

# Barriers to Access to Surgery in Patients over 50 Years of Age, Diagnosed with Cataract and Its Visual Deficit

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## To cite this article:

Juan Raúl Hernández Silva, Jhoana Aguirre Oramas, Carmen María Padilla González, Heidy Hernández Ramos, Meisy Ramos López. Barriers to Access to Surgery in Patients over 50 Years of Age, Diagnosed with Cataract and Its Visual Deficit. *Reports*. Vol. 2, No. 1, 2022, pp. 37-42. doi: 10.11648/j.reports.20220201.16

**Received:** January 31, 2022; **Accepted:** February 18, 2022; **Published:** March 29, 2022

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**Abstract:** Cataract is the main cause of visual impairment in all regions of the world, which increases with population aging, and its control has been unsuccessful to date, as has been shown by blindness surveys carried out to date, where they have been identified among other aspects the barriers that impede the access of patients to surgical treatment. A prospective longitudinal descriptive study was carried out with the aim of analyzing the barriers to access to surgery in patients older than 50 years, with a diagnosis of cataract and their visual deficit. 121 patients (195 eyes) who met the inclusion criteria and received surgical treatment from January to December 2019 at the ICO "Ramón Pando Ferrer" were selected. The variables studied were age, sex and best corrected visual acuity before and after surgery, personal and ocular pathological history, as well as the barriers that delayed or prevented surgery. Female patients between 70 and 79 years of age predominated, and all the variables studied improved after surgery. Concluding that the barriers to access to cataract surgery identified in this study do not differ from those reported by other regional studies, and indicates that health actions must be carried out between the different levels of medical care, to develop satisfactory prevention blindness policies.

**Keywords:** Cataract, Barriers, Prevention of Blindness

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## 1. Introduction

Worldwide, according to the estimates of the World Health Organization (WHO) for 2010, it is estimated that approximately 1.3 billion people live with some form of visual impairment, with respect to distance vision, most of them Over 50 years of age, 188.5 million people have a moderate visual impairment, 217 million have a moderate to severe visual impairment and 39 million are blind (14%), where 80% of all of them are considered preventable and poor populations are more affected by visual disabilities [1-5].

About 90% of the global burden of visual impairment is concentrated in developing countries. 82% of people who suffer from blindness are 50 years or older, 75% are due to preventable or treatable causes and 90% live in developing countries [1-5].

The causes and numbers of the blind population vary by region in the world, in addition to the place of residence of

these patients, whether urban or rural, but in general, 51% of all causes of blindness are due to cataracts, 8% Glaucoma, 5% Age-related Macular Degeneration, 35% Refractive Errors and 15% Retinal Detachment [1-5].

The 65% of visual disabilities are in patients over 50 years of age, which is 20% of the world population and increases with age, which is why blindness and visual impairment are such an important health problem, since 1999 The global initiative for the elimination of preventable blindness promoted by the WHO, known as "Vision 2020: the right to see", emerged, which aims to develop national plans for the prevention of blindness, but still the causes of blindness avoidable or curable are between 38 to 74% and refractive errors represent 11.9% [1-5].

Within the framework of this program, blindness surveys were developed to know the epidemiology of blindness in the different countries where they were applied, either RACSS (Rapid Ascemends of Cataracts Surgical Sevicies) or RAAB

(Rapid Ascemends of Avoible Blidness), despite the implementation of VISION 2020 in Latin America, most cases of blindness and visual impairment continue to be caused by preventable causes, mainly cataracts (blindness, 38-74%) and refractive errors (blindness, 0-11, 9%, visual impairment, 72%). In this regard, we found RACSS or RAAB studies in 12 countries: Argentina, Brazil, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala, Mexico, Paraguay, Peru and Venezuela. These studies report that the prevalence of bilateral blindness in people older than 50 years varied between 1.1% (Argentina), 2% (Brazil), 1.6% (Chile), 1.6% (Colombia), 1.7% (Ecuador), 2.1% (Peru) and 4.2% (Venezuela). The main cause of blindness in all studies was cataract, and the proportion of this ranged from 40.9% (Brazil), 57% (Chile), 68% (Colombia), 74% (Ecuador), 68% (Guatemala), up to 56% (Peru) [4, 6-11].

The Cuban Ministry of Public Health joined this blindness prevention program, the Vision 2020 program, to respond to this health problem, since the population's life expectancy increases in a sustained manner, made up of 11,201,549 inhabitants, and 20.8% of them are 60 years of age and over. Life expectancy at birth for both sexes was 78.45 years of age and it is still on the rise. This increase in life expectancy at birth brings with it an increase in diseases related to the elderly, among which are cataract, this being a causal factor of visual impairment [12].

In Havana in 2005, a population survey (RACSS) was carried out to determine the causes of disability in the population over 50 years of age, which allowed obtaining important data related to the prevalence and coverage of cataract treatment in La Havana after eight years, a national survey (RAAB) was concluded in 2013 and allowed making comparisons with the previous study to evaluate the impact of the visual impairment prevention program, showing that cataract ranks first for both blindness and blindness severe visual impairment [13-15].

Cataract is defined as the opacity of the lens that obstructs the passage of light towards the retina and causes a slow and progressive loss of vision, it can appear at any stage of life, from birth to the most advanced age of the human being. It has different origins; however, in most cases it is related to the normal aging process [16].

All these studies on the prevalence of blindness include a survey on the barriers or causes for which patients have undergone surgery, which include the lack of knowledge by the population that cataract blindness is treatable, remote access from rural areas to ophthalmological centers, the cost / time care that represents the family economy and fear of surgical intervention, all of them must be overcome to achieve successful interventions to eliminate the current visual problem [6-11, 13-15].

Nowadays, campaigns are carried out to identify patients with cataract as a cause of poor vision; the organizational strategies generally have different days to select patients in the ophthalmological center, enhance preoperative studies, biometric studies, etc., and finally a day of surgery [6-11, 13-15].

## 2. Methodology

A prospective longitudinal descriptive study was carried out with the objective of determining the barriers that hinder access to cataract surgery in patients older than 50 years of age.

The universe was made up of patients over 50 years of age, who attended the ocular microsurgery service of the ICO Ramón Pando Ferrer with some degree of visual impairment caused by the cataract.

The Inclusion criteria were age over 50 years, preoperative cataract line corrected visual acuity less than 0.3 in one or both eyes consent to participate in the research. The exclusion criteria were non-Cuban patients, illness or condition that implies a difficulty in communicating with the investigator. The exit criteria were diagnosis of visual impairment due to a cause other than cataract (determined in the postoperative period) and participant in the study leaving the cataract outpatient follow-up.

The study samples were all patients who met the above criteria and received surgical treatment by phacoemulsification in the period from January 2019 to December 2019 were selected for the research. It was made up of 121 patients (195 eyes that met the inclusion criteria, exclusion and departure previously established).

To achieve the objectives of this research, the variables age, sex, personal pathological history (Diabetes Mellitus and Arterial Hypertension), ocular pathological history (Glaucoma and Diabetic Retinopathy), preoperative and postoperative visual acuity best corrected by eyes of studied patients were selected., changes in visual acuity best corrected after cataract surgery for the right and left eyes and barriers to cataract surgery.

All patients underwent an ocular physical examination in the preoperative period and after defining the diagnosis of cataract, it was determined if they met the inclusion criteria for this study. The patients and their families were explained what the surgical technique consisted of, its risks and benefits. The medical examinations included biomicroscopy of the anterior segment, measurement of the BCVA, BCVA and IOP.

The IOL power calculation was performed, by the IOL Master 700 (Zeiss), and the formula was applied according to its measurements, the 3rd generation formulas used were SRK-T for emmetropic and myopic patients, as well as Hoffer Q for hyperopic patients, for the calculation of the IOL due to its high precision since they are based on the effective lens position respect to the plane of the cornea (ELP) to increase its accuracy.

### 2.1. Surgery

The surgical interventions were executed by the same expert surgeon (RM) using topical anesthesia. After the creation of a temporal corneal tunnel incision and a capsulorhexis of about 5.5 mm, the lens phacoemulsification was performed by the pre chop technique using the phaco device Revolution (Optikon), the Ocuflex brand hydrophilic

acrylic foldable intraocular lens, model RYCF, and was implanted. At the end of surgery intracameral cefuroxime was injected in the anterior chamber. The corneal incisions were sealed with stromal hydration.

Each patient followed a topical antibiotic and anti-inflammatory prophylaxis and a postoperative treatment with topical steroid plus antibiotic drops (one drop four times daily for the first four days, then one drop three times daily for the following one month).

The patients were not occluded after surgery, to reduce their degree of anxiety, and well-cleaned dark glasses were placed on them for their transfer home.

## 2.2. Statistical Analysis

With the data obtained in the questionnaires, a database will be developed in the Microsoft Excel program, which will be processed in the statistical package SPSS version 15.0. The results are summarized in tables and graphs, expressed in absolute relative frequencies and average values.

## 2.3. Ethical Considerations

The procedure will be carried out in strict compliance with the bioethical principles in accordance with the provisions of the National Health System and provided for in Law No. 41 on Public Health, having as a fundamental premise the informed consent and information on the procedures to be performed on the patient. The project will be presented to the scientific council and ethics committee of the Cuban Institute of Ophthalmology "Ramón Pando Ferrer", for approval and subsequent systematic evaluation of the research.

## 3. Results

In the group of patients studied there was a predominance of female patients (67 / 55.3%) over males (54 / 44.7%). Within the male group, patients aged 60-69 years predominated, while in the female group those aged 70-79 years. The largest number of patients in both groups was concentrated in those older than 60 years; while the group between 70 and 79 years is the one with the highest number of cases (47 / 38.8%) for both sexes.

In the group of patients studied according to personal pathological antecedents, the antecedent that was most present was diabetes mellitus with 14.05%, followed by arterial hypertension with less frequency in 2.48% and finally other diseases with 2.48%.

The preoperative best corrected visual acuity by eyes of patients studied in the group 0.1 to  $\leq 0.3$  was recorded 56.1% in RE and 64% in LE, with a total of 60.1% for both eyes. In the group from 0.1 to 0.05, 33.7% were registered in RE and 24% in LE, obtaining a total of 28.8% for both eyes. In the last group less than 0.05, 12.2% was registered in OD and 12% in LE, with a total of 11.1%.

The best corrected postoperative visual acuity by eyes of patients studied in the group 0.1 to  $\leq 0.3$  was registered 93.3% in RE and 90.9% in LE, with a total of 92.1% for both

eyes. In the group from 0.1 to 0.05, 2.5% was registered in OD and 3.3% in LE, obtaining a total of 2.9% for both eyes. In the last group less than 0.05, 4.1% was registered in OD and 5.8% in LE, with a total of 0.04%.

No significant difference was found between the means of the best corrected visual gain in right and left eyes, presenting a mean initial visual acuity of 0.24 for the right and 0.27 for the left, improving the same at mean visual acuity of 0.86 and 0.88 respectively.

The results of the average visual gains after cataract surgery, according to the previous ophthalmological history, obtained 0.47 in diabetic retinopathy, followed by glaucoma with 0.40.

Regarding the barriers referred by patients to having previously accessed cataract surgery, the most frequent was ignorance of the disease, referred by 76% of those surveyed, followed by not feeling the need to undergo cataract surgery in 42% and fear of having poor surgical results in 16.5%. A smaller number of respondents reported waiting for better family conditions 6.6%, the lack of a companion in 4.9% and due to working conditions 4.9%. The barriers mentioned least frequently by respondents were the patient living alone or having to deal with a surgical waiting list. No patient reported having a disease that would contraindicate surgery.

## 4. Discussion

Within human rights, the right to health is a social right guaranteed in health policies in Cuba, and these refer to the fact that all people can access health care under equal conditions, that they have the same opportunities of healthy development in equity, and that they enjoy a life free of avoidable visual disabilities or enjoying equitable and optimal conditions of access to high-quality ophthalmological services.

Gender is one of the social determinants of the health of the population, it can condition risk behaviors and patterns of access and control of individual and social resources for health, generating differences and inequalities between men and women, in several Latin American countries, according to blindness prevalence studies (RAACS or RAABS), such as Argentina where 44.9% were men and 55.1% women; Costa Rica 32.8% men and 30% women; Cuba 41.2% men and 58.8% women; El Salvador 40.5% men and 59.5% women; Honduras 40.7% men and 59.3% women; Panama 45.5% men and 54.5% women; Paraguay 46.9% men and 53.1% women, Peru 41.5% men and 58.5% women, Uruguay 42.1% men and 57.9% women, figures similar to those shown by this study.

Policies and interventions in health with gender equity imply considering equitably the health care needs of both genders, and achieving norms to promote gender equality in the exercise of the right to enjoy adequate eye health as occurs in Cuba [4, 7-16, 18-20].

In relation to age, despite being all patients over 50 years of age, as required by the survey on the prevalence of avoidable blindness, because in these age groups the highest

incidence of ocular diseases that cause severe visual impairment are concentrated, such as cataract, it was observed that 40% were more frequent in Argentina (between 50 and 59 years of age); Costa Rica 49% (between 50 to 59 years of age); Cuba 36% (between 50 to 59 years of age); The Savior; Honduras; Panama; Paraguay, Peru 39% (between 50 to 59 years of age), Uruguay [4, 7-16, 18-20].

Government health programs and policies must include disability, which implies considering as disabled a person who has one or more permanent physical, sensory, intellectual deficiencies, which for our studies are focused on the visual impairment generated by the waterfall.

Blindness as a visual disability presents different general prevalence rates which are provided by studies carried out in the population over 50 years of age, hence the rates reported in Latin America include Argentina 0.7%; Brazil 1.6%; Chile 1.4%; Costa Rica%; Cuba 2.2%; El Salvador 2.4%; Guatemala 3.6%; Honduras 1.9%; Mexico 1.5%; Panama 3.0%; Paraguay 1.1%; Peru 2.0%; Dominican Republic 2.7%; Uruguay 0.9%; Venezuela 2.3%, these data allow organizing eye health services in order to reduce it. [4, 7-16, 18-20].

It is important to consider the determinants of health, which are factors or variables that act on health both at the individual level, at that of groups or communities, and at the general or societal level. The key determinants for the population vary according to the country and are: income and social position, social support networks, education, employment and working conditions, physical environments, biological and genetic characteristics, child development, health services, as well as culture and gender; some of which do not apply to the Cuban population due to their general equity in all aspects. In general, all stages of the life cycle of people must be considered, from childhood to adulthood, hence the importance of determining the early influences that can act as risk factors that cause health problems and each stage implies different health needs and problems and requires specific interventions, such as those related to visual impairment caused by cataract in patients over 50 years of age.

The main cause of blindness due to untreated cataract provided by blindness studies varies in different countries, hence in Argentina it is 44%; Costa Rica 52.1%; Costa Rica 66.7%; Cuba 58.6%; El Salvador 68.7%; Honduras 59.2%; Panama 66.4%; Paraguay 43.8%; Peru 58% and Uruguay 48.6%; This visual impairment, when measured by the best pre-operative corrected visual acuity, showed less than 0.05 in the eyes of patients in Argentina in 97.1%; Costa Rica 88.9%; Cuba 69.2%; El Salvador 62.7%; Honduras 59.2%; Panama 66.4%; Paraguay 90%; Peru 66.9% and Uruguay 91.3%, figures similar to those reported in this study [4, 7-16, 18-20].

After surgery, these patients improved their vision and left the blind condition, so that the results of the best corrected visual acuity greater than 0.3 was 82% in Argentina; 48.9% Costa Rica; 82.4% in Cuba; 55.5% El Salvador; 62.5% Honduras; 58% Panama; 77% Paraguay; 60.5% Peru and 70% Uruguay, results similar to those reported in this study [4, 7-16, 18-20].

In Cuba, intervention strategies monitored by the MINSAP are developed that include, in an important way, primary health care, for the control of general diseases that influence visual impairment such as Diabetes Mellitus and Arterial Hypertension, which behaved in a similar way in most of the Latin American countries, to the data provided by this study. Ocular disease surveillance is important to organize interventions to reduce blindness and in the studies analyzed in this research, Argentina (Diabetic Retinopathy 16% and Glaucoma 8%); Costa Rica (Diabetic Retinopathy 6.3% and 6.3% Glaucoma); Cuba (Diabetic Retinopathy 2.3% and 14.9% Glaucoma); El Salvador (Diabetic Retinopathy 5.1% and Glaucoma 5.1); Honduras (21% Glaucoma); Panama (Diabetic Retinopathy 1.5% and Glaucoma 10.2%); Paraguay (Diabetic Retinopathy 6.3% and 15.6% Glaucoma), Peru (Diabetic Retinopathy 0.8% and 15.7% Glaucoma); Uruguay (Diabetic Retinopathy 5.7% and 14.3% Glaucoma) [4, 7-16, 18-20].

To face these health problems, alliances between the different levels of health care are important, which allow not only to diagnose and treat visual impairment, but also allow continuous training of health human resources, specialized academic training, and constantly apply scientific advances based on evidence and generate research in prevention of blindness; as well as international cooperation programs such as the Miracles Mission. One of the aspects investigated in the blindness surveys are the barriers that prevent patients from accessing cataract surgery, since when they know them, health actions are planned that act directly in their control or elimination, according to country of residence:

Argentina - "You do not feel you need treatment", "fear of surgery or a bad result", "you cannot pay for the surgery", "treatment denied by the provider", "you are not aware that treatment is possible", "no there is access to treatment" (due to lack of service or geographical barriers) and "local reasons" (distance from treatment centers). -I did not know they had a cataract 12.2%, fear of surgery or poor results 14.6%, did not feel the need 48%, surgical waiting list 6.1%, pending costs 4.9% [4, 7-16, 18-20].

Cuba - "They do not feel the need for treatment" in 48%, in second place, there is the "fear of surgery" in 14.6% and in third place the patients expressed "not knowing that treatment is possible", in 12.2%. In a lower percentage are individuals who have been delayed in the scheduling of surgery (8.5%), scheduled patients awaiting surgery, this, as a local reason 6.1%, and, finally, patients who due to "costs or pending to resolve assurance" have not resolved their problem by 4.9% [4, 7-16, 18-20].

Costa Rica - "They do not feel the need for treatment" in 48%, in second place, there is the "fear of surgery" in 14.6% and in third place the patients expressed "not knowing that treatment is possible", in 12.2%. In a lower percentage are individuals who have been delayed in the scheduling of surgery (8.5%), scheduled patients awaiting surgery, this, as a local reason 6.1%, and, finally, patients who due to "costs or pending to resolve assurance" have not resolved their problem by 4.9% [4, 7-16, 18-20].

El Salvador -I did not know that he had a cataract, fear of

surgery or bad results, he did not feel the need, they told him that surgery was not necessary until now, lack of company, waiting for better family conditions, working conditions, surgical waiting list [4, 7-16, 18-20].

Honduras - “You do not feel you need treatment”, “fear of surgery or a bad result”, “you cannot pay for the surgery”, “treatment denied by the provider”, “you are not aware that treatment is possible” and “there is no access to treatment” (due to lack of service or geographical barriers) [4, 7-16, 18-20].

Panama -I did not know that he had a cataract, fear of surgery or bad results, he did not feel the need, they told him that surgery was not necessary until now, lack of company, waiting for better family conditions, working conditions, surgical waiting list [4, 7-16, 18-20].

Paraguay -I did not know they had a cataract 16.3%, fear of surgery or poor results 34.9%, did not feel the need 2.3%, they were told that surgery was not necessary until now 9.3%, working conditions 7% could not pay for surgery 30.2% [4, 7-16, 18-20].

Peru - “You do not feel you need treatment”, “fear of surgery or a bad result”, “you cannot pay for the surgery”, “treatment denied by the provider”, “you are not aware that treatment is possible” and “there is no access to treatment”, either due to lack of services or geographical barriers [4, 7-16, 18-20].

Uruguay -I did not know that he had a cataract, fear of surgery or bad results, he did not feel the need, they told him that surgery was not necessary until now, lack of company, waiting for better family conditions, working conditions, surgical waiting list [4, 7-16, 18-20].

In general, it can be observed that the causes of barriers to cataract surgery in Latin America are very similar in all countries, despite the culture, religion, degree of literacy and some related to the language in some specific communities.

For these reasons, regional policies for the elimination of avoidable blindness are important and even more collaboration between the different countries, as demonstrated by the Milagros Mission, which as an international program managed to reduce and control the progression of cataract blindness in the countries where it occurs.

The study of the barriers to cataract surgery is crucial for the prevention of blindness and reversible visual impairment, since they allow the elaboration of plans and strategies for the eradication of preventable blindness. Cuba with a free and universal health system currently shows a progressive and significant increase in cataract surgery in recent years, since 2013 it has managed to maintain the ideal rate proposed by the World Health Organization (WHO), of 3,000 surgeries per million inhabitants (33,000 thousand surgeries per year), however, actions to control the progression of blindness must be constant and creative [3, 18-20].

## 5. Conclusions

Thanks to the combined efforts of the VISION 2020

initiative and governments, it is possible to reduce the prevalence of blindness and visual impairment in the world, despite the increase in population and life expectancy, these advances have also been observed in Latin America and the Caribbean, as well as the barriers to access to cataract surgery identified in this study, which do not differ from those reported by other regional studies, and show that health actions must be carried out between the different levels of medical care, to develop successful blindness prevention policies.

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