Demographic characteristics and incidence of ocular disease in patients at Shahid Rahnemoon Hospital (Yazd, Iran)

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Abstract

The type and frequency of diseases in a community represents genetic structure, nutritional status, social health standards, and the cultural traditions of the community. In addition, the different types of disorders that are common in an area are directly or indirectly under environmental effects. The epidemiological information of these disorders is important when developing health services programs and influences the way medical services are offered.

The aim of the present study was to determine the epidemiology and frequency of ocular diseases in patients referred to the Ophthalmic Clinic of Shahid Rahnemoon Hospital, Yazd, Iran. A cross sectional descriptive study was done by means of a questionnaire and statistical analysis on the data collected. A total number of 994 patients were surveyed and more than 70 types of disorders were diagnosed. The disorders were classified into 15 main groups. The most commonly detected conditions in the patients were refractive errors and conjunctival diseases (16.9% each), followed by disorders of the lens (12.7%), retinal diseases (11.9%), eye traumas (11.9%), eyelid disorders (7.3%) and glaucoma (5.2%). The majority of the patients were more than 40 years old. Regarding their education, most of them were illiterate. Most of the patients were housewives. Our results showed that the majority of the patients were living in urban areas. An association of diabetes and hypertension was seen more with retinal disease than with other conditions.

Keywords: Epidemiology, ocular diseases, medical services

Introduction

Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and thereafter the application of such information to the control of health problems¹. Because of the importance of epidemiological data, the World Health Organization (WHO) developed centers to gather reliable data in sixty countries. In ophthalmology, these data are used for planning reliable programs for prevention of blindness². In establishing these programs, early detection of high-risk patients and understanding the prevalence of diseases is a necessity. Although prevalence of some ophthalmic disorders such as conjunctival diseases, refractive errors, cataract, diabetic retinopathy, glaucoma and age related macular degeneration (ARMD) is reasonably well known in many areas of the world it has not been documented in Yazd province, (Iran), yet. Therefore, we decided to study common ophthalmic problems in this area to determine the relevant educational, therapeutic and health demands.

Materials and Methods

This descriptive cross sectional study was conducted as a descriptive cross sectional study on patients referred to the Eye Clinic of Shahid Rahnemoon Hospital during the first six months of 2003. The sampling method was in the format of a census and about 1000 patients were expected to participate according to previous information. A questionnaire was filled in for all patients after their eye examinations and interviews. Patients' details including sex, age, habitation, occupation, education, concurrent disease, referee type and diagnosis were recorded. Overall more than 70 diseases were diagnosed and recorded based on ICD10-CM coding and classification. All of the detected disorders were classified into 15 main groups and a miscellaneous group that contained less frequent diseases.

Results

During the study, a total number of 994 patients were evaluated. Regarding the patients' sex, 539 cases were male (54.2%) and 455 were female (45.8%). The most common causes for referral (see Table 1 and Figure 1) were: conjunctival diseases (16.9%), refractive errors (16.9%), lens problems (12.7%) retinal diseases (11.9%), trauma (11.9%), eyelid disease (7.3%)

and glaucoma (5.2%). A statistically significant correlation was seen between type of disease and sex. So the frequency of some diseases in the two sexes was different. The most common causes for admission in males was trauma (18.8%) followed by conjunctival diseases (18.7%), while less frequent was vitreous disease (0.7%). In females the most frequent complaint was refractive error (21.8%) and less frequently optic disc disorders (0.7%) as can be seen in Figure 2.

Regarding the patient ages, 48.7% of them were above 40 years old while only 14.4% of them were under 14 years old. In the age group under 14 years old, the most common complaints were conjunctival diseases (27.9%) and refractive error (20%) while the age group 15 to 24 years old, refractive error (32%) and conjunctival diseases (26.4%) were most frequent, and no cases of glaucoma, optic disc disease and vitreous disease were found. In the age group 25 to 39 years old, the most frequent cause for referral was trauma (24.2%) and finally in the patients over 40 years old, the prevalence of lens disease increased significantly



Figure 1. The ocular disease frequency based on main group disorders.

Disease



(47.5%). Amblyopia was detected only in 10.5% of the patients in the age group under 14 years old and in 1.1% of the age group 15 to 24 years old, but there were no cases in other age groups. Most cases of refractive error were in age group 15 to 24 years old (32%).

Regarding the patients' education, 38 patients were under 7 years old and the others were classified into five groups of: illiterate, primary school, secondary school, high school and university educated. Approximately 54% of patients were illiterate or had primary school education. The most common disease in these two groups was lens diseases (29.5%) and then retinal diseases (20.9%). In the patients with secondary school education and higher, refractive error (22.6%) and conjunctival disease (21.5%) were the most frequent complaints.

Of the 994 cases, 151 were under 15 years old. The other 843 cases were classified into the following occupational groups: 1-Farmer and worker; 2-Official staff; 3-Self employee; 4-House keeper; 5-Student and soldier; 6-Retired and unemployed. The majority of patients were house keepers

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(group 4) (32%) followed by the farmers and workers (22%). Students and soldiers were the least referred group (9.7%). In farmer and workers group, trauma (23.8%) and conjunctival diseases (17.3%) were the most frequent ocular diseases

 Table 1. The ocular disease frequency based on main group disorders.

Diseases group	Number	Percent
Conjunctiva disease	168	16.9
Refractive error	168	16.9
Lens disease	127	12.7
Retinal disease	119	11.9
Trauma	119	11.9
Eyelid disease	73	7.3
Glaucoma	52	5.2
Cornea	35	3.5
Uvea and sclera	26	2.6
Lacrimal system	25	2.5
Strabismus and	23	2.3
nystagmus		
Amblyopia	17	1.7
Orbital disease	15	1.5
Optic nerve	12	1.2
Vitreous and aqueous	12	1.2
Miscellaneous	3	0.3



Figure 2. The ocular disease frequency based on the sex.



while in the retired and house keeper groups lens diseases were most frequent (20.4%). Most glaucoma patients (9.8%) were among the unemployed and retired patients. Most of the patients (68.7%) were living in urban areas while 31.3% of them were living in rural areas. No significant relationship was found between eye diseases and habitation locality. The most frequent cause of referral in urban patients was conjunctival disease, while in rural patients refractive error and lens disease were more common. Frequency of lens disease in rural patients (17.7%) was higher than urban patients (10.5%) while the frequency of trauma was lower in rural patients (8.2% versus 13.8%).

In total 17.5% of the patients had diabetes. 71.4% of the patients with retinal disease, 32.3% with lens diseases and 28.8% of the patients with glaucoma had diabetes. Hypertension was found in 12.6% of patients and was more associated with retinal diseases (32% of retinal disease patients had hypertension).

In this study 22.9% of patients were referred by general practitioners while others came to the clinic by themselves.

Discussion

Knowledge of disease epidemiology is an essential prerequisite for prevention and control of diseases. Although frequent studies have been done in other countries to evaluate the prevalence of common eye diseases, limited studies have been done in Iran for this purpose.

Prevalence of diseases is varying under the effect of predisposing factors. Etiological factors in disease can be divided into genetic and environmental factors. Increased environmental allergens, ozone layer changes, increased ultraviolet irradiation, nutritional habits, occupational accidents and interracial mixtures are among the factors that can change the epidemiology of diseases.

Conjunctivitis is the most frequent eye disease in the world². This study indicated that conjunctival diseases (16.9%) and refractive errors (16.9%) occurred most frequently. Allergic conjunctivitis was the most common complaint that was seen in males (58.3%) more than in females (41.6%). In the by Bagheri and Zare³ study, conjunctivitis was more frequent in males (67.1%) and most of them were referred during spring and summer. In the

Mirjalili study⁴, 14.4% of their patients had conjunctivitis but no significant difference was found in the frequency of this disease between males and females. Both of these studies were conducted in Iran. In addition, studies in other countries have shown that conjunctival disease especially allergic types are one of the main ophthalmic problems⁵. In one study, symptoms of vernal catarrh were seen in 21% of British people⁵. A survey in Italy showed that 38% of people have had allergic conjunctivitis with the manifestation of rhino-conjunctivitis (63.7%), atopic conjunctivitis (21%) and vernal conjunctivitis⁵. What is important in allergic diseases is their high incidence not their severity. One of the most important eye diseases that may be associated with allergic rhinitis is vernal catarrh⁶. Signs and symptoms of allergic conjunctivitis includes red eye, foreign body sensation, photophobia, burning, itching, blurring of vision and dry eye⁷. Symptoms of conjunctivitis are more severe in men than women. This possibly could be due to more outdoors activities and therefore exposure to allergens in men³.

The other types of conjunctival disorders are pterygiums, which are an irritating phenomenon due to ultraviolet radiation, dry and dusty air¹. In different studies² frequencies were between 0.13 to 7% while its frequency was 2.4%. In this study the warm and dry climate of Yazd, located near the central desert of Iran was the reason for the high frequency.

Another common disease in the study was refractive error (16.9%) that was more frequent in women than men. The frequency of refractive error was 14.8% in the study⁴ by Mirjalili with more prevalence in women (52.6%). In a survey by Crawford and Hamer⁸ in Hawaii, the effect of nationality and race on the frequency of refractive error was studied and they found that in 17% of Chinese, 13% of Korean, 12% of Japanese, 12% of Caucasian, 9% of Hispanics and 7% of Portuguese. These results confirm that refractive error is influenced by genetic factors.

In this study, lens diseases were observed in 12.7% of patients and were more frequent in women and the patients above 60 years old. The most significant disease of this group was cataract. In the Bagheri and Zare⁹ study, 52.8% of patients with cataract were women and 75% of them were



between 60-80 years old. Also, 54.4% of cataract patients were women in the study by Mirjalili⁴. Multiple studies have been done about cataract risk factors which indicate that the most important factor is the age¹⁰. The other risk factors include; ultraviolet B, diabetes, female gender, myopia, oral beta blockers, steroids, hypertension, nicotine, alcohol, dehydration and diarrhea¹⁰⁻¹². McCarty et al^{11} indicated that prevalence of cortical cataract was 11.3%, nuclear cataract was 12.6% and posterior sub-capsular cataract was 4.9% in Australia. Overall, cataract is the most important worldwide cause of blindness, including more than half of cases^{13, 14}. For example, there are 22 million cases of blindness in India and cataract responsible for 80% of them¹⁵. Morphologic varieties of senile cataract have different biochemical specifications¹⁶. Most of the cortical and sub-capsular cataracts are affected by environmental factors such as ultraviolet radiation, diabetes and drugs¹⁷. Again, multiple studies show that cortical and nuclear cataract are more prevalent than the sub-capsular types¹⁸. Supplemental vitamins especially antioxidants (A, C and E) have significant roles in decreasing cortical and nuclear cataract frequency^{19, 20} while cigarette smoking increased cataract and ARMD prevalences²¹. In our study cataract was accompanied with diabetes in 32.2% of the cases. The other studies indicate a 3-4 times increase in cataract prevalence among diabetics²².

Retinal diseases were detected in 11.9% of the patients in this study. The prevalence of retinal diseases, in the Mirjalili study,⁴ was lower than in our study (5% versus 11.9%). The most important disorder of retinal diseases was diabetic retinopathy. The frequency of diabetic retinopathy increases with increasing age and duration of disease. In our study most of the diabetic patients were above 40 years old and one of the most important retinopathy risk factors was duration of diabetes. It was shown that prevalence of retinopathy in diabetic patients after 3 years is 8% while after 5, 10 and 15 years this prevalence was 25%, 60% and 80% respectively²³.

Similar to the retinal diseases, the frequency of trauma was 11.9% among our patients. Previous studies have shown that 5% of ophthalmic disorders are because of trauma and it happens before 25 years of age²² in more than half of cases. Most cases of trauma in this study occurred in the 25-39 years

old group and then in the 15-24 years old group. Prevalence of eye trauma in men (18.8%) was significantly more than women (4%) in our study. Similarly, in an epidemiological study of eye trauma by Farvardin and Mahdizadeh²⁴, trauma occurred in men three times more than in women. They showed that most injuries occurred in spring. Also they showed that the most important risk factor of eye trauma was occupation and sport injuries.

It is estimated, in year 2000, that approximately 67 million cases had glaucoma in the world²⁵. In our study 5.2% of the patients had glaucoma. Unfortunately there is no precise and complete study about prevalence and incidence of glaucoma in Iran. Lai et al26 showed that the incidence of glaucoma among Hong Kong Chinese population was 10.4 cases per 100.000 per year. They showed that the most important risk factor for glaucoma was ageing and positive family history, respiratory infection and antitussive drugs. A survey in Italy shows that 25% of glaucoma cases are angle closure predominantly the chronic type²⁷. In this study the frequency of glaucoma was 5.8% in the 40-59 years age group and 12.8% in the cases above 60 years old. Also 28.8% of glaucoma patients were among diabetic patients.

In our study the frequency of amblyopia in the less than 14 years age group was 10.5%, of them 58.8% were females and 41.2% were males. In the study by Javadi and Ahmadi²⁸ the frequency of amblyopia was 6.6% which 52% of them were females. In the United States prevalence of amblyopia has been estimated² to be 2-2.5%.

This study showed that among the referred patients to the Eye Clinic, refractive error conjunctival disorders, trauma, diabetic retinopathy and amblyopia were the most frequent causes of referral. These disorders are major causes of visual loss that are preventable with rational and precise health programs.

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