 12, None= 13)

15. Postoperative complications on day 15: / / (Corneal edema= 1, Iris hernia= 2, Hyphema or blood Tyndall effect= 3, Off-centered implant= 4, Residual crystalline mass= 5, Uveitis= 6, Vitreous in AC= 7, Posterior capsular opacification= 8, Iris pigment= 9, Hypopyon= 10, Endophthalmitis= 11, Keratitis= 12, None= 13)

16. Postoperative complications on day 45: / / (Corneal edema= 1, Iris hernia= 2, Hyphema or blood Tyndall effect= 3, Off-centered implant= 4, Residual crystalline mass= 5, Uveitis= 6, Vitreous in AC= 7, Posterior capsular opacification= 8, Iris pigment= 9, Hypopyon= 10, Endophthalmitis= 11, Keratitis= 12, None= 13)

19. Uncorrected visual acuity on day 45: / / (<1/10=1, 1/10 and <3/10=2, ≥3/10=3)
20. Visual acuity with spectacles on day 45: / / (<1/10=1, 1/10 and <3/10=2, ≥3/10=3)
21. Corrected visual acuity on day 45 with the best correction worn: / _/ (<1/10=1, 1/10 and <3/10=2, ≥3/10=3)

REFERENCES

1. Lawani, R., Pommier, S., & Roux, L. (2007). Magnitude and Strategies for Cataract Management Worldwide. *Med Trop*, 67, 644-650.
2. Resnikoff, S., Pascolini, D., Etya'Ale, D., Kocur, I., Pararajasegaram, R., Pokharel, G. P., & Mariotti, S. P. (2004). Global data on visual impairment in the year 2002. *Bulletin of the world health organization*, *82*(11), 844-851.
3. WHO. World Report on Vision. 2019 Geneva, About 3 screens. Available: https://www.who.int/fr/news/item/08-10-2019-who-launches-first-world-report-on-vision
4. Diallo, J. W., Meda, N., & Boni, S. (2015). Complications of Small Incision Cataract Surgery with Posterior Chamber Insertion: About 300 Cases. *SOAO Review*, 1, pp. 21-27.
5. Mensah, A., Balo, K. P., & Kondi, G. (2003). Cataract Surgery in Togo. *Med Santé Tropicale*, *13*(1), pp. 5-8.
6. Nadio, T., Napo, A., & Baldé, R. (2017). Extracapsular Extraction vs Manual Phacoemulsification without Sutures in Adult Cataract Treatment at CHU-IOTA. *Mali Médical*, 3, pp. 16-19.
7. Pouliquen, Y. (1983). *Précis d'ophtalmologie*. Ed Masson, Paris, 637 p.
8. Haidara, M. (2018). Evaluation of Functional Outcomes of Cataract Surgery in Patients Aged 40 and Over at the Fana Health Center (Mali), DES Ophthalmology Thesis 2018.
9. Ballo, A. (2023). Functional Outcomes of Cataract Surgery at the Secondary Ophthalmology Center of Ouelessebougou: About 170 Cases. *Med Thesis* (USTTB) 2023.
10. Windinmanégdé, P., Diomandé Abib, I., & Ahnoux-Zabsonré, A. (2015). Outcomes of Advanced Cataract Surgery with Tunnelization: About 262 Cases. *Pan African Medical Journal*, 22, 366.
11. Maneh, N., Banla, M., & NononSaa, K. B. (2015). Small Incision Manual Cataract Surgery: An Alternative in Sub-Saharan Africa. *RESEARCH-An Academy Journal*, 2, 1307.
12. Harba, T., Djada, D., Didier, K. A., & Yena, A. (2013). Functional Outcomes of Cataract Surgery During the Ophthalmological Caravan at Abéché Regional Hospital in Chad. *TCHAD Scientific Review*, *1*(13).
13. Ammous, I., Bouayed, E., Mabrouk, S., Boukari, M., Erraies, K., & Zhioua, R. (2017). Phacoemulsification vs Manual Small Incision Cataract Surgery: Anatomical and Functional Outcomes. *French Journal of Ophthalmology*, 40, 460-466.
14. Cellule de Planification et de Statistiques (CPS/SSDSPF). *Institut National de la Statistique*

(INSTAT). Centre d'Études et d'Information Statistiques (INFO-STAT). Demographic and Health Survey (EDSM V). May 2014; 577 p.
15. Diallo, J. W., Meda, N., Ahnoux-Zabsonré, A., Yameogo, C., Dolo, M., Sanou, J., Daboué, A. (2015). Functional Outcomes of Cataract Surgery with Phacoalternative and Posterior Chamber Insertion: About 300 Cases in Bobo Dioulasso (Burkina Faso). *Pan Afr Med J*, 20, 230. www.ncbi.nlm.nih.gov/pubmed "13/06/17 at 19:00".
16. Ongoïba, A. (2016). Functional Outcomes of Cataract Surgery at Nara CSRéf. DES Ophthalmology Thesis, CHU-IOTA 2016.
17. Limburg, H. (2004). Evaluation of Cataract Surgery Outcomes, Methods, and Tools. *Community Eye Health*, *1*(1), 14-17.
18. Guirou, N., Napo, A., Dougnon, A., Bakayoko, S., Sidibé, F., & Sidibé, M. K. (2013). Functional Outcomes of Adult Cataract Surgery. *J Fr Ophthalmol*, *36*(1), 19–22.
19. Traoré, M. T. (2010). Functional Outcomes of the Free Cataract Surgery Campaign at IOTA by the Moroccan Medical Solidarity Association in 2009. *Thesis, Med, Bamako* 2010.
20. Bourne, R., Dineen, B., Jadoon, Z., Lee, P. S., Khan, A., Johnson, G. J., ... & Khan, D. (2007). Outcomes of cataract surgery in Pakistan: results from the Pakistan national blindness and visual impairment survey. *British journal of ophthalmology*, *91*(4), 420-426.
21. Méda, N., Daboué, A., Nagallo, Y., Ouédraogo, P.A., Ramdé, B., & Ouoba, K. (2009). Interest of Extracapsular Cataract Extraction with Artificial Lens Implantation. *Burkina Medical*, *13*(02), 65–74.
22. Fanny, A., Keita, C. T., Adjorlolo, A. C., Konan Toure, M. L., Gbe, K., & Coulibaly, F. (2001). Accessibility to Cataract Surgery in Developing Countries: Results of 120 Cataract Cases Operated in 6 Months at CHU Treichville, Abidjan, Ivory Coast. *Med Afr Noire*, *48*(1).
23. Guzek, J. P., & Ching, A. (2003). Small Incision Manual Extracapsular Cataract Surgery in Ghana, West Africa. *J Cataract Refract Surg*, *29*(1), 57–64.
24. Daboué, A., Méda, N. D., Ahnoux-Zabsonré, A., & Diallo, J. W. (2002). Complications of Artificial Lens Implantation in Posterior Chamber. *Med Afr Noire*, *49*(4), 161–165.
25. Toure, O. (2003). Intraocular Implantation in Rural Areas: About 80 Cases in Ouelessebougou, Thesis, CES Ophthalmology, IOTA 2003.
26. Guindo, A. I. (2002). Intraocular Implantation in Rural and Urban Areas: About 204 Cases, Thesis, CES Ophthalmology, IOTA 2002.
27. Gogate, P. M., Deshpande, M., Wormald, R. P., Deshpande, R., & Kulkarni, S. R. (2003). Extracapsular cataract surgery compared with manual small incision cataract surgery in community eye care setting in western India: a randomised controlled trial. *British Journal of Ophthalmology*, *87*(6), 667-672.
28. Djiguimdé, P. W., Diomandé, I. A., Ahnoux-Zabsonré, A., Koffi, K. V., Meda, T. A., Diomandé, G. F., ... & Meda, N. (2015). Résultats de la chirurgie avancée de la cataracte par tunnélisation: à propos de 262 cas réalisés au CHR de Banfora (Burkina Faso). *Pan African Medical Journal*, *22*(1), 366.