

Management of Cataract in the Thai Population

Yosanan Yospaiboon MD*, Kasem Yospaiboon MD*,
Tanapat Ratanapakorn MD*, Suthasinee Sinawat MD*,
Thuss Sanguansak MD*, Chavakij Bhoomibunchoo MD*

* Department of Ophthalmology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Objective: To analyze the types of cataracts, surgical procedures, hospital charges and length of stays among the Thai population.

Material and Method: Information on cataracts among out- and in-patients in the fiscal year 2010 was retrieved from the databases of the three main national health insurance schemes. The data were analyzed according to the types of cataract, surgical procedures, hospital charges and length of stays.

Results: There were 654,352 out-patient visits and 146,994 in-patient admissions in the fiscal year 2010. The number of cataract patients was greatest among 61-80 year-olds. Senile cataract was the most frequent type of cataract (97.11%) followed by traumatic (0.59%), infantile, juvenile and pre-senile (0.45%), complicated (0.15%) and drug-induced (0.02%). Phacoemulsification with intraocular lens implantation was the most common surgical procedure used to restore vision among the elderly (83.07%). The average health expenditure for cataract was 18,527 baht and length of hospital stay 2.35 days.

Conclusion: Cataracts and their management in the Thai population were analyzed. For health economic reasons, all cataract surgeries should be on an out-patient basis unless otherwise approved. Prospective studies should be designed to assess the relevant data on specific cataracts and the associated risk factors.

Keywords: Types of cataract, Surgical procedures, Hospital charges, Length of stay

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Cataract is recognized as the leading cause of visual impairment and blindness in the world, including in Thailand⁽¹⁻³⁾. It is estimated that at least 50% of the blindness occurring in developing countries is due to cataracts⁽¹⁾. Although cataract blindness is primarily age-related and therefore not preventable, it is completely treatable by surgery. Nowadays, millions of cataract surgeries are performed worldwide to restore the vision of people over 60.

Over the past 15 years, developments in science and technology have resulted in numerous innovations vis-a-vis cataract surgery; thus, it has rapidly evolved from intracapsular to extracapsular extraction and phacoemulsification. Post-operative visual rehabilitation has also shifted from spectacles and contact lenses to intraocular lenses⁽⁴⁾. Advanced cataract surgery with intraocular lens implantation is now the most effective surgical procedure for

management of cataract.

In Thailand, cataract surgery is the procedure most frequently being reimbursed for in-patients from the main national health insurance schemes. The reimbursement cost, however, is markedly lower for out-patient than for in-patient surgery so this predominance will lessen dramatically as cataract treatment shifts to an out-patient basis.

The objective of the present study was to analyze the burden of cataract disease in the Thai population and its management. The information revealed may be useful in policy development for improving the cataract care delivery system in the nation.

Material and Method

The present study is part of the "Analysis of Eye Health in the Thai Population" described elsewhere. The authors analyzed both the in- and out-patient data for the fiscal year 2010 (October 1, 2009 and September 30, 2010) from the main national health insurance schemes. The schemes included: the universal coverage (UC) scheme from the National Health Security Office,

Correspondence to:

Yospaiboon Y, Department of Ophthalmology, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.
Phone: 043-348-383
E-mail: yosanan@kku.ac.th

the social security (SS) scheme from the Social Security Office and the Civil Servants Medical Benefit (CSMB) scheme from the Comptroller General's Department. Combined, these three schemes provide coverage for more than 96% of the total population.

Data included both in- and out-patient data from the UC and SS schemes, and in-patient data from the CSMB scheme. Data on disorders of the lens (H25-H28) were extracted and classified. The types of cataract in the present study consisted of (a) senile cataract (H25) (b) other cataract (H26) and (c) cataract in diseases classified elsewhere (H28). Excluded were (a) after-cataract (H26.4) (b) aphakia (H27.0)) and (c) dislocation of lens (H27.1). The data were checked for accuracy and analyzed for number of out-patient visits, in-patient admissions, types of cataract, surgical procedures, medical expenses and length of hospital stays. The basic statistical analysis of variables was performed using SPSS for Windows version 16. After analyzing the data, the research team checked the validity of the information.

Results

The UC and SS schemes recorded 654,352 out-patient visits, while the UC, SS and CSMB schemes recorded 146,994 admissions. Cataracts accounted for the majority of disorders of the lens (144,800 of 146,994; 98.51%). The age distribution of the out-patient visits and in-patient admissions were similar (Fig. 1 and 2). It was noted that 65-70% of cataract patients were in the 61-80 year-old age range while about 90% were in the broader 41-80 year-old age range.

The types of cataract in order of decreasing frequency are presented in Table 1. Senile cataract accounted for 97.11% of total cataract admissions followed by traumatic cataract (0.59%), infantile, juvenile and pre-senile cataract (0.45%) and complicated cataract (0.15%). Among senile cataracts, the combined form of cortical, nuclear and posterior subcapsular cataract was the most common type (40.68%) followed by the nuclear type (36.25%), the incipient cataract (13.25%) and the Morgagnian type (9.82%).

The surgical procedures for management of each type of cataract are presented in Table 2. Phacoemulsification with intraocular lens implantation was the most common surgical procedure for all types of cataract (83.07%). This technique was most commonly used for treatment of the nuclear type of senile cataract (93.24%), followed by the incipient cataract (90.44%) and less commonly for the Morgagnian type of senile cataract (55.97%) and the traumatic cataract (50.18%). Among

patients with a diagnosis of cataract and having cataract surgery using any technique, there were 1,472 records with an ICD-10 code of T81 (complications of procedure, not elsewhere classified).

Hospital charges sent for reimbursement were used to represent health expenditures for cataract. The average expenditure for senile cataract in all age groups was 18,527 baht, compared to 17,156 baht for other types of cataract. The hospital charges for phacoemulsification, extracapsular extraction and intracapsular

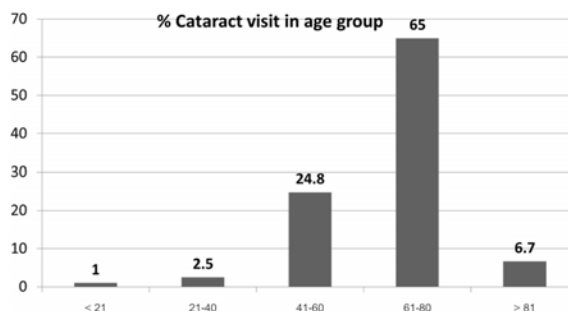


Fig. 1 Percentage of out-patient visits for cataracts according to age groups

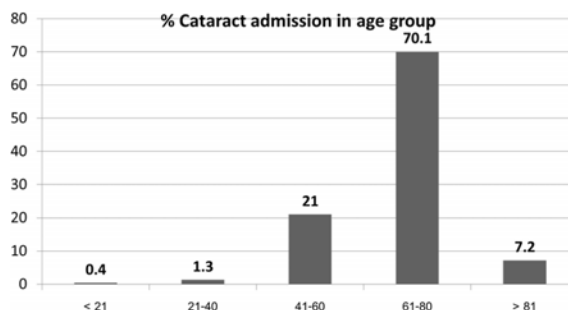


Fig. 2 Percentage of admissions for cataracts in different age groups

Table 1. Number of admissions for cataracts by type of cataract

Type of cataract	Number	Percentage
Senile	140,618	97.11
Traumatic	851	0.59
Infantile, juvenile & pre-senile	646	0.45
Complicated	222	0.15
Drug-induced	24	0.02
Other, not specified	2,439	1.68
Total	144,800	100.00

Table 2. Number of admissions for cataracts by type of cataract and surgical procedure

Type of Cataract	PE n = 120,294 (83.07%)	ECCE n = 3,189 (2.2%)	ICCE n = 692 (0.48%)	Not specified n = 20,625 (14.24%)	Total n = 144,800 (100%)
H25.0 Senile incipient	16,856 (90.44%)	131 (0.70%)	78 (0.42%)	1,573 (8.44%)	18,638 (100%)
H25.1 Senile nuclear	47,525 (93.24%)	624 (1.22%)	96 (0.19%)	2,724 (5.35%)	50,969 (100%)
H25.2 Senile, Morgagnian type	7,729 (55.97%)	350 (2.53%)	121 (0.88%)	5,610 (40.62%)	13,810 (100%)
H25.8 Other senile (combined)	45,674 (79.85%)	1,941 (3.39%)	193 (0.34%)	9,393 (16.42%)	57,201 (100%)
H26.0 Infantile, juvenile and pre-senile	482 (74.61%)	25 (3.87%)	2 (0.31%)	137 (21.21%)	646 (100%)
H26.1 Traumatic	427 (50.18%)	17 (1.20%)	54 (6.34%)	353 (41.48%)	851 (100%)
H26.2 Complicated	162 (72.97%)	2 (0.90%)	5 (2.25%)	53 (23.88%)	222 (100%)
H26.3 Drug-induced	18 (75%)	1 (4.17%)	0 (0%)	5 (20.83%)	24 (100%)
H26.9 Unspecified	1,421 (58.26%)	98 (4.02%)	143 (5.86%)	777 (31.86%)	2,439 (100%)

PE = Phacoemulsification, ECCE = Extracapsular cataract extraction, ICCE = Intracapsular cataract extraction

technique was 19,512, 18,310 and 17,555 baht, respectively. These values did not include out-patient cataract surgery which was more economical and commonly done in most hospitals. The average length of hospital stay was 2.35 days for senile cataract and 2.74 for other types of cataract.

Discussion

For the present study, we reviewed the number of out-patient visits and in-patient admissions for cataract in the Thai population as recorded (for reimbursement) by the three main health insurance schemes in Thailand. The numbers peaked for the 61-80 year-old age range. This agrees with other countries with increasingly older demographics^(2,3). Generally, there has been little apparent need to accurately classify cataract type or severity. In clinical practice, ophthalmologists have used anatomic (cortical, nuclear, posterior subcapsular) or etiologic (drug-induced, trauma) terms to describe the types of cataract. Subjective scales of severity have included terms such as immature, mature and hyper-mature cataract. As medical scientists began to study the risk factors and pathogenesis of cataract, a better system of cataract classification was needed. Several cataract classification systems have been developed including the Lens Opacification Classification System⁽⁵⁻⁷⁾, the Oxford Cataract Classification System⁽⁸⁾, the Wilmer System⁽⁹⁾ and the WHO-sponsored development of a Simplified Cataract Grading System⁽¹⁰⁾. The present study did not, however, use any of the above-mentioned classification systems, as the data retrieved from the summary discharge forms was already classified in the

terms used in the International Classification of Diseases (ICD-10).

Senile cataract is undoubtedly the most common type of cataract in the aging Thai population. This is also in accordance with the pattern of cataracts in other developed and developing countries worldwide^(1,2).

Traumatic cataract was the next most common type of cataract, perhaps due to blunt or penetrating eye injury (such as a metallic intraocular foreign body striking the lens). Most traumatic cataracts are preventable by wearing a pair of safety goggles.

Infantile, juvenile and pre-senile cataract ranked the third most common types of cataract and included both congenital cataract and cataract in the younger age group. Congenital cataract is usually associated with other organ anomalies. These associated anomalies almost invariably lower the chances of useful vision obtainable in this group of patients. Unfortunately, the authors could not differentiate the congenital type of cataract from the general grouping in order to identify the associated anomalies, which would be useful.

Complicated cataract is defined as cataract occurring secondary to intraocular diseases. A cataract may develop as a direct effect of intraocular disease on the physiology of the lens. Intraocular diseases commonly associated with the development of cataract include chronic uveitis, glaucoma, retinitis pigmentosa and retinal detachment. The authors could not, however, identify these intraocular diseases by the method employed in the present study.

Although drug-induced cataract is uncom-

mon, the 24 records uncovered in the present study suggests under-reporting. Since corticosteroids administered in various connective tissue diseases over a long period of time may result in posterior subcapsular cataract which is commonly seen in clinical practice, the number of drug-induced cataract should be much more than reported.

A Morgagnian cataract is a hyper-mature cataract in which the cortex liquefies and the mature central nucleus can be seen sinking down in the liquefied cortex. Phacoemulsification is less commonly used in this type of cataract. It may be attributed to the difficulty in doing capsulorhexis on a markedly thin capsule and milky white liquefied cortex in Morgagnian type. Phacoemulsification is also less commonly used in traumatic cataract. The reasons may be explained by the difficulty in management of a ruptured lens capsule by an intraocular foreign body striking the eye and/or traumatic dislocation of the lens.

Cataract surgery in Thailand is now under transition from an in-patient to an out-patient surgery. The average health expenditure of 18,527 baht and average length of hospital stay of 2.35 days did not include cataract surgery on an out-patient basis as is done in most hospitals now, for a reported average reimbursement rate of 7,000 baht. Day surgery lowers costs because there is no length of stay and simplified, less invasive surgical techniques are used. Moreover, manual, small-incision cataract surgery, without using a phaco-machine, as performed in some hospitals, further reduces costs and is regarded as the most cost-effective intervention⁽¹¹⁾. This finding agrees with previous reports on cost-effective cataract surgery⁽¹²⁻¹⁴⁾.

Limitations

The authors were unable to retrieve the out-patient data from the CSMB Scheme; therefore, the authors only had data for out-patient visits from the UC and SS schemes. The authors did, however, have complete in-patient data from all three national health insurance schemes and used these in the present analysis.

Another limitation was the retrospective nature of the present study. It was not possible to differentiate congenital cataract from the grouping of infantile, juvenile and pre-senile cataracts because the medical diagnosis and coding in the ICD-10 is the same for all of these (H26.0). Similarly, the associated organ anomalies in individual cases of congenital cataract could not be identified.

In cases of complicated cataract, the specific intraocular diseases associated with complicated cataract could not be identified because all these diseases use the same coding (H26.2). To improve the completeness of the data, a review of individual charts should be performed to minimize missing information. Alternatively, a prospective study should be designed to collect relevant data on specific diseases or topics of interest.

Conclusion

The authors reviewed the burden of cataract disease and its management in the Thai population for the fiscal year 2010. The results indicate that it is primarily a disease of the elderly, particularly among 61-80 year-olds. Senile cataract is the most common type of cataract and phacoemulsification with intraocular lens implantation the most common surgical procedure used to restore vision among the elderly. For economic reasons, all cataract surgeries should be done on an out-patient basis unless otherwise approved. Prospective studies should be designed and conducted to assess the relevant data on specific types of cataract and the associated risk factors.

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Potential conflicts of interest

None.

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การรักษาต้อกระจกในประเทศไทย

ยศอนันต์ ยศไพบูลย์, เกษม ยศไพบูลย์, ธนภัทร รัตนภากร, สุธาสินี สีนะวัฒน์, ธรรมศ สงวนศักดิ์, ชวกิจ ภูมิบุญชู

วัตถุประสงค์: วิเคราะห์ข้อมูลการรักษาต้อกระจกในประเทศไทยแยกตามชนิดของต้อกระจก วิธีการผ่าตัดรักษา ค่าใช้จ่ายในโรงพยาบาล และจำนวนวันนอนเฉลี่ย

วัสดุและวิธีการ: ศึกษาข้อมูลต้อกระจกทั้งของผู้ป่วยนอกและผู้ป่วยในโดยใช้ข้อมูลจากระบบประกันสุขภาพทั้ง 3 ระบบ ในปีงบประมาณ พ.ศ. 2553 วิเคราะห์ข้อมูลตามชนิดของต้อกระจก วิธีการผ่าตัดรักษา ค่าใช้จ่ายในโรงพยาบาล และจำนวนวันนอนเฉลี่ย

ผลการศึกษา: ข้อมูลต้อกระจกในผู้ป่วยนอก 654,352 ครั้ง และผู้ป่วยใน 146,994 ครั้ง จำนวนผู้ป่วยต้อกระจกมากที่สุดในกลุ่มอายุ 61-80 ปี ชนิดของต้อกระจกที่พบมากที่สุด คือ ต้อกระจกในผู้สูงอายุ (97.11%) รองลงมา ได้แก่ ต้อกระจกจากอุบัติเหตุ (0.59%) ต้อกระจกในคนอายุน้อย (0.45%) ต้อกระจกที่เกิดแทรกซ้อนจากโรคทางตา (0.15%) และต้อกระจกที่เกิดจากการใช้ยา (0.02%) การสลายต้อกระจกด้วยคลื่นความถี่สูง ร่วมกับการใส่เลนส์ตาเทียม เป็นวิธีการผ่าตัดรักษาต้อกระจกที่ใช้มากที่สุด (83.07%) ค่าใช้จ่ายในการรักษาในโรงพยาบาลเฉลี่ย 18,527 บาท และจำนวนวันนอนเฉลี่ย 2.35 วัน

สรุป: ผู้นิพนธ์ได้ศึกษาวิเคราะห์ข้อมูลการรักษาต้อกระจกในประเทศไทย ด้วยเหตุผลทางเศรษฐศาสตร์สาธารณสุข การรักษาต้อกระจกทั้งหมดควรเป็นการรักษาแบบผู้ป่วยนอก ยกเว้นกรณีที่มีข้อบ่งชี้อื่น การออกแบบวิจัยแบบศึกษาไปข้างหน้าจะช่วยให้สามารถเก็บข้อมูลที่สำคัญบางอย่าง ความผิดปกติของอวัยวะที่เกิดร่วม และปัจจัยเสี่ยงอื่นในต้อกระจกชนิดอื่นที่สนใจศึกษาต่อ