Demographic Characteristics and Comorbidity Profiles in Patients with Senile Cataract

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Original Research Article

ABSTRACT

Aims: The study was aimed to review demographic characteristics and comorbid systemic and ocular disorders in patients who underwent cataract surgery in our clinic.
Study Design: Retrospective cross-sectional
Place and Duration of Study: The study conducted in Department Of Ophthalmology, Ahi Evran University Faculty Of Medicine, Kırsehir, Turkey. The patients who underwent cataract surgery between November 2014 and December 2017 were evaluated retrospectively.
Methodology: We retrospectively reviewed 1197 patients diagnosed as cataract and underwent surgery. Age, gender, type of cataract, comorbid ocular disease, previous ocular surgeries and systemic diseases were recorded. By slit lamp examination with dilated pupils, cataract was classified as nuclear, cortical, posterior subcapsular, mixed and mature.
Results: Mean age was 67.87 ± 9.71 years (range: 45-95 years). Of the patients, 597 (49.9%) were female while 600 (50.1%) were male. The most common cataract type was nuclear cataract (27.2%); followed by posterior subcapsular cataract (24.7%), mixed cataract (23.1%), cortical cataract (14.9%) and mature cataract (10.0%). Hypertension was the most common systemic comorbidity (636 cases-46.9%), followed by diabetes mellitus (390 cases-32.6%). The most common ocular comorbidity was pseudo-exfoliation syndrome (121 cases-10.1%); followed by diabetic retinopathy of any stage (84 cases-7.0%).
Conclusion: Systemic and ocular comorbidities are commonly seen in the patients with senile cataract due to advanced age in these patients in general. All ocular and systemic comorbidities should be identified before surgery. These procedures will improve surgical success and prevents potential medico-legal issues after surgery.

Keywords: Cataract; surgery; ocular comorbidity; systemic comorbidity.

1. INTRODUCTION

At present time, the most common cause of treatable blindness is still cataract. WHO (World Health Organization) data indicates that 48% percent of blindness in the world is caused by cataracts, and it affects 18 million people. According to WHO estimates, by 2020, 54 million people over 60 years old will suffer decreased vision because of cataracts [1]. Due to the ageing population cataract will remain to be an important health issue in the future.

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Even race, high altitude, malnutrition, diabetes, corticosteroid use, long exposure to sunlight play role in the cataract progression, age is known to be the most important risk factor [2,3]. Systemic diseases and medication, other ocular diseases and previous ocular/extra-ocular surgeries accompanies to cataract in the elderly population. Therefore, pre-operative, peri-operative and post-operative treatment plan and rehabilitation is important.

It has been shown that comorbid diseases have influence on the surgical success. For instance, it is reported that patients who have unregulated arterial blood hypertension and who use anticoagulants have a higher risk of suprachoroidal haemorrhage and retinopathies of unregulated diabetic patients may worsen after the cataracts surgery [4,5].

In this study, we aimed to evaluate demographical features, comorbid systemic and ocular diseases and their relationship to cataract types in patients who underwent cataract surgery in our clinic.

1.1 MATERIALS AND METHODS

1197 patients who had cataract diagnosis and underwent cataract surgery in ophthalmology department of Ahi Evran University Medical Faculty between November 2014 and December 2017 were evaluated retrospectively. The age, gender, cataract type, other ocular diseases, previous ocular/extra-ocular surgeries and systemic diseases of the patients were recorded.

All the patients underwent full ophthalmologic examination. Cataract surgery was performed for the patients who had the best corrected visual acuity of 20/63 and less according to Snellen chart. Only the eye with less visual acuity before the surgery was included in the study. After the pupillary dilatation with mydriatic drops, cataract type was evaluated by slit lamp. The cataract classification was made by evaluating the anatomical location of opacification in the lens according to Brown and Hill [6] and Lens Opacities Classification System III [7] as nuclear, cortical, posterior subcapsular (PSC). Mixed and mature cataracts were also included in the study. The mixed cataracts were accepted as those have features of at least 2 of nuclear, cortical and PSC cataract types. Optical coherence tomography (software version 6.3.3.0, Heidelberg Engineering Inc, Heidelberg, Germany) and fundus fluorescein angiography (Canon Cx1 Retinal Camera, Canon Inc.Tokyo,Japan)were utilised for the cases when needed.

Congenital and secondary cataracts such as uveitic, traumatic, steroidal induced were excluded from the study. Before the surgery complete blood count, routine biochemistry parameters [fasting glucose, blood urea nitrogen, creatinine, AST, ALT, bilirubin, sodium, potassium ,calcium, LDL (low density lipoprotein cholesterol), HDL (high density lipoprotein cholesterol), triglyceride], prothrombin time (PTT) and activated partial thromboplastin time (aPTT), anti-HIV, anti-HCV, HbsAg tests were performed. Should the systemic diseases existed, patients were consulted with internal medicine, cardiology and pulmonology departments and patients were prepared pre-operatively according to their recommendations.

1.2 Statistical Analysis

For statistical analysis SPSS 20 (IBM Corp., Armonk, NY, USA) package software were used and $p<0.05$ was accepted as statistical significance. Descriptive statistics were used for demographical data. Normal distribution of the data was tested with Kolmogorov Smirnow test. The analysis of parametric data was performed by Kruskal-Wallis analysis and ANOVA test for the parametric data.

The approval of ethical committee in our faculty was obtained for the study.

2. RESULTS

The mean age of totally 1197 participants was 67.87 ± 9.71 (45-95) and there were 597 (49.9%) females and 600 (50.1%) males. The cataracts were in the right eye for 56.5% of cases and in the left eye for 43.4% of the cases. The most common cataract type was nuclear cataract (27.2%) followed by PSC (24.7%), mixed cataract (23.1%), cortical cataract (23.1%) and mature cataract (10%) respectively (Table 1).

The most common systemic disease accompanying cataract was arterial hypertension (AH), (636 patients - 46.9%) followed by diabetes mellitus (DM) (390 patients - 32.6%). The rate of at least one accompanying disease to cataracts in study population was 74.6% (Table 2).

268 (22%) patients had both DM and AH. The other accompanying systemic diseases were

cardiovascular diseases (14.6%), hyperlipidemia (10.4%), respiratory diseases (10.4%), prostatic diseases (6.1%), gastrointestinal system diseases (3.3%), thyroid diseases (1.8%), cerebrovascular diseases (1.4%), chronic renal failure (1.3%), extra-ocular malignancies (1.3%), psychiatric diseases (1.2%) and carotico-vertebral and cerebral artery occlusions (0.3%).

As contagious diseases Hepatitis B was found 3.2% of patients and hepatitis C was found as 0.1%. Some of these viral hepatitis patients (4 hepatitis B and 1hepatitis C patient) were diagnosed firstly in these routine laboratory testings (Table 3).

The most common ocular disease accompanying cataract was pseudo-exfoliation syndrome (PES) (121 patients-10.1%), followed by diabetic retinopathy of any stage (84 patients-7%). The other accompanying ocular diseases were pterygium (4.6%), glaucoma (4.4%), dry type age related macular degeneration (ARMD, 4.2%), dry eye (moderate, severe dry eye (3%, under cyclosporine treatment), wet-type ARMD (2.3%), idiopathic epiretinal membrane (2.3%), corneal opacities (1.7%), dacryocystitis (1%, previous DCR surgery), eyelid disorders like entropion and ectropion (0.8%), retinal artery and/or retinal vein occlusions (0.7%), high myopia (0.4%), retinitis pigmentosa (0.3%), optic atrophy 0.1% (Table 4).

3. DISCUSSION

The number of aging populating is increasing with increased average life-span. The rate of ophthalmic diseases seen in elderly is increasing, thus, life quality is affected by decreased vision. The surgical treatment of cataracts, which is the most common cause of decreased vision, improves life quality in elderly population and prevents possible morbidities [8,9].

The average age of senile cataract patients differ among the variable genetic, racial, geographic factors, sociocultural state, dietary habits and estimated life span. The average age of these patients was found as 64.5 years in Malesia [10], 74.9 years in Switzerland [11], 76.3 years in UK [12], 74.6 years in New Zeland [13] 65.9 years in China [14]. In central Turkey, Atas and et all [15] reported that mean age of cataract patients was 66.4 years. In our study, mean age was 67.8 years.

Table 1. Distribution of the patients according to cataract type

Cataract type	Number of patients (n)	Percent(%)	Age mean (years)
Nuclear	326	%27.2	68.88 ± 8.86
Cortical	178	%14.9	70.01 ± 9.5
PSC	296	%24.7	63.22 ± 9.73
Mature	120	%10	69.41 ± 11.02
Mixed	277	%23.1	69.65 ± 8.86

PSC: posterior subcapsular cataract

Table 2. Number the diseases accompanying cataract

Number of accompaniments	Number of patients (n)	Percent (%)
0	304	25.4
1	393	32.8
2	323	27
3	113	9.4
4	52	4.3
5	11	0.9
6	1	0.1

In our study, when patient systemic disease profiles revised, AH and DM were the most common diseases accompanying cataracts. Followed by the AH and DM, other common accompanying systemic conditions were cardiovascular disease (14.6%), hyperlipidemia (10.4%), respiratory system diseases (10.4%), prostate diseases (6.1%), respectively.

We found that the AH (49.6%) was the most common systemic disease accompanying cataracts. Previous studies reported that AH rates in cataract patients were 56.3% in Australia [16], %29 in a study including 18.545 patients in UK [12], 46.5% in the central region of Turkey. It's not clear whether AH or antihypertensive drugs causes cataracts. After modifying the results with factors like age and rate, it's shown that risk rate was lowered [17]. The high rate of AH in the study also indicates that it is an important public health issue in elderly population.

We found that DM (32.6%) was the second most common systemic disease accompanying

cataracts. The increased risk of cataract and age related cataract in younger ages in diabetic patient could be resulted from accumulation of sorbitol in the lens, accompanying hydration, non-enzymatic glycosylation of the lens proteins and increased oxidative stress in lens metabolism [18]. In addition to cataractous effect of diabetes, diabetes accelerates cataract formation. Diabetes mellitus was blamed to be an important and independent risk factor especially for the PSC [19]. The rate of DM in cataract patients was found as 40.6% in USA [20] and as 29.9% in Turkey [1].

With increasing rate, DM is an economical burden worldwide and one of the important public health issues. Thus, DM is defined as a pandemic condition. Obesity, sedentary life style and stress are blamed as the most important life-style factors in DM epidemia [21-23]. The progression rate of retinopathy after cataract surgery is more prompt in diabetic patients than natural course. Therefore, if the retina of the patients can be visualised, cataracts surgery should be postponed after the treatment of the retinopathy [5].

Table 3. Systemic diseases accompanying cataract

Concomitant systemic disease	Nuclear n(%)	Cortical n (%)	PSC n(%)	Mature n(%)	Mixed n(%)
DM	75(23)	54(30.3)	118(39.9)	41(34)	102(36.8)
AH	156(47.9)	96(53.9)	143(48.3)	70(58.3)	171(61.7)
Cardiovascular diseases	37(11.3)	23(12.9)	43(14.5)	17(14.2)	55(19.9)
Hyperlipidemia	29(8.9)	15(8.4)	41(13.9)	7(5.8)	32(11.6)
Rheumatologic disease	4(1.2)	2(1.1)	3(1.0)	1(0.8)	6(2.2)
Gastrointestinal system diseases	13(4)	4(2.2)	7(2.4)	6(5)	10(3.6)
Respiratory diseases	15(4.6)	14(7.9)	26(8.8)	8(6.7)	30(10.8)
Carotico-vertebral and cerebral artery occlusions	3(0.9)	-	1(0.3)	-	-
Prostatic diseases	16(4.9)	5(2.8)	19(6.4)	5(4.2)	28(10.1)
Psychiatric diseases	3(0.9)	2(1.1)	3(1)	3(2.5)	3(1.1)
Cerebrovascular diseases	5(1.5)	1(0.6)	3(1)	4(3.3)	4(1.4)
Thyroid diseases	6(1.8)	2(1.1)	6(2)	-	8(2.9)
Chronic renal failure	1(0.3)	6(3.4)	3(1)	-	5(1.8)
Extra-ocular malignancies	5(1.5)	1(0.6)	4(1.4)	2(1.7)	3(1.1)
Alzheimer	2(0.6)	2(1.1)	-	1(0.8)	1(0.4)
Parkinson's	-	-	-	1(0.8)	1(0.4)
Esansiyel trombositopeni	-	-	1(0.3)	-	-
Hepatititis B/C	10(3.1)	5(2.8)	12(4.1)	4(3.3)	8(2.9)

PSC: Posterior subcapsular cataract, DM: Diabetes mellitus, AH:Arterial hypertension

Table 4. Ocular diseases accompanying cataract

Ocular accompanying diseases	Nuclear n(%)	Cortical n(%)	PSC n(%)	Mature n(%)	Mixed n (%)
Dacryocystitis	2(0.6)	3(1.7)	2(0.7)	1(0.8)	4(1.4)
Corneal Opacities	7(2.1)	4(2.2)	3(1)	3(2.5)	3(1.1)
Pterygium	19 (5.8)	14(7.9)	9 (3)	2(1.7)	11(4)
Eyelid Disorders	1(0.3)	2(1.1)	1(0.3)	2(1.7)	3(1.1)
Dry Eye	13(4)	9(5.1)	3(1)	1(0.8)	10(3.6)
Glaucoma	23(7.1)	8(4.5)	7(2.4)	2(1.7)	13(4.7)
PES	29(8.9)	16(9)	19(6.4)	23(19.2)	34(12.3)
Dry Type ARMD	14(4.3)	14(7.3)	8(2.7)	1(0.8)	13(4.7)
Wet Type ARMD	12(3.7)	11(6.2)	2(0.7)		3(1.1)
Retinitis Pigmentosa			1(0.3)	1(0.8)	2(0.7)
Diabetic retinopathy of any stage	10(3.1)	25(14)	18(6.1)	5(4.2)	26(9.4)
Retinal Artery and/or Retinal vein occlusions	2(0.6)	1(0.6)		2(1.7)	3(1.1)
High myopia			2(0.7)		3(1.1)
Idiopathic epiretinal	6(1.8)	6(3.4)	5(1.7)		10(3.6)

membrane

PSC: posterior subcapsular cataract, PES: pseudo-exfoliation syndrome, ARMD: age related macular degeneration

In a study including 45.082 patients in USA, the rate of respiratory system diseases was 21.2%, malignancies was 12.5% and congestive heart disease was 9.5%. Riley and et al. [13] reported that following DM and AH, the most systemic conditions were cardiovascular, respiratory system, cerebrovascular and thyroid diseases respectively in New Zelland. We think that these diseases accompanying cataract are diseases of elderly population and there can be geographical differences according to genetic, racial and environmental factors.

In our study the most common ocular condition accompanying cataract was PES (10.1%). There are some challenges in cataract surgery for the eyes with PES. These cases has insufficient pupillary dilatation, increased capsular and zonular fragility in addition to higher glaucoma incidence and complication rates -including zonular dialysis, vitreous loss and intraocular lens decentralisation- are higher [24-25]. Previous studies from Turkey reported PES prevalence as 7-12% and these results coincide with our findings [26-28].

In our study, the second most common ocular disease accompanying cataract was diabetic retinopathy (7%). Besides, glaucoma rate was 4.4%, dry type ARMD rate was 4.2% and wet type ARMD rate was 2.3% in cataract patients. In UK [12] it was reported as 16.9% for ARMD, 11.2% for glaucoma and 3.4% for diabetic retinopathy. In New Zeland [13], ocular comorbidity was reported as 9.2% glaucoma, 7.6% diabetic retinopathy and 5.1% ARMD in cataract patients. In Australia [13]. ARMD rate was 12.6%, glaucoma rate was 10.6% and diabetic retinopathy rate was 9%.
Comparing to these studies, the lower rate of glaucoma and ARMD might be resulted from younger age in cataract patients in our study.

Pre-operative ocular comorbid diseases accompanying cataracts may influence postoperative visual outcome of the cataract surgery. Thus, with informing the patients about the prognosis of cataract surgery with informed consent, rational expectations of the patients can be ensured.

In the study, Hepatitis B rate was 3.2% and Hepatitis C rate was 0.1%. Some of these patients were firstly diagnosed with pre-operative routine testing. This indicates that preoperative serologic testing should be performed to prevent medico legal issues after the cataract surgery and to prevent transmission of the disease.

4. CONCLUSION

Senile cataracts are diseases of elderly people and comorbid systemic and ocular diseases may accompany to cataracts.The cataract patients should be evaluated for accompanying ocular and systemic diseases and not only for cataracts. To operate the patients in the appropriate time and condition, full ophthalmologic examination should be performed and patients should be consulted for systemic diseases. In conclusion we think that all the cataract patients should undergo full ophthalmologic examination and systemic evaluation before the surgery to get the best visual outcome and prevent systemic morbidity and mortalities.

ETHICAL APPROVAL

The study protocol was approved by the Ahi Evran University Faculty of Medicine Clinical Research Ethics Committee (Ethical approval number: 2018-05/50).

CONSENT

Thus, with informing the patients about the prognosis of cataract surgery with informed consent, rational expectations of the patients can be ensured.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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