ORIGINAL ARTICLE

The Cataract Surgery Survey in Slovakia, EU, 2008–2010

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SUMMARY

The Cataract Surgery Survey in Slovakia, E.U., in 2008–2010

Authors in retrospective study give the results of cataract surgery in Slovak Republic since 2008 to 2010. There are compiled results of the filled forms from all ophthalmology centers where cataract surgery were done, in this study.

Key words: cataract, phacoemulsification, corneal incision, anaesthesia, YAGcapsulotomy

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INTRODUCTION

The method of phacoemulsification was introduced into practice by Charles Kleman (New York, 1967), and since then cataract surgery has experienced rapid development (1). Cataract surgery is becoming increasingly sophisticated hand in hand with technological development, is becoming safer and quicker for the patient, and can now be performed as an outpatient operation, which brings financial benefit.

MATERIAL AND METHOD

The data was obtained by a retrospective processing of questionnaires from the individual workplaces performing cataract surgery in Slovakia from 1 January 2008 to 31 December 2010. In this publication we present numerical data from primary and secondary cataracts in individual years, the proportion of operations of state and private centres in cataract surgery. We also present the numbers of surgeons and their age range. We observe the used surgical techniques, localisation of main incision, percentage of necessity of suture of the surgical wound. Prevention of endophthalmitis is essential in cataract surgery. Good preparation of the operating field is demonstrably effective against the development of postoperative infections. Because the majority of endophthalmitis is caused by pathogens from the conjunctiva and eyelashes, sterilisation of the conjunctival fornix is important (2). In the publication we present a report on preoperative preparation of the operating field, as well as use of antibiotics in cataract surgery. At present it is possible to use a large range of options in cataract and refractive surgery. One of these is use of artificial intraocular lenses of various designs, which provide patients with a higher quality of life after the operation (3). In the article we present the proportion of monofocal and multifocal lenses implanted in individual years as well as the proportion of aspherical and spherical designs of lenses. We also observe the proportion of materials of the used implants. We have divided the processed data from the questionnaires into two groups: I (Group I) – primary cataract surgery and II (Group II) – secondary cataract surgery.

RESULTS

In the individual years questionnaires were delivered to all workplaces performing cataract surgery in Slovakia. In 2008 36 workplaces were performing cataract surgery, and all of these submitted a completed questionnaire (100 %). In 2009 cataract surgery was performed in 37 workplaces, 36 of which submitted a questionnaire (97.3 %). In 2010 cataract surgery was performed in 40 workplaces, 38 of which submitted a questionnaire (95 %).

Group I Results (primary cataract surgery)

In the three observed years a total of 83 186 primary cataract operations were performed in Slovakia. The total number of primary cataracts in 2008, 2009 and 2010, as well as the total number of submitted questionnaires, is summarised in table 1.

The proportion of state and private workplaces in primary cataract surgery is in favour of state institutions in all years, by more than 67 %. The total number of primary cataracts operated on in the individual years in state and private workplaces is summarised in table 2.

In more than 96.6% of primary cataract operations the technique of phacoemulsification was used, and this percentage did not increase from year to year. This technique reduces the occurrence of early complications, accelerates healing and rehabilitation of vision. In the majority of cases of cataracts, phacoemulsification is the standard surgical technique at the present time (1). The used techniques for cataract surgery, as well as the absolute numbers thereof are summarised in table 3.

It is a positive development that a progressive reduction in the number of hospitalisations is taking place upon primary cataract surgery, from 28.8% in 2008 to 21.3% in 2010. The total proportion of primary cataracts operated on within the framework of outpatient surgery and hospitalisation is summarised in table 4.

Table 1. Number of primary cataracts operated on in Slovakia from submitted questionnaires

Year	Total number of submitted questionnaires from workplaces performing cataract surgery in Slovakia	Number of primary cataracts
2008	36 (100% of workplaces)	26 142
2009	36 (97.3% of workplaces)	28 234
2010	38 (95% of workplaces)	28 810

Table 2. Number of primary cataract operations in state and private workplaces

Year	Number of primary cataracts operated on in state workplaces	Number of primary cataracts operated on in private workplaces
2008	17 608 (67.4 %)	8 534 (32.6%)
2009	20 436 (72.4%)	7 798 (27.6%)
2010	20 085 (69.7%)	8 725 (30.3%)

Table 3. Used cataract surgery technique in individual years

Used operating technique	Number in 2008	Number in 2009	Number in 2010
Phacoemulsification	25 253 (96.6%)	27 554 (97.6%)	28 230 (97.9%)
Extracapsular	786	572	421
Intracapsular	62	27	45
Pars plana phacoemulsification	41	88	114

Table 4. Number of cataracts (in %) operated on within outpatient surgery and with hospitalisation

Year	% of cataracts operated on in outpatient surgery	% cataracts operated on with hospitalisation of patient
2008	71.2%	28.8%
2009	73.1%	26.9%
2010	78.7%	21.3%

Table 5. Number of cataract surgeons in Slovakia in individual age categories and years

Age of surgeon	2008	2009	2010
Less than 40 years	39	32	29
40- 50 years	28	32	33
50-60 years	33	30	28
Over 60 years	8	6	8

In 2008 primary cataract surgery was being performed by 108 surgeons, and the number of cataracts per 1 surgeon was 242. In 2009 there were 100 surgeons performing cataract operations and the number of cataracts per 1 surgeon was 282. In 2010 the lowest number of surgeons in the course of the 3 years were performing cataract surgery, i.e. 98, and the number of cataracts per 1 surgeon was 294. The age range and the number of surgeons is summarised in table 5.

Local anaesthesia is used more frequently in cataract surgery than general anaesthesia (4). Over the course of the three observed years, general anaesthesia was used in a maximum of 5.2% of cataract operations (2008: 4.69 %, 2009: 5.0 %, 2010: 5.2 %). The most frequently used anaesthesia in Slovakia is combined anaesthesia – topical (TA) with another type. In 2008 this was a combination of TA and peribulbar anaesthesia in 32.67% of cases, in 2009 also TA and peribulbar in 32% and in 2010 TA and intracameral in 36%. In 2010 we recorded an increase of topical anaesthesia to up to 35% of operations.

The small incision technique is performed via a corneal or scleral tunnel (2). Corneal incision is unequivocally preferred in Slovakia, performed in 85.51% of cases in 2008, 90.1% in 2009 and 92.7% in 2010. The most frequent localisation of the corneal incision is on 12 o´clock in up to 82% of cases, and the least performed is temporal localisation, in only up to 4.3%.

The regular protocol for preparation of the operating field resides in thorough sterilisation of the operating field, namely of the conjunctival sac and surrounding area of the eye. Worldwide, rinsing of the conjunctival sac and surrounding area of the eye with 5% povidone-iodine (Betadine) solution before surgery is regarded as of more fundamental importance than the preoperative administration of antibiotics (2). In Slovakia this preoperative sterilisation of the operating field was used in 95% of cases in 2009 and in 99.9% of operations in 2010. Prophylactic preparation with antibiotics and anti-inflammatory drugs is not unavoidable, but a large proportion of workplaces use this method (6). In Slovakia prophylaxis with antibiotics within the framework of preoperative preparation was used in up to 90% of cases in all three observed years. Shortly before the end of the operation, in up to 65% of operations, surgeons applied antibiotics into the anterior chamber. In 15% of cases surgeons applied antibiotics postoperatively subconjuntivally, and 9-15% did not use antibiotics during surgery whatsoever over the course of the observed 3 years.

The optimal model of an artificial intraocular implant (IOL) as compensation for the lens after removal of a cataract is chosen by the surgeon after consultation with the patient. The surgeon therefore selects an intraocular lens not only according to the calculated dioptres, but also according to the material, design and dimensions. The lenses are manufactured from two materials: acrylate and silicon (2). During the course of the observation period, acrylate lenses were used in 95% or more cases in Slovakia. Hydrophilic acrylate was implanted in 59.5% of cases in 2009, with a slight reduction to 53.7% in 2010. Hydrophobic acrylate was implanted in 35.3% of cases in 2009 and 36.9% in 2010. The majority of currently implanted IOL are monofocal, which means that they refract light only into one focal

Table 6. Number in (%) of used IOL in Slovakia in individual years

Type of IOL	2008	2009	2010
Aspherical IOL	36%	40.8%	51.73%
Accommodating IOL	0.2%	0.3%	0.09%
Multifocal IOL	0.1%	0.2%	1.01%

Table 7. Solution of secondary cataract in Slovakia in individual years

Type	2008	2009	2010
YAG capsulotomy	74.79%	79.5%	81.1%
Discision of posterior capsule	0.63%	1.4%	0.5%
Pars plana capsulectomy	4.15%	5.1%	5.4%
Polishing of posterior capsule	20.43%	14%	13%

point on the retina. Another group of IOL is multifocal lenses, which have two or more focal points. However, in Slovakia the use of multifocal IOL was only up to 1.01% during the observation period. Implanted intraocular lenses according to focal points and shape are summarised in table 6.

Group II Results (secondary cataract surgery)

Despite advances in cataract surgery, opacification of the posterior capsule of the lens (PCO) remains the most frequent complication. The incidence of PCO varies. The total number of secondary cataract operations over the three observed years was 18 734. State workplaces performed a larger proportion of operations. In 2008 state workplaces performed 4 361 out of a total number of 5 623 operations (77.5%). In 2009 state workplaces performed 5 109 operations out of a total number of 6 407 (81%). In 2010 the number of operations in state workplaces was 5 602 (83.6%) and in private 1 102 (16.4%). In all three years the most widely used surgical procedure was YAG capsulotomy, within the range of 74–81.1%. The surgical procedures and their percentage representation in the individual years are summarised in table 7.

DISCUSSION

Surgical treatment of cataracts has a history dating back more than 2000 years. The aim of cataract surgery is to remove the lens opacity and replace it with an artificial intraocular lens (2). Today, however, cataract surgery is moving into the area of the refractive position, with use of intraocular lenses and advanced technology, and through the use of a femtosecond laser. The technique of cataract surgery is constantly changing as a result of the introduction of new technologies. In principle we can divide the techniques into intracapsular and extracapsular. Some of the techniques are now history, others are used less frequently, whilst others are the present day standard in developed countries, and certain techniques are completely new. The most frequently used technique in developed countries at present is phacoemulsification by ultrasound, which is used in up to 97% of cases in Slovakia. Worldwide the preferred technique is by small incision, namely corneal incision. The structure of the corneal incision is self-sealing, and in most cases does not require a suture. In the processed group of patients a suture was required in only 1.1% of operations. The use of a corneal incision shortens the operating time, and the wound is more resistant to dehiscence. By using corneal incision we avoid the capillaries, which reduces the possibility of perioperative and postoperative haemorrhage. The trend of corneal incision is also widespread in Slovakia, used in up to 90% of cases. The process which blocks the pain during the operation is anaesthesia. Zhao et al. in a comparative study of retrobulbar (RBA), peribulbar (PBA) and topical (TA) anaesthesia came to the conclusion that in comparison with RBA and PBA, TA does not ensure such excellent analgesis, but ensures a comparable surgical result and reduces the amount of complications in connection with the use of injection, and alleviates the patient's fear of injection. Despite its advantages, TA is not suitable for patients with high blood pressure and heightened perception of pain (5). This fact is respected in cataract surgery also in Slovakia, where TA is used in 35% of operations. Although endophthalmitis may develop after every eye operation, the largest number of cases are in connection with cataract surgery (7). A significant area for the development of postoperative endophthalmitis is prevention prevention. Disinfection and rinsing of the conjunctival sac preoperatively with Povidonum iodinatum solution (Betadine) is of far greater value in the prevention of endophthalmitis than the administration of antibiotic drops preoperatively (8). In our observed patients, Betadine was used in 99.9% of preoperative preparation in 2010. There are various opinions concerning prophylactic administration of antibiotics. Some authors stand by the view that it is not necessary to apply any antibiotics locally preoperatively, and if any are applied then they should always be quinolones (2 hours before operation every 15 minutes). Fourth generation quinolones appear to be the correct prophylactic antibiotic due to their wide spectrum and method of effect and penetration (9). We determined prophylactic use of antibiotics preoperatively in up to 90% of operations. The development of IOL is constantly progressing, and brings not only new types but also new indications for their use, such as refractive surgery, in which the patient's own lens may be removed (clear lens extraction) and replaced with a suitable IOL. The proportion of accommodating and multifocal IOLs used in cataract surgery in Slovakia however is within a very small percentage (up to 1.01%). Posterior capsular opacification (PCO) is the most frequent complication following cataract surgery. The causes are multifactorial (2, 10). The first factor is the patient him/herself, in which above all age plays an important role, the second factor is the technique of cataract surgery (size of capsulorhexis and sufficient aspiration of lens material) and the third is the shape and material of the artificial intraocular lens (10). Pharmacological reduction of PCO is in the stage of research, and opening of the posterior capsule by a size of approx. 3-4 mm by Nd:YAG laser is becoming the standard treatment. This type of treatment has replaced polishing of the posterior capsule or surgical discision in Slovakia, and in 2010 was used in up to 81.1% of cases of PCO.

CONCLUSION

It has been possible to submit a report on cataract surgery in Slovakia over the three observed years only on the basis of co-operation with individual state and non-state centres in completing questionnaires, for which these institutions deserve our warmest thanks.

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