Intracameral Antibiotics for Endophthalmitis Prophylaxis in Cataract Surgery: A Meta-Analysis

Mariam Issa MD(C)[1] , Fahmeeda Murtaza MD(C)[1], Marko M. Popovic MD MPH(C)[2], Amandeep Rai MD[2], Matthew B. Schlenker MD MSc[2], Sherif El-Defrawy PhD, MD[2,3]

[1]Faculty of Medicine, University of Toronto, Toronto, Canada; [2]Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, Canada; [3] Kensington Eye Institute, Toronto, Canada.

Introduction

Postoperative endophthalmitis (POE) following cataract surgery is a rare but vision-threatening complication. Despite numerous studies, there is no consensus on the use of IC antibiotics for POE prophylaxis. In this study, we aimed to comprehensively synthesize all available evidence on the efficacy of IC antibiotics for POE prophylaxis in cataract surgery.

Methods

MEDLINE, Embase and Cochrane Library were systematically searched (inception-April 2021) to identify studies on the risk of POE following cataract surgery in eyes that were treated with and without prophylactic IC antibiotics.

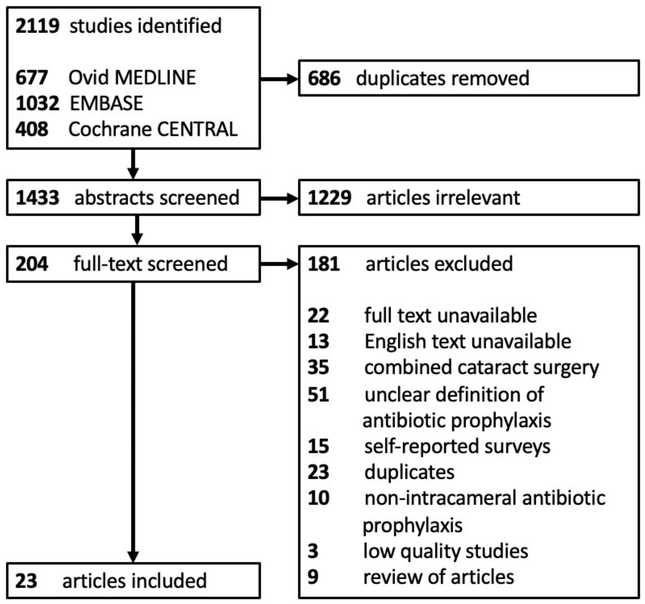

Figure 1: PRISMA flowchart summarizing the process for identifying eligible studies.

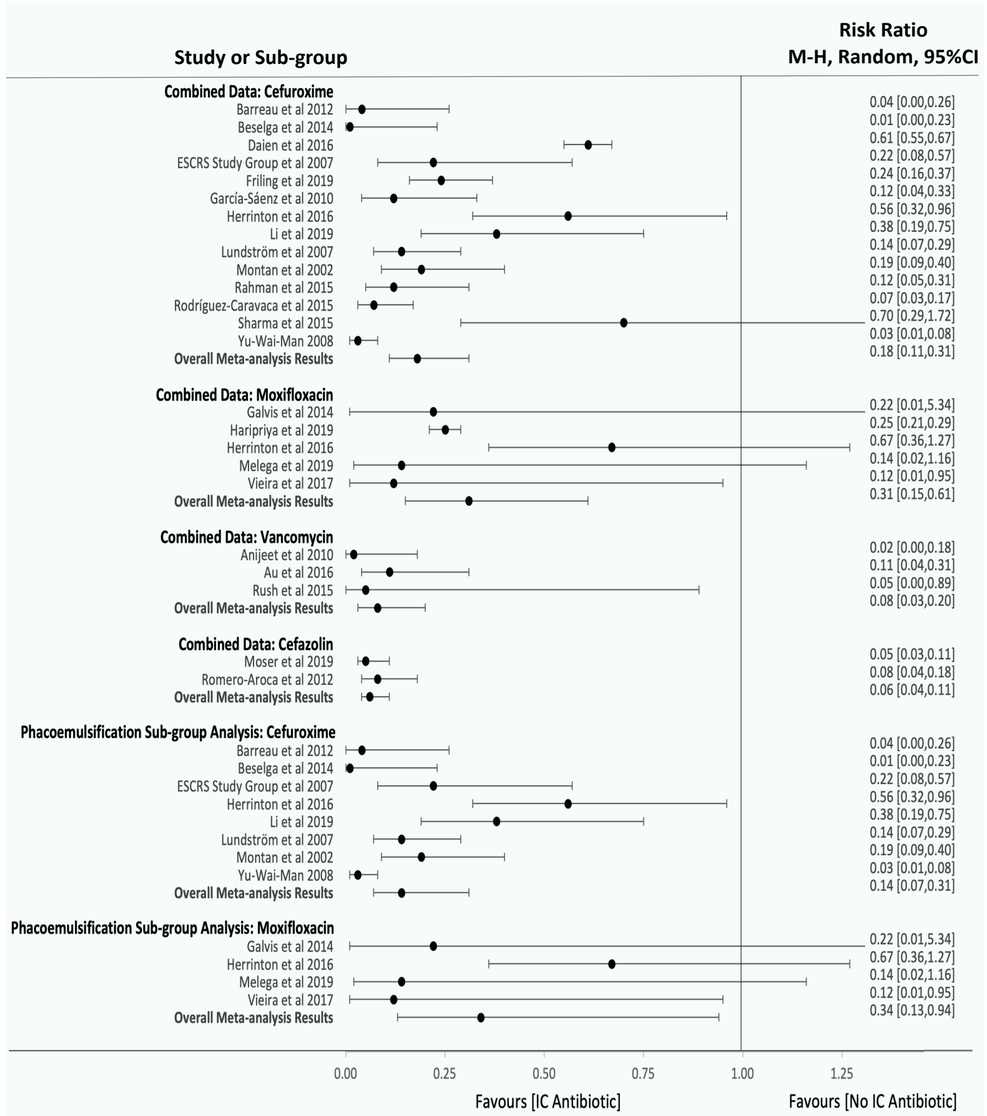

Figure 2: RRs and 95% confidence intervals (CI) were used to compare the POE incidence in eyes treated with and without IC antibiotics. Similar analysis was preformed for eyes treated with and without IC antibiotics during phacoemulsification cataract surgery.

Table 2: Summary of findings table; Intracameral (IC) Antibiotics Compared to Control for Endophthalmitis Prophylaxis Following Cataract Surgery

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)
	Risk with Control	Risk with IC antibiotics			
Risk of POE in the overall IC cefuroxime group	10 per 10,000	2 per 10,000 (1 to 3)	RR 0.18 (0.11 to 0.31)	3212269 (13 observational studies, 1 RCT)	⊕◯◯◯ VERY LOW
Risk of POE in the overall IC moxifloxacin group	7 per 10,000	2 per 10,000 (1 to 4)	RR 0.31 (0.15 to 0.61)	2336083 (4 observational studies, 1 RCT)	⊕⊕◯◯ LOW
Risk of POE in the IC vancomycin subgroup	20 per 10,000	2 per 10,000 (1 to 4)	RR 0.08 (0.03 to 0.20)	52172 (3 observational studies)	⊕⊕◯◯ LOW
Risk of POE in the IC cefazolin subgroup	57 per 10,000	3 per 10,000 (2 to 6)	RR 0.06 (0.04 to 0.11)	81104 (2 observational studies)	⊕⊕◯◯ LOW
Sensitivity analysis: Risk of POE with the data from developing countries excluded	11 per 10,000	1 per 10,000 (1 to 2)	RR 0.13 (0.08 to 0.21)	3364921 (9 observational studies, 2 RCTs)	⊕◯◯◯ VERY LOW
Culture analysis	Gram positive bacteria were more prevalent in POE cases treated without IC antibiotics. Gram negative bacteria were more prevalent in cases treated with IC antibiotics.			1280 (12 studies)	⊕⊕◯◯ LOW
Risk factors for POE	Reported risk factors: older age, male, non-phacoemulsification cataract surgery, silicone IOL as opposed to acrylic IOL, clear corneal incision as compared to scleral tunnel, large incision size and posterior capsule rupture.			(7 studies)	⊕◯◯◯ VERY LOW

Results

Risk of POE with use of IC antibiotics

The cumulative incidence of POE was 0.068%, with a mean duration of 5.5 ± 1.1 days from cataract surgery to presentation.

The incidence of POE was significantly lower in eyes with IC antibiotics compared to those treated without (p<0.001, Figure 1, Table 1).

Efficacy of other peri-operative antibiotics

The risk of POE was significantly lower in eyes treated with IC and post-operative topical antibiotics compared to eyes treated with IC antibiotic alone (RR: 0.66, CI: [0.51, 0.86], p<0.01).

There was no statistically significant difference eyes treated with IC and pre-operative topical antibiotics compared to eyes treated with IC antibiotic) alone (RR: 0.80, CI [0.57, 1.12], p>0.05.

Conclusions

IC antibiotics reduce the risk of POE following cataract surgery, regardless of the agent selected. The overall incidence of endophthalmitis was low in both IC and non-IC groups.

Further studies are needed to compare efficacy between the different IC antibiotics and to identify adverse events associated with IC antibiotics.