Prevalence of Asymptomatic Fundus Lesions

Asemptomatik Fundus Lezyonlarının Prevalansı

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ABSTRACT

Purpose: To demonstrate fundus lesions affecting asymptomatic individuals for a group that includes subjects between 12 and 75 years of age who presented for a routine eye examination only based on refractive symptoms.

Materials and Methods: 1654 subjects who applied to our ophthalmology outpatient clinic with a purely refractive complaint without the knowledge of any preexisting ocular and systemic illness enrolled in the study. Fundus findings were noted and subjects were divided into 4 age strata including younger than age 20, between 21 and 40, between 41 and 60 and older than age 60. The distribution of fundus findings were analyzed according to these age groups.

Results: Asymptomatic fundus findings were detected in 84 patients (5.1%). The most common diagnosis was diabetic retinopathy. The prevalence of these conditions increased with increasing subject age. The percentage was 0.8% in subjects younger than 20 years and it was 11.2% in subjects older than 60 years.

Conclusions: We believe that our study support the significance of regular fundus examinations, especially in elderly patients. Therefore, a routine dilated fundus examination should be an integral part of the routine eye examination and it should be performed at specific time intervals in certain age groups in developing countries.

Key Words: Asymptomatic retinal conditions, diabetic retinopathy, dilated fundus examination, elderly patients, routine eye examination.

ÖZ

Amaç: Sadece refraktif semptomlara dayalı rutin bir göz muayenesi için başvuran, 12-75 yaşları arasındaki bireyleri içeren bir grupta, asemptomatik bireyleri etkileyen fundus lezyonlarını göstermek.

Gereç ve Yöntem: Önceden mevcut olduğu bilinen herhangi oküler ve sistemik hastalığı olmayan, tamamen refraktif bir yakınma ile polikliniğimize başvuran 1654 kişi bu çalışmaya dahil edildi. Fundus bulguları kaydedildi ve bireyler 20 yaş altı, 21 ve 40 yaş arası, 41 ve 60 yaş arası ve 60 yaş üstü olmak üzere dört yaş grubuna ayrıldı. Fundus bulgularının dağılımı bu yaş gruplarına göre analiz edildi.

Bulgular: Asemptomatik fundus bulguları 84 hastada (%5.1) tespit edildi. En sık görülen tanı diyabetik retinopati idi. Bu bulguların prevalansı, kişi yaşının artmasıyla artmış idi. 20 yaşın altındaki kişilerde bu oran %0.8, ve 60 yaşından daha büyük kişilerde ise %11.2 idi.

Sonuç: Çalışmamızın, özellikle yaşlı hastalarda, düzenli fundus muayenelerinin önemini desteklediğine inanıyoruz. Bu nedenle, rutin dilate fundus muayenesi, rutin göz muayenesinin ayrılmaz bir parçası olmalı ve gelişmekte olan ülkelerde belirli yaş gruplarında belirli zaman aralıklarında yapılmalıdır.

Anahtar Kelimeler: Asemptomatik retinal durumlar, diyabetik retinopati, fundus muayenesi, rutin göz muayenesi.

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INTRODUCTION

Routine dilated fundus examination (DFE) is considered by many ophthalmologists to be the standard of ophthalmic procedure. DFE may be considered to be "routine" when performed in the absence of any symptoms suggestive of acute retinal disease, such as vision loss, metamorphopsia, floaters and photopsia.[1] The presence of retinal lesions in the absence of any symptoms is called asymptomatic retinal conditions. The likelihood of retinal conditions was found to depend strongly on age.[2-6] There are no adequate studies on the frequency of asymptomatic retinal conditions. Some reports have showed that asymptomatic retinal conditions increase with age.[7,8] On the other hand, several studies have reported the significance of early detection and treatment of ocular conditions in the prevention of blindness. Thus, the literature emphasizes the importance of regular eye examinations, especially in elderly patients.[8-11] Moreover, the American Optometric Association (AOA) recommends that patients age 61 years or older, 41 to 60 years and 20 to 40 years undergo a DFE every year, every 2 years and every 3 years, respectively.[8,12]

The purpose of this study was to demonstrate fundus lesions affecting asymptomatic individuals for a group including subjects between 12 and 75 years of age who presented for a routine eye examination only based on refractive symptoms. The second aim was to determine the prevalence of asymptomatic fundus lesions in the Turkish community.

MATERIAL AND METHODS

This study conducted at the Bozyaka Training and Research Hospital between January 2015 and December 2015. This is a cross-sectional clinical study that includes 1654 patients. Patients who applied to our ophthalmology outpatient clinic with a purely refractive complaint without the knowledge of any preexisting ocular and systemic illness enrolled in the study. All individuals included in the study were > 12 years old and their demographic features were recorded. The study was conducted in accordance with the Tenets of the Declaration of Helsinki, with local ethical approval from the Ethics Committee of our hospital. All individuals underwent a detailed ophthalmic examination, including best-corrected visual acuity (BVCA) tests, anterior segment and posterior segment slit-lamp examination, intraocular pressure (IOP) measurement, fundus examination and color fundus photography. Fundus examinations including the peripheral retina were made of each eye under full pupillary dilatation using binocular indirect ophthalmoscope and the three mirror lens. All of the fundus photographs were recorded by the same physician (OK). Two retinal specialists (OK, MOZ), who were blinded to the data pertaining to the characteristics of the patients, individually graded the photographs. All equivocal lesions were discussed between the specialists. Retinal lesions were diagnosed on the basis of the morphologic changes observed, without indicating that they were secondary to other disorders. Patients likely to have suspicious retinal lesions subsequently underwent a fluorescein angiography and optical coherence tomography to confirm the diagnosis. Macular hole was classified by using noncontact-lens biomicroscopy and optical coherence tomography according to the Gass classification.[14] Age related macular degeneration (AMD) was also classified based on the 2013 consensus of the Beckman Initiative for Macular Research Classification Committee.[15]

Fundus findings of vitreous diseases (i.e., posterior vitreous detachment, asteroid hyalosis), retinal vascular diseases (i.e., diabetic retinopathy, branch retinal vein occlusion, hypertensive retinopathy), optic nerve diseases (i.e., papilledema, optic disc drusen and medullated nerve fiber), peripheral retinal diseases (i.e., peripheral retinal degeneration, retinal tear and hole), macular diseases (i.e., senil macular dejeneration, dystrophy, hole and epiretinal membrane) and uveal diseases (i.e., metastatic choroidal tumors, choroidal melanoma and nevus) were recorded and the patients were divided into 4 age strata including younger than age 20, between the ages of 21 and 40, between the ages of 41 and 60, and older than 60. The distribution of asymptomatic fundus findings were analyzed according to these age groups.

Exclusion criteria for subjects

1) Subjects with knowledge of any preexisting ocular illness (i.e., high myopia (greater than 6 diopters), glaucoma, ocular hypertension, uveitis, retinal vascular diseases, hereditary ocular diseases and acquired retinal diseases),
2) Subjects with a history of any ocular trauma or surgery,
3) Subjects with knowledge of any preexisting systemic illness (i.e., diabetes mellitus, systemic hypertension, cardiovascular disease, connective tissue disorders or any other coexisting systemic disease), and chronic drug use that might cause toxicity to the retina (i.e., Quinolines, tamoxifen, rosiglitazone, niacin, metronidazole, topiramate), were excluded from this study.

Statistical analyses

Statistics were analyzed using SPSS for Windows 17.0 software (SPSS Inc. Chicago, IL, USA). Categorical variables between groups were analyzed using the $\chi 2$ test. A p value < 0.05 was considered statistically significant.

RESULTS

Of the 1654 subjects, 924 (55.8%) were females and 730 (44.2%) were males. The mean age was 42.6 ± 7.3 years (range, 12–75 years). Asymptomatic retinal conditions

were detected in 84 patients (5.1%). Forty-three of patients (51.1%) were male, and the remaining 41 (48.9%) were female. The mean age of patients was 57.04 ± 8.6 years (range, 12–75 years). The prevalence of asymptomatic retinal lesions increased with increasing subject age in the younger than age 20, between 21 and 40, between 41 and 60 and older than 60 groups were 0.8%, 2.5%, 5.1% and 11.1%, respectively (p = 0.001). The detailed distribution of fundus lesions according to age and gender was given in Table 1.

The most common asymptomatic fundus finding was diabetic retinopathy without macular oedema. Other fundus findings were posterior vitreous detachment (PVD), AMD (dry type, early stage, Beckman Initiative for Macular Research Classification Committee[14]), peripheral retinal degeneration, asteroid hyalosis, branch retinal vein occlusion, retinal tear and hole, papilledema, medullated nerve fiber, macular hole (grade 1-2, Gass classification[13]), epiretinal membrane, choroidal nevus, optic disc drusen, malignant hypertension, macular dystrophy, metastatic choroidal tumors and choroidal melanoma. All retinal findings are detailed in Table 2.

DISCUSSION

Only few studies have investigated asymptomatic fundus lesions detected during routine eye examinations in the literature. To the best of our knowledge, the fundus lesions detected during routine eye examinations in the Turkish population and other developing countries have not been previously reported. In addition, unlike previous studies, in our study has been included pediatric population including subjects with younger than age 18. Therefore, we believe that our study reflects the entire population. Pollack and Brodie[7] reviewed the medical records of 1094 patients and noted the prevalence of retinal lesions. They detected retinal lesions in 53 of 1094 subjects (4.8%). They also reported that the prevalence of retinal lesions increased severely with increasing subject age, 0.8% younger than age 20 to 8.9% older than age 60. They indicated that the most common retinal lesion was macular drusen reported in 11 (1.0%) of 1094 subjects. Michaud and Forcier[11] also demonstrated the all prevalence of retinal lesions in a population from 19 to 64 years old who presented with only refractive symptoms. They found asymptomatic retinal conditions in 13.7% of patients and the most common retinal condition was peripheral retinal degeneration.

Previous studies have reported the significance of early detection and treatment of eye disease in prevention of blindness.[2-6,10] These studies have emphasized that diabetic retinopathy and senile macular degeneration are an important public health problem and the most important causes of blindness during adult working life. For instance, Rohan et al[10] reported that a quantitative assessment of the effect of screening showed that a programme in which patients with diabetes mellitus were referred to ophthalmologist for a fundus examination could detect 88% of overall diabetics with serious retinopathy and that 87% of these cases would be treatable. They also suggested that screening and early treatment of retinopathy would prevent deterioration of visual acuity and could reduce the risk of blindness due to diabetic retinopathy by an estimated 56%. The Turkish Diabetes Epidemiology Study (TURDEP) demonstrated that the crude prevalence of diabetes was 7.2%. They suggested that almost 2.6 million adults in Turkey might have diabetes, of whom 0.8 million might be unaware of their diseases.[15] We strongly believe that this data is an important finding especially for developing countries that cannot be carried out effectively early diagnosis and screening programs for the disease. However, Tas et al[16] demonstrated that the prevalence of diabetic retinopathy in Turkey was 9.8% at the time of diagnosis. We reported that the prevalence of diabetic retinopathy in asymptomatic subjects was 0.97%. The rate in patients with older than 50 years was 2.4%. Eldem et al[18] have reported the clinical and diagnostic characteristics of 945 consecutive patients with newly diagnosed diabetic macular edema (DME) (A Real-Life Registry Study-TURK-DEM). Although authors found that most patients (52.2%) with newly diagnosed DME applied to an ophthalmologist because of vision problems, 38.1% of the patients were detected during routine eye examination.

Currently, we cannot prevent the inception of these diseases. Early detection of these disorders by screening, furthermore, followed by appropriate intervention would prevent deterioration of visual acuity and could reduce the risk of blindness. In addition, early detection and treatment of some diseases such as ocular tumors may save the patient's life besides prevention of blindness.

Table 1. *Distribution of retinal findings according to age and gender*

Age (years)	No of patients	Asymptomatic retinal conditions (no of patients)		
		Male	Female	Total
12-20	366	1	2	3 (0.8%)
21-40	311	5	3	8 (2.5%)
41-60	600	14	17	31 (5.1%)
>60	377	23	19	42 (11.1%)

Table 2. *Asymptomatic fundus findings on routine DFE*

Asymptomatic fundus findings	No of patients
Vitreus diseases	
Posterior vitreous detachment (PVD)	13 (% 0.79)
Asteroid hyalosis	5 (% 0.30)
Retinal vascular diseases	
Diabetic retinopathy	16 (% 0.97)
Branch retinal vein occlusion	4 (% 0.24)
Malignant hypertension	2 (% 0.12)
Optic nerve diseases	
Papilledema	3 (% 0.18)
Optic disc drusen	2 (% 0.12)
Medullated nerve fiber	3 (% 0.18)
Peripheral retinal diseases	
Peripheral retinal degeneration	10 (% 0.60)
Retinal tear and hole	4 (% 0.24)
Macular diseases	
Senil macular dejeneration (dry type,early stage)	13 (% 0.79)
Macular dystrophy	1 (% 0.06)
Macular hole	2 (% 0.12)
Epiretinal membrane	2 (% 0.12)
Uveal diseases	
Metastatic choroidal tumors	1 (% 0.06)
Choroidal melanoma	1 (% 0.06)
Choroidal nevus	2 (% 0.12)

In conclusion, good visual acuity may not rule out the presence of eye disease. Therefore, we agree with the AOA's proposals for performing a routine DFE in developed countries. However, these proposals acceptable for developed countries are not very convenient for developing countries that patients registry system of hospital is not fully established. In our study, the incidence of asymptomatic retinal findings were higher older than 60 years. Therefore, this study and similar studies support the importance of regular eye examinations, especially in elderly patients. So, we feel that the frequency of DFE might be reconsidered in cases older than 40 years. We believe that this approach may minimized both the misdiagnosis of possible fundus pathology and medico-legal problems.

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REFERENCES/ KAYNAKLAR

1. Varner P. How frequently should asymptomatic patients be dilated? J Optom. 2014;7:57-61.
2. Parmet S, Lynm C, Glass RM. Age-related macular degeneration. JAMA 2006;295:2438.
3. Gottlieb JL. Age-related macular degeneration. JAMA 2002;288:2233-6.
4. Attebo K, Mitchell P, Smith W. Visual acuity and the causes of visual loss in Australia: The Blue Mountains eye study. Ophthalmology. 1996;103:357-64.
5. Klaver CC, Wolfs RC, Vingerling JR, Hofman A, de Jong PT. Age - specific prevalence and causes of blindness and visual impairment in an older population: The Rotterdam Study. Arch Ophthalmol. 1998;116:653-8.
6. VanNewkirk M, Weih L, McCarty CA, Taylor HR. Causes-specific prevalence of bilateral visual impairment in Victoria, Australia: The Visual Impairment Project. Ophthalmology. 2001;108:960-7.
7. Pollack AL, Brodie SE. Diagnostic yield of the routine dilated fundus examination. Ophthalmology. 1998;105:382-6.
8. American Optometric Association Consensus Panel on Comprehensive Adult Eye and Vision Examination. Comprehensive Adult Eye and Vision Examination. St Louis, MO: American Optometric Association, 1994.
9. Health Quality Ontario. Routine eye examinations for persons 20-64 years of age: An evidence-based analysis. Ont Health Technol Assess Ser. 2006;6:1-81.
10. Rohan TE, Frost CD, Wald NJ. Prevention of blindness by screening for diabetic retinopathy: A quantitative assessment. BMJ. 1989;11:98-201.
11. Michaud L, Forcier P. Prevalence of asymptomatic ocular conditions in subjects with refractive-based symptoms. J Optom. 2014;7:153-60.
12. Bullinore MA. Is routine dilation a waste of time? Optom Vis Sci. 1998;75:161-62.
13. J.D.M. Gass. Stereoscopic atlas of macular diseases: diagnosis and treatment (4th ed), St Louis: Mosby, 1997.
14. Ferris FL, Wilkinson CP, Bird A, Chakravarthy U, Chew E, Csaky K, et al; Beckman Initiative for Macular Research Classification Committee. Clinical classification of age-related macular degeneration. Ophthalmology. 2013;120:844-51.
15. Satman I, Yilmaz T, Sengul A, Salman S, Salman F, Uygur S, et al. Population-based study of diabetes and risk characteristics in Turkey: results of the Turkish diabetes epidemiology study (TURDEP). Diabetes Care. 2002;25:1551-6.
16. Tas A, Bayraktar M.Z, Erdem U, Sobacı G, Ucar M. Prevalence and risk factors for diabetic retinopathy in Turkey. Gulhane Med J. 2005;47:164-74.
17. Eldem B, Ozdek S, Saatci AO, Ozmert E, Ulay E, Nomak G. Clinical Characteristics of Patients with Newly Diagnosed Diabetic Macular Edema in Turkey: A Real-Life Registry Study-TURKDEM. J Ophthalmol. 2017;2017:3596817.