

# POSTERIOR CAPSULE OPACIFICATION AFTER CATARACT EXTRACTION AND RELATED HEALTHCARE COSTS IN GERMANY

## A claims data analysis on the impact of the implanted type of intraocular lenses

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### Background and Objective

Cataract extraction is the most frequent operative procedure worldwide. The clouded natural lens is replaced by an artificial intraocular lens (IOL) implant, in most cases a hydrophobic or hydrophilic acrylic IOL. The most common long-term complication after cataract surgery is the development of a posterior capsule opacifications (PCO) which is treated by Nd:YAG laser capsulotomy. The aim of this study was to assess real world data on the impact of different IOL material types on the incidence of post-operative PCO treatment as well as associated follow-up costs from a Statutory Health Insurance (SHI) perspective in Germany.

### Methodological Approach

#### Approach

- Retrospective analysis
- 4-year follow-up
- Assessing the impact of two different IOL material types (hydrophobic and hydrophilic acrylic)

#### Measurement Overview

- Incidence of PCO measured by incidence of Nd:YAG laser capsulotomy after cataract extraction in relation to hydrophobic and hydrophilic acrylic IOL implantation in current German practice
- Associated costs of Nd:YAG laser capsulotomy due to PCO after cataract extraction from a SHI perspective

#### Data

- Anonymized claims data from the Institut für angewandte Gesundheitsforschung (InGef)
- Covers approximately 6.7 million insured persons from different German SHIs
- Representative for the German population with regard to age and sex
- Includes demographic information, diagnoses, utilization of ambulatory services, hospitalizations, reimbursed drugs, remedies and aids on a patient individual level

#### Methods

- Including patients who underwent cataract extraction and implantation of either an acrylic hydrophobic or hydrophilic IOL in 2010
- Assessing clinical outcomes and comparing direct costs in a 4-year follow-up period after cataract surgery

### Sample

#### Study Population and Subgroup Comparison

- Total 3,025 patients included
- 2,078 patients obtained a hydrophobic IOL (study population A: Hydrophobic IOL) and 947 patients got a hydrophilic implant (study population B: Hydrophilic IOL)

|                             | Study population A Hydrophobic IOL |            | Study population B Hydrophilic IOL |            | p value* |
|-----------------------------|------------------------------------|------------|------------------------------------|------------|----------|
|                             | Total                              | Percentage | Total                              | Percentage |          |
| Age, Mean (SD)              | 72.79                              | (8.41)     | 73.64                              | (8.44)     | 0.0099   |
| Females                     | 1233                               | 59.34      | 543                                | 57.34      | 0.3009   |
| Retinal detachment and tear | 41                                 | 1.97%      | 17                                 | 1.80%      | 0.8864   |
| Glaucoma                    | 376                                | 18.09%     | 183                                | 19.32%     | 0.4194   |
| Diabetes mellitus           | 615                                | 29.60%     | 305                                | 32.21%     | 0.1477   |
| Hypertension                | 1,536                              | 73.92%     | 701                                | 74.02%     | 0.9644   |
| Charlson index, Mean (SD)   | 2.00 (1.96)                        |            | 2.03 (1.99)                        |            | 0.6947   |
| Cytostatic                  | 21                                 | 1.01%      | 6                                  | 0.63%      | 0.4054   |
| SSRI                        | 109                                | 5.25%      | 38                                 | 4.01%      | 0.1711   |
| Cortisone                   | 1,129                              | 54.33%     | 471                                | 49.74%     | 0.0205   |

\*Fischer's exact test; gender, comorbidity and medication, Welch's test: Age and Charlson Index, Local significance level  $\alpha = 0.005$  after Bonferroni correction

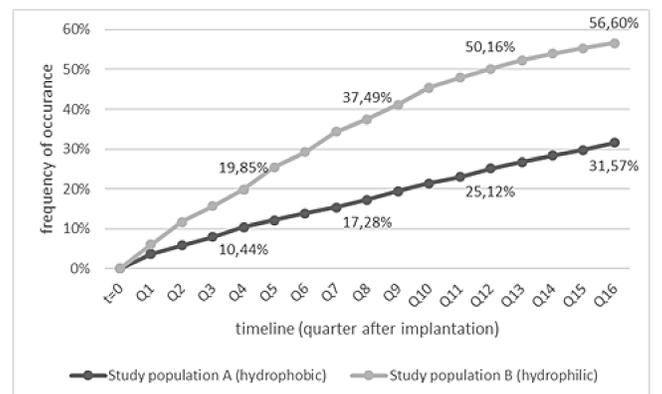
Using Bonferroni correction to adjust for multiple testing, no between-group differences in the preoperative characteristics was found

### Results

#### Clinical Impact

Since PCO is the most frequent complication after IOL implantation, its incidence rate is a valid indicator of treatment quality

- Incidence of PCO was identified in patients who underwent Nd:YAG laser capsulotomy
- PCO treatment in 4-year follow-up period significantly ( $p < 0.0001$ ) lower for patients with a hydrophobic IOL implant (study population A)



#### Economic Impact

The economic analysis compared direct costs over a period of 48 months after cataract surgery from an SHI payer perspective

|   | Study population A Hydrophobic IOL   |             | Study population B Hydrophilic IOL |             |         |
|---|--|-------------|------------------------------------|-------------|---------|
|   | Sum  | Per patient | Sum                                | Per patient |         |
| Total number of patients                | 2078   |             | 947                                |             |         |
| Number of billed fee schedule positions | laser-surgical intervention of category W1                                     | 1058        | 0.51                               | 849         | 0.90    |
|   | postsurgical monitoring  | 961         | 0.46                               | 773         | 0.82    |
|   | postoperative treatment (referral)   | 83          | 0.04                               | 41          | 0.04    |
|   | postoperative treatment (surgeon)  | 773         | 0.37                               | 628         | 0.66    |
| Cumulative costs per treatment          | laser-surgical intervention of category W1 (78.68 € per fee schedule position) | 83,243.44 € | 40.06 €                            | 66,799.32 € | 70.54 € |
|   | postsurgical monitoring (14.69 € per fee schedule position)                    | 14,117.09 € | 6.79 €                             | 11,355.37 € | 11.99 € |
|   | postoperative treatment (referral) (13.46 € per fee schedule position)         | 1,117.18 €  | 0.54 €                             | 551.86 €    | 0.58 €  |
|   | postoperative treatment (surgeon) (7.09 € per fee schedule position)           | 5,480.57 €  | 2.64 €                             | 4,452.52 €  | 4.70 €  |
| Costs PCO treatment                     | 103,958.2 €  | 50.03 €     | 83,159.07 €                        | 87.81 €     |         |

- Follow-up capsulotomy after IOL implantation is usually performed in outpatient settings in Germany
- Costs are valued by means of the German National Ambulatory Evaluation Scheme of 2014
- Average postoperative costs due to PCO treatment for patients with hydrophilic IOL are about 75 % higher compared to patients with hydrophobic IOL implants

### Discussion and Implications

Considering the high prevalence of cataract, the economic burden associated with treatment of long-term complications after cataract extraction is of great relevance for the German SHI. Implanting hydrophobic lenses seems to be superior regarding both medical and economic results.

