

Cost-effectiveness analysis of iStent *inject*[®] implantation for the treatment of open angle glaucoma in Spain

Garcia-Feijoo J¹, Teus MA², Falvey H³, Aceituno S⁴, Appierto M⁴

1. Ophthalmology Unit, Hospital Clínico San Carlos, Instituto de Investigación Sanitaria del Hospital Clínico San Carlos (IdISSC), Madrid, Spain; 2. Hospital Universitario Príncipe de Asturias, University of Alcalá, Madrid, Spain; 3. Glaukos, San Clemente, California, United States; 4. Outcomes'10 S.L.U., Castellón de la Plana, Spain.

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OUTCOMES¹⁰

García-Feijoo's financial disclosure: Glaukos (C), Alcon (C), Santen (C), Istar (C), Allergan (C)

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PURPOSE

- Open angle glaucoma (OAG) is a chronic progressive pathology characterized by an increase in intraocular pressure (IOP), which may cause irreversible damage to eyesight¹.
- Micro-invasive glaucoma surgery (MIGS) devices are a valid alternative to control IOP in patients with OAG and can be performed in combination with cataract surgery².
- Implantation of the trabecular Micro-Bypass Stent, iStent *inject*[®], has demonstrated its efficacy and safety in patients with mild-to-moderate OAG, efficiently reducing IOP and medication use³.

Objective

- **This study aimed to evaluate the cost-effectiveness of combined glaucoma-cataract surgery with iStent *inject* vs. cataract surgery alone, to achieve IOP control and medication use reduction in patients with mild-to-moderate OAG under pharmacological treatment, from the perspective of the Spanish National Health System (NHS).**

METHODS

- A Markov model comparing the lifetime clinical course of OAG patients undergoing either **iStent *inject* combined surgery or cataract surgery alone.**
- In the analysis, patients progress irreversibly to different stages of OAG severity. Upon progression, patients receive selective laser trabeculoplasty, followed by trabeculectomy (subsequent treatment).
- **Efficacy data** (IOP and medication reduction) of main interventions and subsequent treatment were obtained from the literature¹⁻³ (Table 1).

Figure 1. Markov model structure

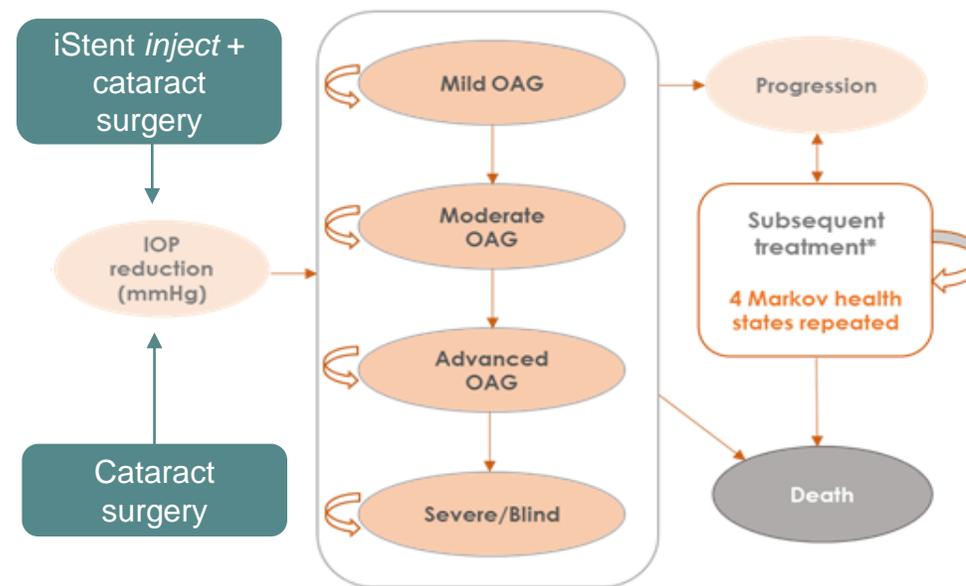


Table 1. Efficacy- medication reduction

	iStent <i>inject</i> + cataract (n ⁰)	Cataract surgery (n ⁰)
Baseline medication n	1.6	1.5
Medication reduction (1 ⁰ - year)	1.3	0.9
Medication use (1 ⁰ -year)	0.3	0.6
Medication reduction (2 ⁰ - year)	1.2	0.7
Medication use (2 ⁰ - year)	0.4	0.8
Source	Samuelson et al. 2019 ¹	

METHODS

- Costs (€, 2018):** 1) intervention (Table 2), 2) Patients' follow-up (Table 3), 3) Pharmacological treatment for IOP reduction, 4) Adverse events (AE) only AE with $\geq 3\%$ difference in occurrence, 5) Caregiver burden cost (societal perspective): monetary estimation of the time spent by the informal caregiver (Table 3)⁴.
- Outcomes:** incremental cost-utility ratio (ICUR). Both a willingness to pay (WTP) of 21 000 € and 30 000 € per quality-adjusted life year (QALY) gained⁶.
- Sensitivity analyses:** One-way (OWSA) and probabilistic sensitivity analyses (PSA) were performed to assess results robustness.

Table 2. Intervention costs

	iStent <i>inject</i> * ¹⁻³	Cataract surgery ^{1,2}
Cost of the procedure (€)	€ 1 928.91	€ 653.50

*cataract surgery + % Ambulatory major surgery

Table 3. Annual use of resources and cost

Resource	Glaucoma stage ^{2,4}				Unit cost ^{1,5} (€)
	mild	mod.	adv.	sev.	
Ophthalmologist*	2	3	4	3	€ 77.58
Gonioscopy	1	1	1	1	€ 24.65
Visual acuity test	2	2	3	2	€ 33.00
Visual function assessment^μ	2	2	4	2	€ 229.23
Caregiver burden (hours)	0	0	525	525	€ 16.1

* IOP measurement included; μ Includes the cost of ophthalmoscopy (28,98 €), TCO (48,34 €) and visual field analysis (151,92 €).

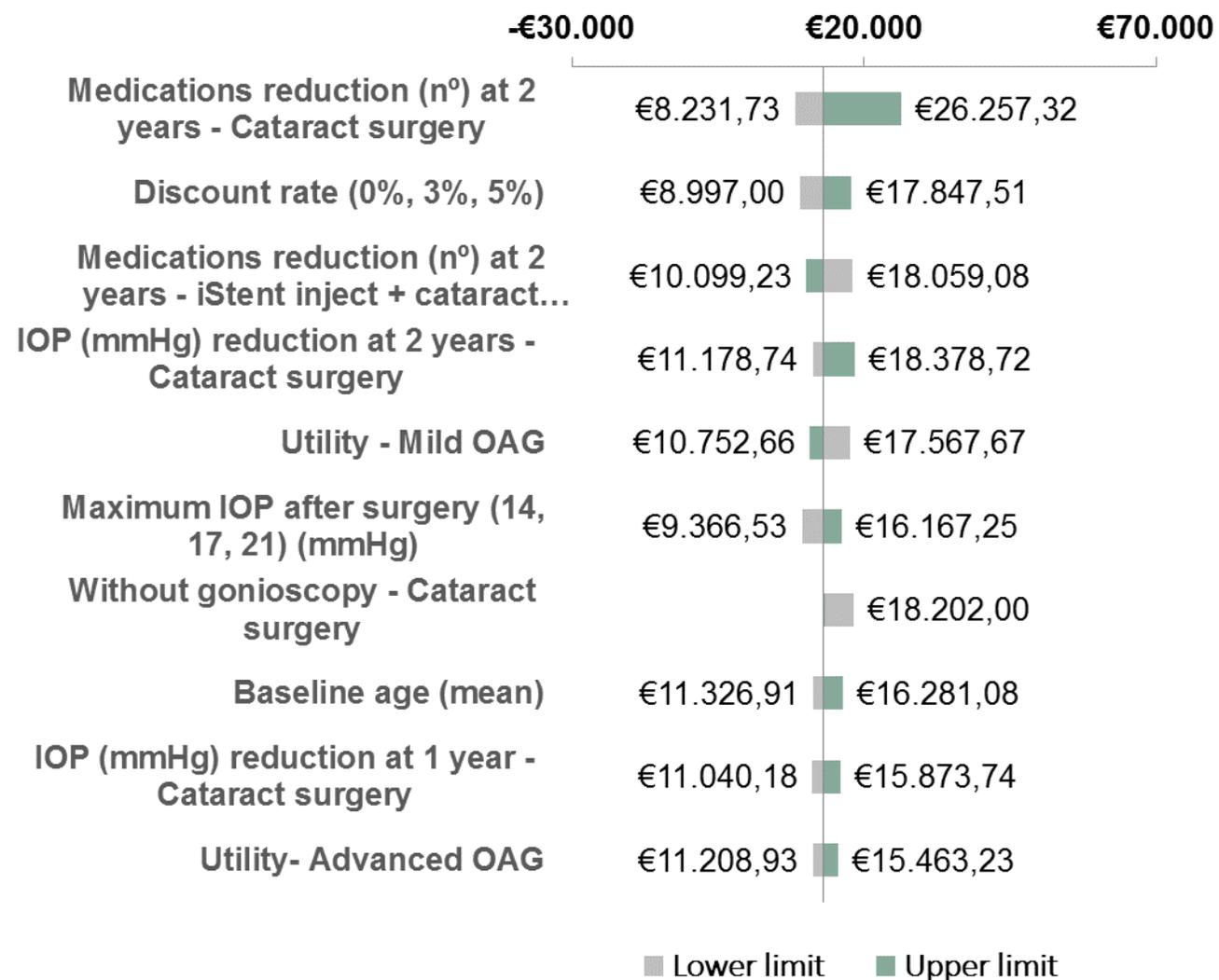
RESULTS

- From the **SNHS perspective**, iStent *inject* combined surgery was cost-effective compared to cataract surgery alone, with an ICUR of 13 077.45 €/QALY (Table 4).
- From the **societal perspective**, iStent *inject* combined surgery was cost-saving compared to cataract surgery alone.
- Results remained robust to the variation in the input data** (Figure 2): in the only case where ICUR exceeded the 21 000 €/QALY WTP, it remained below the 30 000 €/QALY WTP.

Table 4. Results

	iStent <i>inject</i>	Cataract surgery
Cost	€ 16 264.68	€ 15 262.62
QALYs	12.48	12.41
ICUR	€ 13 077.45	

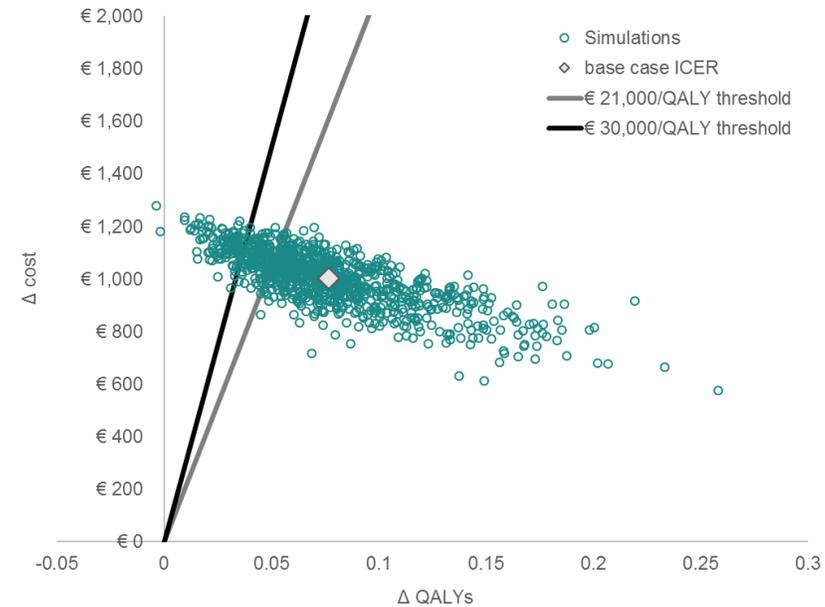
Figure 2. One-way sensitivity analysis



RESULTS

- The results of the **probabilistic sensitivity analysis confirmed the robustness of the results** (Figure 3).
- The probabilities of **iStent *inject* to be cost-effective** were:
 - 88.6% at a WTP of 30 000 € /QALY.
 - 76.1% at a WTP of 21 000 € /QALY.

Figure 3. Probabilistic sensitivity analysis



CONCLUSIONS

- The improved IOP control of *iStent inject* translates into reduced disease progression and additional benefit in terms of quality adjusted life years (QALYs). Because of this, *iStent inject* combined surgery provides good value for money in patients with mild-to-moderate OAG, being cost-effective (SNHS perspective) or cost-saving (societal perspective) compared to cataract surgery alone.