


## Prevention of endophthalmitis in cataract surgery: Integrative literature review

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Ana Catarina Mattos Fernandes<sup>1</sup>, Camilla Castilho Maia<sup>2</sup> and Edmundo Frota de Almeida Sobrinho<sup>3</sup>

### ABSTRACT

**INTRODUCTION:** Cataract is a disease that causes congenital or acquired opacity of the lens, which can cause partial or total loss of vision. Approximately 85% of cataracts are classified as senile, being considered the main causes of reduced vision in the world. The surgery for its correction consists of removing the opaque lens and replacing it with an intraocular lens (IOL). The most feared complication is postoperative endophthalmitis, which is an infectious condition caused by microorganisms introduced inside the eye during or after the surgical procedure. **MATERIAL AND METHODS:** This is a descriptive study of the Integrative Literature Review (RIL) type on the prevention and control of endophthalmitis after cataract surgeries. **RESULTS:** In this integrative literature review, 11 (eleven) articles that met the previously established inclusion criteria were analyzed. Most studies address the efficacy and recommendation of intracameral antibiotic use as the main prevention strategy for endophthalmitis in the postoperative period of cataracts.

**Keywords:** Endophthalmitis, Cataract surgery.

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<sup>1</sup> Ophthalmologist at the Bettina Ferro de Souza University Hospital

Institution: Federal University of Pará (UFPA)

E-mail: ana\_catarina\_mf@hotmail.com

<sup>2</sup> Master's degree in Amazon Health from the Federal University of Pará

Institution: Federal University of Pará

E-mail: milla\_maia@hotmail.com

<sup>3</sup> Doctor in Ophthalmology from the Federal University of Minas Gerais (UFMG) and Postdoctoral Fellow at the Université de Paris.

Institution: Federal University of Pará

E-mail: edmundofalmeida@gmail.com



## INTRODUCTION

Cataract is a disease that causes congenital or acquired opacity of the lens, which can cause partial or total loss of vision, in addition to blurring vision, reducing night visual quality and causing photophobia. Approximately 85% of cataracts are classified as senile, with a higher incidence in the population over 50 years of age (ALMANÇA, JARDIM, DUARTE, 2018).

Age-related cataracts are one of the leading causes of reduced vision in the world. Diagnosis is based on slit-lamp examination after pupillary dilation. Surgery for its correction consists of removing the opaque lens and replacing it with an intraocular lens (IOL) (GOWER, et al 2017; DELBARRE, FROUSSART-MAILLE, 2020).

Although this surgery is generally considered a safe procedure, showing a favorable visual outcome, surgical complications can occur. The most feared complication is postoperative endophthalmitis, which is an infectious condition caused by microorganisms introduced into the interior of the eye during or after the surgical procedure (KESSEL, et al. 2015).

Based on the route of transmission of infection, endophthalmitis can be classified as exogenous or endogenous. This exogenous condition occurs when infecting organisms enter the eye through direct inoculation, such as intraocular surgery, penetrating trauma, or contiguous spread from adjacent tissues. Endogenous endophthalmitis, on the other hand, occurs when infectious agents are disseminated hematogenously in the eye from a distant focus of infection (SHEU, SJ. 2017).

Postoperative contamination is the most common type of exogenous endophthalmitis, represented mainly by cataract surgery, as it is the most performed intraocular surgery in the world. A variety of pathogens, including bacteria, viruses, fungi, or parasites, can cause the infection and the etiologic agents differ somewhat by the mechanism of infection (KEYNAN, FINKELMAN, LAGACE-WIENS, 2012).

Preoperative measures can be taken to reduce the risk of endophthalmitis. Anesthetic evaluation and control of comorbidities such as diabetes mellitus and hypertension are important, as these patients may have reduced systemic immunity, making them prone to infections. It is recommended to avoid contact or tear duct procedures before, instill Povidone Iodine 5% in the conjunctival sac and periocular skin for three minutes before surgery, use sterile gloves as well as autoclaved or sterile instruments for each case. Maximize the use of surgical drapes and disposable materials. Document the lot number of irrigation fluids and all drugs and memory foam used intraocularly from surgery (VERMA, et al. 2022).

A randomized control study in Europe demonstrated the benefit of intracameral cefuroxime (1mg in 0.1 mL) with a fivefold reduction in the incidence of endophthalmitis after cataract surgery. A multicenter study in India reported a three- to six-fold reduction in acute endophthalmitis after cataract surgery with the use of intracameral moxifloxacin (0.5 mg in 0.1 mL). In a comparative



study between the two intracameral antibiotics, we showed a 3.6-fold reduction in the incidence of acute post-cataract endophthalmitis; there was no statistically significant difference between cefuroxime and intracameral moxifloxacin in the rate of decrease in infection (DAVE, et al, 2021).

Global rates vary between 0.021% and 0.32%<sup>1</sup> and it is estimated that, annually, the total number of cataract surgeries performed worldwide is above 30 million. With this number in mind and assuming one case of endophthalmitis in a thousand surgeries, 30,000 cases occur annually (GUTIÉRREZ, et al. 2022).

Risk factors for exogenous endophthalmitis include intrinsic host conditions and factors associated with the procedure. Some examples are: they are male, advanced age, immunocompromised and recent history of periocular infections (e.g., blepharitis, conjunctivitis). The main intraoperative risk factor is increased intraocular exposure to the patient's adnexal flora and ocular surface, which increases with surgical complexity and complications such as capsule rupture and vitreous loss (KIM, CHEN, COLEMAN, 2017).

Although the use of intracameral antibiotics after surgery is a widely recommended concept around the world for the prevention of endophthalmitis, there are some limitations involving this type of prophylaxis, such as: low bioavailability in deep ocular tissues, prolongation of surgical time, risk of intracameral antibiotics, reflux of pathogens or contamination in the anterior chamber in surgery with incisions that are not completely sealed (LI, et al. 2022).

Recently, three Brazilian studies demonstrated the safety and efficacy of intracameral moxifloxacin. However, the adoption of such scientifically proven strategies in clinical practice is hampered by other factors. Perhaps the biggest obstacle is the lack of commercially available intracameral antibiotics in various parts of the world, including Brazil. Despite high-quality, evidence-based research to support them, several treatment strategies are still considered '*off-label*' (MELEGA, ALVES, LIRA, 2022).

Postoperative endophthalmitis usually presents within one to two weeks after surgery, in the acute type, and within a few weeks or months after surgery, in the chronic type. (KEYNAN, FINKELMAN, LAGACE-WIENS, 2012).

The most common symptom of endophthalmitis is decreased visual acuity, affecting almost all patients. Eye pain or discomfort and conjunctival hyperemia are also common. Hypopyon, which represents a layer of white blood cells in the anterior chamber, is observed in 80% of cases, as is vitreous cloudiness, which is quite common. Systemic symptoms such as fever are more common in endogenous etiology (DURAND, M. 2017).

In case of early diagnosis of endophthalmitis, the impairment of the ocular structure can be avoided to preserve good vision. Therefore, early diagnosis and appropriate treatment are extremely important (SHAERI, M. et al, 2023).



Endophthalmitis is classified as a Health Care-Associated Infection (HAI), which are the most frequent adverse events within a health service. They are a serious public health problem, leading to serious consequences for individual and collective health, as it results in high morbidity and mortality, increased hospitalization time and treatment costs. Although it rarely results in death, the consequences for the quality of life of the affected patient are generally catastrophic, since their prognosis, in most cases, is poor, resulting in loss or reduction of visual acuity and, in some more traumatic cases, loss of the eye (ANVISA, 2017).

Evidence-based conducts aimed at prevention, early diagnosis and appropriate treatments are of great importance to reduce the morbidity of these patients.

In view of this, the following guiding question arises for the research: what are the main prophylactic measures capable of reducing the rates of endophthalmitis after cataract surgery?

## **MATERIAL AND METHODS**

This is a descriptive study of the Integrative Literature Review (RIL) type on the prevention and control of endophthalmitis after cataract surgeries. RIL is a method that provides the synthesis of knowledge and the incorporation of the applicability of results of significant studies into practice. It is composed of six phases that direct its realization, which are: elaboration of the guiding question; search or sample of literature; data collection; critical analysis of the studies; discussion of the results and finally presentation of the integrative review (SOUZA, M; SILVA, M; CARVALHO, R. 2010).

### **IDENTIFICATION OF THE THEME AND ELABORATION OF THE GUIDING QUESTION**

The first step of RIL is to identify the problem that the review will address. The subject must be defined in a clear and objective way, allowing the complete analysis to be directed, with conclusions that are easy to identify and apply. The well-defined starting question will facilitate the definition of descriptors and the execution of the search for studies (SOUZA, et al, 2017). In this way, the researcher identified in her academic trajectory the relevance of the discussion on postoperative complications of cataract surgery, focusing on endophthalmitis, which is considered a rare intraocular infection, but which can generate great morbidity and irreversible visual sequelae.

During this first stage, after choosing the theme, the following guiding question was elaborated: "What are the main prophylactic measures capable of reducing the rates of endophthalmitis after cataract surgery?"

The PICO strategy was used, which is a conceptual model of information retrieval, focusing on evidence in health, which is more widespread and used. This strategy enables the finding of qualitative studies, which refer to experiences lived by the subject and the social phenomena that



involve them through an acronym, (P) population, patient or problem; (I) phenomenon of interest; (C) comparison or control; (O) expected result (ARAÚJO, 2020; ERIKSEN; FRANDSEN, 2018).

Therefore, in the study in question, the acronym (P) represented the population submitted to cataract surgery, the phenomenon of interest (I) was endophthalmitis, while the expected result (O) would be the measures to prevent and control this condition. The comparison or control (C) was not applied in the current study format.

## ESTABLISHMENT OF CRITERIA FOR INCLUSION AND EXCLUSION OF STUDIES/SAMPLING OR LITERATURE SEARCH

To guide the inclusion criteria in the study, the selection of a consolidated database that is widely used in health research is necessary. Therefore, for the selection of articles, the *Medical Literature Analysis and Retrieval System Online* (MEDLINE) was eligible, through the PubMed open access search system.

The inclusion criteria defined for the selection of literature will be original articles, *guidelines*, manuals and protocols published in full that address the theme related to the definition of endophthalmitis, its epidemiology, risk factors and prevention; articles that address strategies and mechanisms of diagnosis, management and, finally, articles that discuss the options for prevention and control of complications caused by endophthalmitis. Only articles, manuals, protocols, or *guidelines* published and indexed on the Medline platform in the last 10 years, in full, in Portuguese or English, will be included in the search. Articles that do not meet the inclusion criteria mentioned will be excluded, in addition to studies whose method corresponds to case reports, experience reports, and those that presented duplicity.

Using the MeSH (*Medical Subject Headings*) tool, which is the vocabulary controlled by the *National Library of Medicine* (NLM) and used to index articles for PubMed, the descriptors were selected through the link <https://www.ncbi.nlm.nih.gov/mesh>.

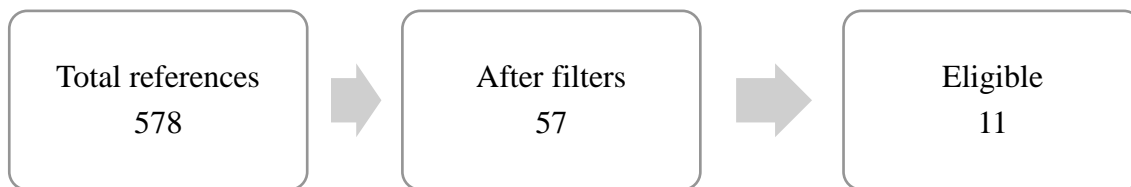
Using English for the search, the following descriptors were selected: "*endophthalmitis*", "*cataract extraction*", "*phacoemulsification*", "*prevention and control*", which in Portuguese are translated, respectively: endophthalmitis, cataract extraction, phacoemulsification, prevention and control.

The Boolean operators (delimiters), represented by the linking terms AND (additive combination), OR (restrictive combination), NOT (excluding combination) are used with the descriptors. Boolean operators have the function of informing the search system of certain combinations of search terms. In this way, the AND, OR and NOT operators, typed in capital letters between the search terms, can be used in order to meet the research objectives (SOUZA, et al, 2017).

Thus, through the <https://pubmed.ncbi.nlm.nih.gov/> link to PubMed, the following search was performed using the combination of the following descriptors and Boolean operators: ((endophthalmitis) AND (cataract extraction OR phacoemulsification)) AND (prevention and control).

A total of 578 references were found in the database after applying the combination described above, between the years 1975 and 2024. After applying the filters: freely available full text and articles from the last 10 years, the result was reduced to 57. The selection of articles was carried out in two phases: 1) reading of the titles and abstracts 2) reading of the study in full, after downloading the studies, to select the study sample.

Complying with the inclusion criteria, 11 articles were selected that answered the guiding question of the research, which were carefully analyzed.



Source: authorship, 2024.

## DEFINITION OF THE INFORMATION TO BE EXTRACTED FROM THE SELECTED STUDIES/ CATEGORIZATION OF THE STUDIES

The first phase of data extraction involves the determination of a general classification system to manage data from diverse methodologies (WHITTEMORE R, KNAFL K., 2005). Therefore, in addition to extracting information about the year of publication, authors involved, and synthesis of the topic addressed, it is also important to classify the methodological design, in order to highlight the level of evidence of each study. The levels of evidence were analyzed based on the Hierarchy of Evidence for Intervention Studies, which classifies studies as: Level I – Systematic review of meta-analyses; Level II – Randomized controlled trials; Level III – Controlled trials without randomization; Level IV – Case-control or cohort study; Level V – Systematic review of qualitative or descriptive studies; Level VI – Qualitative or descriptive study; Level VII – Expert opinion or consensus (SÁ, JS. 2023). This key data has been incorporated into a table and makes up an important part of the results.



## INTERPRETATION OF RESULTS

This phase corresponds to the discussion of the main results in conventional research. The reviewer compares the results of the critical evaluation of the included studies with the theoretical knowledge, highlighting the conclusions and implications resulting from the integrative review (SOUSA et al, 2017).

## PRESENTATION OF THE REVIEW / SYNTHESIS OF KNOWLEDGE

The presentation of the review should be clear and complete to allow the reader to critically evaluate the results. It must contain, then, pertinent and detailed information, based on contextualized methodologies (SOUZA, M; SILVA, M; CARVALHO, R. 2010).

Combining the most relevant information from impact studies, it is possible to analyze patterns and follow recommendations, or verify the need for more research on the subject.

## ETHICAL ASPECTS

The present study was carried out through research in bibliographic sources, with data collection in sources available in free access, online and free. Therefore, the use of data collection or procedures directly performed on human beings was dispensed with, and it was not necessary to submit to the Research Ethics Committee (REC) or sign consent forms for the use of data, free and informed consent forms or similar.

At all stages, ethical principles were maintained, respecting the researchers' copyrights and following the precepts of Law number 9.610/98.

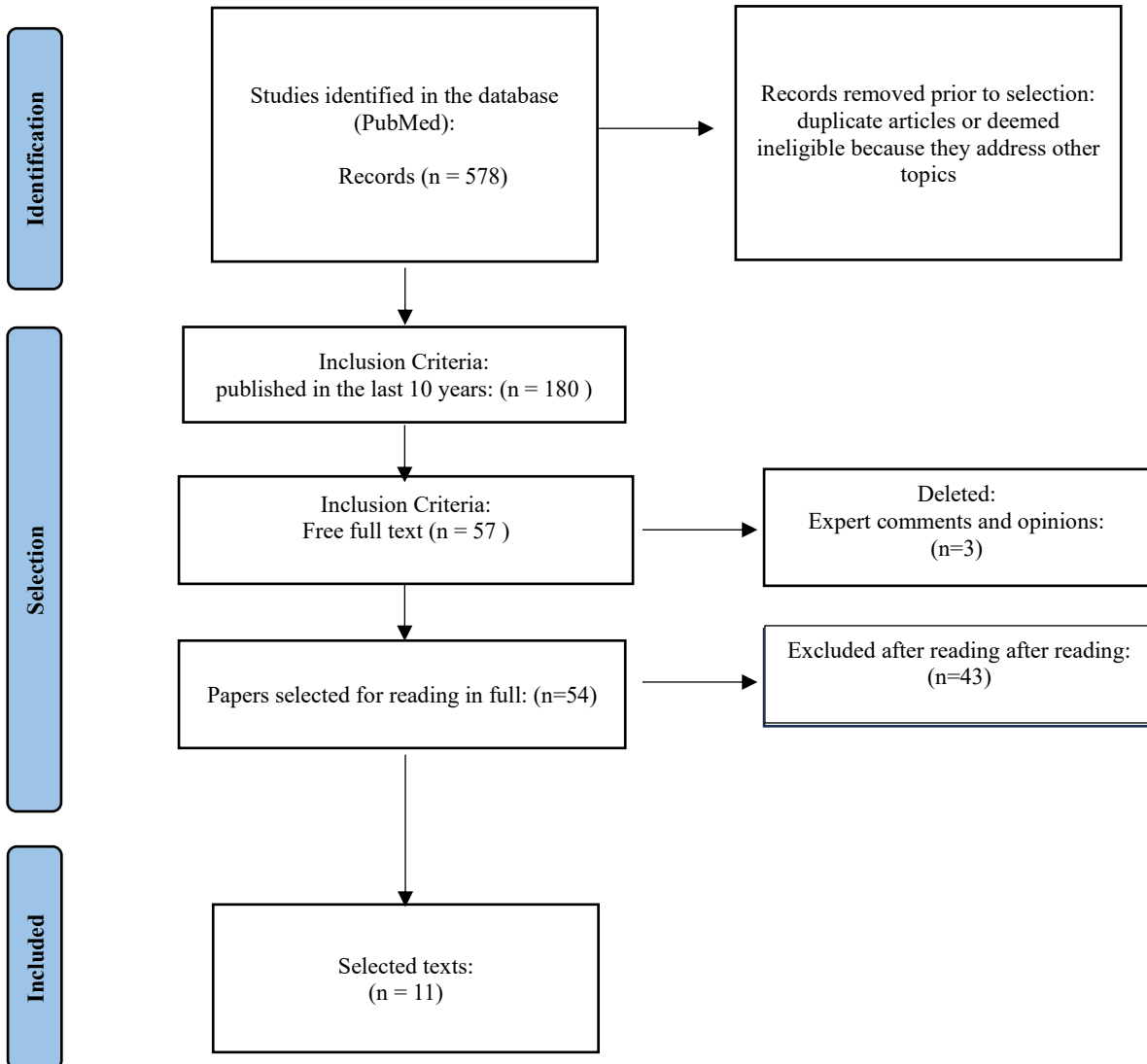
The risks were minimized due to the lack of direct participation of human beings. There was only the risk of losing the database prepared in a *Microsoft Word* ® file, which was reduced through secondary archiving in the form of a *USB stick* and electronic in the cloud with restricted access to the researcher.

## RESULTS AND DISCUSSION

The search in the database was carried out using search filters, based on the inclusion and exclusion criteria, in addition to the full reading of the titles, abstracts and full texts of the selected articles.

Figure 1 shows the flowchart for selecting and selecting articles based on the PRISMA Flow Diagram 2020.

Figure 1: Flowchart for selecting articles.



Source: Authorship (2024).

Chart 1 below presents the articles selected to provide relevant information and characteristics of each publication, including title, authors, year of publication, methodology, and main considerations.



Chart 1: Characteristics of the selected studies.

	Title	Authors/ year of publication	Methodology	Scope/Key Considerations
Art.1	The impact of intracameral cefuroxime antibiotic prophylaxis on postoperative infectious endophthalmitis rates in a high-volume cataract surgical center.	L.N.S, CASAVCHIA. et al, 2023.	Retrospective cohort	It compares the rates of postoperative infectious endophthalmitis before and after the introduction of intracameral antibiotic prophylaxis with cefuroxime in a high-volume service in São Paulo, Brazil.
Art.2	Comparison of different prophylactic measures of endophthalmitis in cataract surgery – A case analysis.	J.K. REDDY, et al. 2022.	Retrospective cohort	This retrospective study comparing the different endophthalmitis protocols and showing the efficacy of amikacin added to BSS with a significant reduction in the overall rate of endophthalmitis.
Art.3	Prophylactic antibiotics for endophthalmitis after cataract surgery: a systematic review and network meta-analysis of 6.8 million eyes.	A KATO, et al. 2022.	Systematic review and meta-analysis	The study collected data from 51 original articles, including two randomized controlled trials, and concluded that intracameral injection of vancomycin, cefazolin, cefuroxime, or moxifloxacin prevented endophthalmitis in the postoperative period of cataracts.
Art.4	All Eye Society of India (AIOS) Task Force guidelines to prevent intraocular infections and cluster flare-ups after cataract surgery.	L. VERMA, et al. 2022	Guideline carried out as a basis for a review article	Based on scientific principles and evidence from the literature, the Indian Society of Ophthalmology has proposed several guidelines that can help prevent infectious endophthalmitis, including guidelines and checklists for use by eye surgeons that can be applied in their practices before starting surgery.
Art.5	Clinical features and microbiology of endophthalmitis after cataract surgery with and without intracameral moxifloxacin prophylaxis: endophthalmitis prophylaxis study report.	V.P. DAVE, et al. 2022	Retrospective case series	It compared and analyzed the record of cataract surgeries from 2015 to 2020 and analyzed the cases that developed endophthalmitis. Concluding that patients with endophthalmitis who received prophylaxis with intracameral moxifloxacin had milder signs and symptoms and responded better to treatment.
Art.6	Bacterial contamination of the ocular surface and its management in the prophylaxis of endophthalmitis after cataract surgery	D.S. SIMINA, et al. 2021.	Literature review	It addresses the relationship between bacterial conjunctival contamination and the impact of its treatment before cataract surgery to prevent endophthalmitis. It concluded that the associated use of povidone-iodine and topical 0.5% levofloxacin is more effective in reducing the conjunctival bacterial load.
Art.7	Endophthalmitis Prophylaxis Study, Report 2: Intracameral Antibiotic Prophylaxis With or	V.M. RATHI, et al. 2020.	Prospective, comparative, interventional,	The study compared the postoperative topical antibiotic use of patients undergoing

	Without Postoperative Topical Antibiotic in Cataract Surgery.		non-randomized study	cataract surgery and concluded that they were unable to change the postoperative outcome of infection in patients undergoing cataract surgery in rural India.
Art.8	Study of endophthalmitis prophylaxis. Report 1: Intracameral Prophylaxis With Cefuroxime and Moxifloxacin for the Prevention of Post-Cataract Endophthalmitis in Rural India	V.M. RATHI, et al. 2020.	Prospective, comparative, interventional, non-randomized study	It showed a 3.6-fold reduction in the incidence of endophthalmitis with the use of intracameral antibiotics (cefuroxime and moxifloxacin) and concluded that there was no statistical difference between the two in reducing infection.
Art.9	Intracameral moxifloxacin after cataract surgery: a prospective study.	N.P. LUCENA, et al. 2018	Prospective case series	With a sample of 1,016 cataract surgeries. It concluded that moxifloxacin is a safe option for intracameral use after cataract surgery.
Art.10	Comparative Analysis of the Safety and Efficacy of Cefuroxime, Moxifloxacin, and Intracameral Vancomycin at the End of Cataract Surgery: A Meta-Analysis	R.C. BOWEN, 2018.	Systematic review and meta-analysis	Compares the efficacy and safety of intracameral injection of cefuroxime, vancomycin, and moxifloxacin in the prevention of endophthalmitis.
Art.11	Perioperative antibiotics to prevent acute endophthalmitis after ophthalmic surgery: a systematic review and meta-analysis	J.HUANG, 2016.	Systematic review and meta-analysis	It was concluded that intracameral antibiotics are effective in preventing endophthalmitis in eye surgery. Intracameral antibiotics are superior to subconjunctival injections.

Source: Authorship (2024).

In this integrative literature review, 11 (eleven) articles were analyzed that met the previously established inclusion criteria and served as a theoretical basis for the construction of a general panorama presented in a descriptive way.

Of the eleven articles selected, nine have in their main or secondary theme the use of intracameral antibiotics in the perioperative period of cataract surgery as an effective method for the prevention of endophthalmitis, emphasizing that these studies guide the most current recommendations present in the literature on the subject.

Article 1 is a retrospective cohort study that was conducted in Brazil, specifically in the city of São Paulo between January 2011 and December 2019. During this period, 23,184 cataract surgeries were analyzed and divided into 2 groups. All 16,977 surgeries performed from 2013 onwards received a prophylactic dose of cefuroxime solution at a concentration of 1mg/0.1 ml during surgery and 2 more drops of moxifloxacin eye drops after the end of the procedure. While the control group received only the dose of topical antibiotic. During the entire study period, there were 9 reported cases of endophthalmitis (0.0388%), 6 of which belonged to the control group. Surgeries performed with antibiotic prophylaxis showed 80% less chance of reported endophthalmitis (OR = 0.20; 95% CI 0.05–0.72; p = 0.014) and 92% less chance of culture-confirmed endophthalmitis (OR

= 0.08; 95% CI 0.01–0.49,  $p = 0.006$ ) than surgeries performed without antibiotic prophylaxis. Therefore, this study recommends the use of intracameral antibiotic prophylaxis due to its low cost in relation to the treatment of endophthalmitis already installed.

Perhaps the biggest obstacle to the widespread use of this prophylaxis is the lack of commercially available intracameral antibiotics in various parts of the world, including Brazil (MELEGA, ALVES, LIRA, 2022). To carry out the Art.1 survey, it was necessary to prepare the cefuroxime solution by diluting the Cefuroxime powder 750 mg available in balanced saline solution (BSS) to reach the desirable concentration for the study. The need to manipulate the drug is one of the obstacles pointed out by experts for its wide use.

Article 2 makes a comparison between the different methods of endoflomite prophylaxis adopted in cataract surgery between the years 2013 and 2021 of an eye hospital in India, which performed 246,874 surgical procedures in this period. These patients were separated into three groups, with Group A consisting of patients who underwent surgery between 2013 and 2015 and received tobramycin 0.1 mL was used in 500 mL of balanced saline solution (BSS) of irrigation solution. Group B, from 2015 to 2017, received 0.5% canned moxifloxacin injected intracameral at the end of all cataract surgeries and Group C, patients who had surgery from January 2017 onwards, 0.1 mL of amikacin (12.5%) was added to each 500 mL of BSS bottle used intraoperatively. Forty-two cases of postoperative endophthalmitis were reported during the study period (0.02%). There was no significant difference in endofalmitis rates between groups A and B.

Art 3 is a systematic review and the first network meta-analysis to comprehensively evaluate the efficacy of antibiotics administered for the prevention of endophthalmitis after cataract surgeries and had a sample of 6.8 million eyes collated through studies published in several countries around the world, including Brazilian studies. Network meta-analysis is an analytical method developed as an extension of peer meta-analysis and is useful when multiple interventions are present in a single subject. Network meta-analysis allows us to estimate the relative effects of all interventions by comparing direct and indirect evidence (S, DIAS, and DM, CALDWELL, 2019).

Multiple analyses have confirmed the advantages of single-agent intracameral administration. Cumulative evidence suggests that intracameral injection of cefuroxime and moxifloxacin decreased endophthalmitis. Vancomycin and cefazolin injected into the anterior chamber may be an even better option due to their antimicrobial spectrum. The study concludes that intracameral injection of vancomycin, cefazolin, cefuroxime, or moxifloxacin had an impact on reducing rates of endophthalmitis after catatate surgery.

Article 4 is a guideline developed by the Indian Society of Ophthalmology in order to prevent outbreaks of endophthalmitis in cataract surgery task forces based on scientific evidence and the country's context.



The text is divided into sessions, ranging from preoperative measures and conducts such as the identification and treatment of periocular infections and the recommendation of periocular instillation of povidone iodine 5%, measures that are already well established and widely used, in addition to guidelines and checklists with recommendations for surgeons and health professionals, which also cover the intraoperative and postoperative periods.

Article 6 does is a literature review on bacterial conjunctival contamination and the impact of its treatment before cataract surgery to prevent postoperative endophthalmitis. It concluded that the associated use of povidone-iodine 5% and topical levofloxacin is more effective in reducing the conjunctival bacterial load, which is the main source of contamination in intraocular surgeries. However, the study reinforces that the use of topical antibiotics on a large scale can generate bacterial resistance.

Article 7 compared the use of topical antibiotics in the postoperative period of patients undergoing cataract surgery who received intracameral antibiotics during surgery. The study concluded that there was no statistically significant difference between the groups of patients who underwent cataract surgery in rural India and that recommending eye drops after surgery could reduce costs in underdeveloped countries. However, the data were obtained in a non-randomized study, which reinforces the need for further analysis on the subject.

Article 5 is a retrospective analysis that compares the clinical, microbiology and results of surgical management after cataract surgery, with and without intracameral moxifloxacin prophylaxis. The study suggests that intracameral antibiotic use should be included as part of the standard operating protocol for cataract surgery. Article 8 also addresses the same time, and demonstrated a 3.6-fold reduction in the incidence of endophthalmitis with the use of intracameral antibiotics through a prospective study. There was no statistically significant difference between the use of moxifloxacin and cefuroxime in this study.

Art. 9 is a prospective study composed of a consecutive sample of 1,016 cataract surgeries in a private hospital in the city of Recife, Pernambuco State, Brazil, between 2015 and 2017. Its aim was to analyze the efficacy and safety of administering 150 µg/0.03 mL moxifloxacin through the surgical incision after the end of surgery, since the only intracameral antibiotic medication is not approved in most countries, including Brazil. There were no records of cases of endophthalmitis and the variables analyzed after surgery, such as corrected visual acuity, corneal endothelial cell density and intraocular pressure, did not present changes outside the usual patterns, in addition to the fact that adverse events were also not reported, demonstrating the safety of the use of this medication in the sample analyzed. The study reinforces that there is a limitation in its results due to the small sample analyzed and the need for a randomized clinical trial.



Article 10 is a systematic review and meta-analysis conducted to compare the efficacy of intracameral cefuroxime, moxifloxacin, and vancomycin in the prevention of endoflotting surgery. We included 17 studies with more than 900,000 eyes around the world that concluded reduced rates of endophthalmitis compared to controls, and that toxicity is minimal or nonexistent at standard doses, strongly recommending the use of this prophylaxis.

Article 11 is also a systematic review and meta-analysis of randomized controlled trials and observational studies, including 34 studies out of twenty-four reports involving 1264797 eyes.

It concluded that intracameral antibiotics are effective in preventing endophthalmitis in eye surgery and are superior to the use of subconjunctival antibiotics.

## **FINAL CONSIDERATIONS**

Scientific production on the improvement of cataract surgery has been increasing in recent years, and topics such as prevention of complications from this surgical act are highlighted. Endophthalmitis is the most feared complication among surgeons around the world due to its great ability to evolve with severe and permanent sequelae.

Most studies that have the prevention of this condition as their main theme address the efficacy and recommendation of the use of intracameral antibiotics as the main prevention strategy for endophthalmitis in the postoperative period of cataracts. Because it is a rare event with catastrophic consequences, prospective studies are more difficult to perform, however, strong evidence such as those demonstrated in this Integrative Literature Review reinforces the need for tools that can contribute to the broad updating of this prophylaxis.



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