

THE DIRECT COSTS ASSOCIATED WITH POSTERIOR CAPSULE OPACIFICATION IN THE NETHERLANDS: A PAYER PERSPECTIVE

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BACKGROUND AND OBJECTIVE

- Cataract surgery is the most frequently performed surgical procedure in the Netherlands¹ with average annual crude rate of 9.36 per 1000 population performed between 2015²
- Posterior capsule opacification (PCO) is the most common post-surgical complication of cataract surgery with the incidence ranging from <5% to as high as 50%².
- PCO affecting patient's visual acuity is treated by Nd:YAG capsulotomy which is generally considered safe, but is associated with complications such as retinal detachment (RD), glaucoma and cystoid macular edema³⁻⁸
- PCO development is heavily dependent on the choice of intraocular lens (IOL) for cataract surgery and AcrySof IOLs have consistently demonstrated lower Nd:YAG rates compared to other IOLs, with 1 and 3 year estimates reported as low as 0.6% and 2.4%, respectively.⁹
- The objective of this research was to estimate annual direct medical costs associated with the treatment of PCO in the Netherlands.

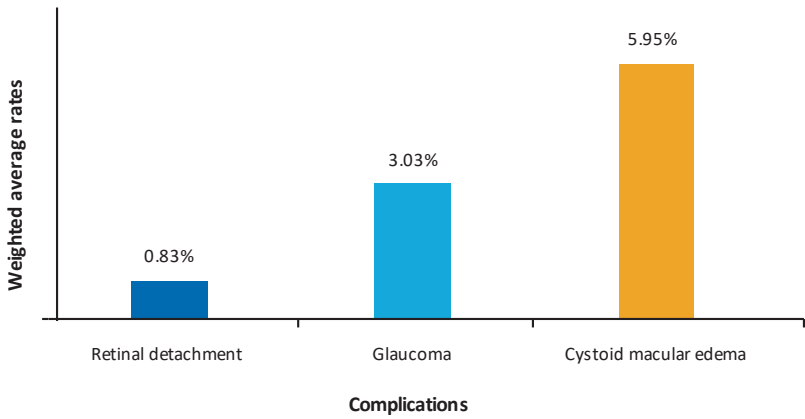
METHODS

- An interactive analytic model was built using MS ExcelTM to estimate the total direct annual costs associated with PCO in the Netherlands.
- An estimate for the rate of Nd:YAG capsulotomy in the Netherlands was derived from publically available statistics, as were estimates for the number of cataract surgeries performed annually (Table 1)
- Cost categories such as associated follow-up consultations (1-per Nd:YAG procedure)¹⁰ and associated (1-year) clinical complications were attained from the published literature.¹¹
- Costs were based on average national tariffs (2015-2019) (Table 1).²
- Sensitivities of -20% and +20% were applied to PCO associated costs.

Model inputs

- One-year post-Nd:YAG capsulotomy incidence of RD, glaucoma, and CME, were estimated using weighted average of published rates from studies retrieved through a systematic literature search¹⁶ (Figure 2)

Figure 2. Estimated rates of complications at 1 years post Nd:YAG capsulotomy



Nd:YAG = neodymium-doped yttrium aluminium garnet laser
Source: One-year post- Nd:YAG capsulotomy incidence of retinal Detachment, glaucoma, and cystoid macular edema were estimated using weighted average of published rates from studies retrieved through a systematic literature search¹⁶

- Considering a payers’ perspective, direct treatment costs were considered including Nd:YAG capsulotomy costs and costs of treating complications due to Nd:YAG capsulotomy, i.e. RD, glaucoma, and CME

- For the analysis, a 1-year time horizon was considered, the time period post-cataract surgery over which Nd:YAG capsulotomy rates and the associated complications were assessed

Table 1. Model inputs

Parameters	Year	Estimate
Number of cataract procedures ²	2015	158,415
Number of Nd:YAG procedures ²		45,940 (29%)
Costs		
Nd:YAG capsulotomy ²	2015–19	€235
Retinal detachment ²	2015–19	€2276
Glaucoma ²	2015–19	€ 310
Cystoid macular edema ²	2015–19	€150
Associated follow-up visit ²	2015–19	€80

Model outputs

- In terms of health system direct costs in the Netherlands, the following model outputs were assessed:
- Number of Nd:YAG capsulotomy procedures
- Associated clinical complications

Sensitivity analysis

- ±20% sensitivities were applied to all PCO related costs to allow for estimates which take into account potential geographic variation in reported costs.

RESULTS

Components of direct medical costs to the Dutch health care system

- We estimate that 45,940 Nd:YAG capsulotomy procedures are performed annually to treat PCO in the Netherlands.
- Frequencies of subsequent follow-up consultations and associated complications are presented in Table 2

Table 2. Components of estimated total annual direct medical costs associated with PCO in the Netherlands

Based on a total number of cataract surgeries of 158,415

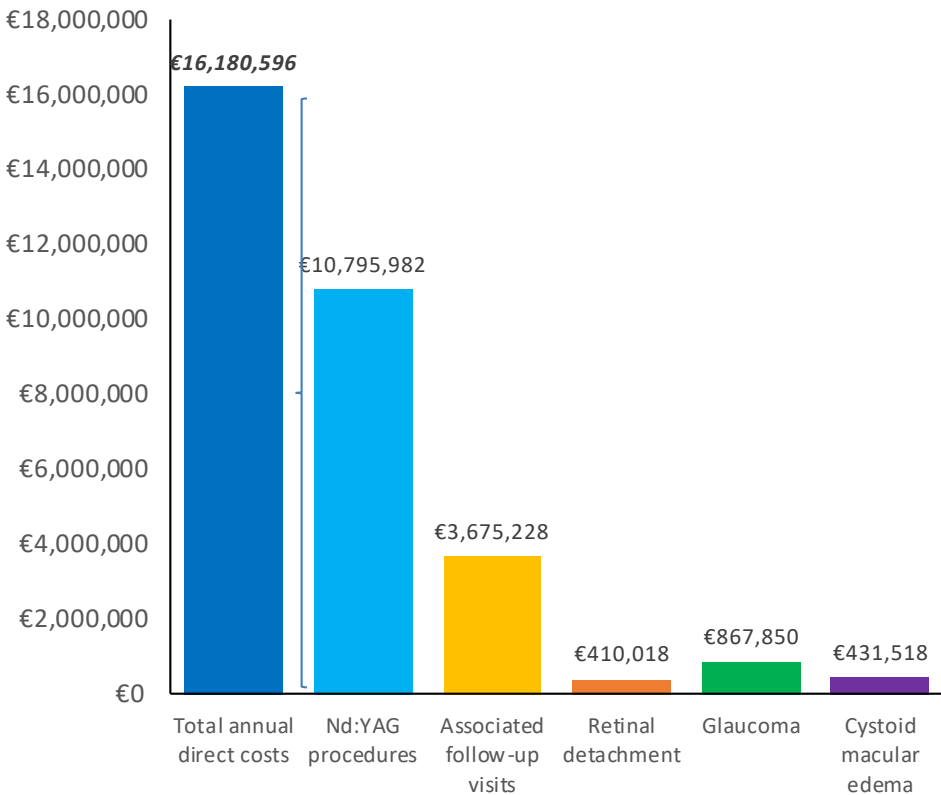
Nd:YAG procedures	45,940
Associated follow-up visits	45,940
Associated complications	
Retinal detachment	381
Glaucoma	1,392
Cystoid macular edema	2,733

CME = cystoid macular edema, IOL = intraocular lens, Nd:YAG = neodymium-doped yttrium aluminium garnet laser, RD = retinal detachment

Cost results

- Total direct medical costs associated with treating PCO and its associated complications were estimated at €16.2 million annually and is presented alongside its constituent parts in Fig 2
- Applying ±20% sensitivities to the overall direct medical costs results in an estimated range of €12.9 to €19.4 million.

Figure 3. Total annual direct medical costs associated with PCO in the Netherlands



CONCLUSIONS

- Treating PCO and its associated complications bears a significant cost and its provision can place a burden on resource constrained health care systems.
- Here we estimated the total annual direct medical costs associated with treating PCO in the Netherlands as being in the range of €12.9 to €19.4 million.
- The optimal choice of IOL for cataract surgery offers the opportunity to reduce these costs. More research is warranted with respect to estimating direct non-medical costs and indirect costs associated with treating PCO.

References

- Eurostat. Surgical operations and procedures performed in hospitals by ICD-9-CM, (2017)
- Netherlands Healthcare activity <https://www.opendisdata.nl/msz/zorgactiviteit/030898>
- Fong C.S. et al. Am J Ophthalmol., 157(1), 171–179, (2014)
- Karahan E. et al. Med Hypothesis Discov Innov Ophthalmol., 3(2),45–50 (2014)
- Lundstrom M. et al. Journal of cataract and refractive surgery, 38(6), 1086–1093 (2012)
- Bhargava R. et al. International journal of ophthalmology, 8(3), 590–596 (2015)
- Ozyol E. et al. Graefes Arch Clin Exp Ophthalmol., 252(1), 71–75 (2014)
- Sheard R.M. et al. Journal of cataract and refractive surgery, 29(5), 930–934 (2003)
- Ursell, Paul G., et al.. Eye 32.10 (2018): 1579.
- Aaronson, A et al. and Acta ophthalmologica (2019).
- OBoyle D. et al. Post-Nd:YAG laser complications in cataract patients treated for posterior capsular opacification: a systematic literature review, Poster presented to ISPOR 2018

Disclosure

OJB, RB, LdR, CPV & DOB are employees of Alcon
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