Original Article

PREVALENCE OF EYE DISEASES AND VISUAL IMPAIRMENT IN URBAN POPULATION – A STUDY FROM UNIVERSITY OF MALAYA MEDICAL CENTRE

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ABSTRACT

One thousand one hundred and sixty-nine (1169) patients were examined in the Eye Clinic of University of Malaya Medical Centre over a period of three weeks to determine the prevalence of eye diseases and visual impairment. Age, gender, race, visual acuity and diagnosis of patients were noted from the case records. Cataract (385, 32.9%) was the most common eye disease seen in our study followed by glaucoma (274, 23.4%). Refractive errors were seen in 126 (10.8%) while diabetic retinopathy was noted in 113 (9.7%) patients. One hundred and fifteen (9.6%) patients had visual impairment and 11 (0.9%) had blindness in our study according to WHO classification of visual impairment. Refractive errors are the most common causes of visual impairment in children, while cataract, glaucoma and diabetic retinopathy account for visual impairment in elderly people. All these eye diseases are treatable and the severe eye conditions may be potentially preventable with early diagnosis.

Keywords: Eye diseases, visual impairment, cataract, glaucoma, corneal diseases, diabetic retinopathy.

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INTRODUCTION

Diseases that cause visual impairment are known to significantly alter the quality of life of the individual through the prolonged period of morbidity. The geographical, economic, social and political aspects of the susceptible population, environmental hazards and trauma have been established as the main causative factors for eye disorders. Within the population, several factors such as age and gender also modify the prevalence of the eye disorders.

In the National Eye Survey Malaysia conducted in 1996,[1] the prevalence of visual impairment in Malaysia was found to be 2.7% which was higher in rural areas (2.9%) than in urban areas (2.5%).[1] Prevalence of visual impairment in rural population in Selangor state has been reported to be varying from 5.6% [2] to 18.9% [3]. However, there is no data available on the prevalence of visual impairment in urban population from any State or University hospitals in Malaysia. Therefore, this study was undertaken to determine the prevalence of eye diseases and visual impairment among the patients attending the Eye Clinic of University of Malaya Medical Center, which provides medical care facilities to mostly urban population in Kuala Lumpur Federal Territory and Klang Valley. This work

was conducted as a research project of Phase II medical students as part of their medical training.

METHODS

The medical records of all patients attending the Eye Clinic of University of Malaya Medical Center were reviewed from 19 May 2003 to 8 June 2003. In the morning from 8 a.m. to 1 p.m., new cases and follow-up patients were seen in the eye clinic. Patients with acute eye problems (pain, redness, injury, sudden loss of vision) were seen on the same day of referral to the clinic. The afternoon clinic (2 to 5 p.m.) was allocated for cataract patients called for investigations and review, patients from other wards referred for eye checkup and patients listed for laser photocoagulation. All these patients were included in this study.

Data obtained from their medical records included age, gender, race, visual acuity and ophthalmologic diagnosis and associated systemic diseases. Visual acuity was measured using a Snellen chart by trained auxiliary staff and all patients were then examined by the ophthalmologists. Patients with retinal diseases were examined after dilating pupils with

tropicamide eye drops. Refraction was done by the qualified optometrist of the hospital. Visual acuity in young children and mentally retarded patients was tested whenever possible and in some instances, the visual acuity could not be recorded. When more than one eye disease were present in a patient, they were listed under the relevant subheading as per international statistical classification of diseases[4] – eyelids, lacrimal system, conjunctiva, cornea, sclera, uveal tract, lens, vitreous body, retina, glaucoma, optic nerve and visual pathway, orbit, strabismus, trauma to the eye, refractive error or visual disturbance. However, the percentage of prevalence of the eye diseases was calculated based on the total number of patients examined only. The findings were entered in a data sheet and analysed using SPSS software.

Taking the best corrected vision in the better eye into account, the visual impairment was categorised into four groups[4] – no visual impairment (visual acuity 6/6–6/18), visual impairment (visual acuity < 6/18 – 6/60), severe visual impairment (visual acuity < 6/60 – 3/60) and blindness (visual acuity < 3/60 – no perception to light).

RESULTS

A total of 1169 patients' records were reviewed during the study period; 184 (15.7%) were new cases and the rest 985 (84.3%) were follow-up patients. More than half of the patients (601, 51.4%) were females and 568 (48.6%) were males; the mean age of patients was 51.1 ± 20.6 years (range 3 months to 90 years); 724 (61.9%) of patients were aged above 50 years; 109 (9.3%) were children below 12 years of age (Table 1). In this study, 452 were Chinese (38.7%), 367 Malays (31.4%), 328 Indians (28.1%) and the rest 22 (1.9%) were of other races (10 Punjabis, 7 Indonesians and 5 Bangladeshis).

Table 1. Age and gender distribution of patients

Age	Males	Females	Total (%)
1 month – 10 years	40	36	76 (6.5)
11 – 20 years	38	35	73 (6.2)
21 – 30 years	24	45	69 (5.9)
31 – 40 years	39	23	62 (5.3)
41 – 50 years	78	87	165 (14.1)
51 – 60 years	116	142	258 (22.1)
61 – 70 years	148	158	306 (26.2)
71 – 80 years	79	71	150 (12.8)
81 – 90 years	6	4	10 (0.8)
Total	568	601	1169

The prevalence of different eye diseases is shown in Table 2. Some of the patients had more than one eye disease. Hence, the total number in the table will be more than the number of patients examined. Cataract, un-operated and operated cases together (385, 32.9%), was the most common eye disease seen in our study followed by glaucoma (274, 23.4%). Among the 385 cataract patients, 229 were men (59.5%) and 156 were women (40.5%); the mean age of patients was 63.10 ± 13.21 years (range 6-87 years).Diabetes was present in 112 (29.1%), hypertension in 72 (18.7%), and ischemic heart diseases in 24 (6.2%) patients with cataract.

Among the 274 glaucoma patients, 144 were women (52.6%) and 130 were men (47.5%); the mean age of patients were 61.5 ± 15.4 years (range 7-90 years). Diabetes was present in 104 (38.0%), hypertension in 70 (25.5%) and ischaemic heart disease in 21 (7.7%) patients with glaucoma.

The other common eye diseases observed in this study were refractive errors (126, 10.8%) and diabetic retinopathy (113, 9.7%). Visual impairment was noted in 96 (8.2%) patients while another 19 (1.6%) had severe visual impairment (total 9.8%). In 35 young children visual acuity could not be tested (Table 3).

DISCUSSION

The clinic and hospital based surveys do not represent the true frequency of eye diseases seen in the community. There may be many more patients with cataract and glaucoma who may not have overt eye symptoms, hence do not present to the hospital. However, in the absence of data on frequency of various eye diseases, our study may give some information on the prevalence of eye diseases in an urban population in Malaysia.

The prevalence of visual impairment in our study was similar to that reported by Herse and Gothwal[5] from India (Table 4), whose study was based over a 3 months period. Even though their study was based in an eye hospital and our study was based in a teaching hospital, the number of patients seen is nearly same compared to the time period of study.

In a study of 159 rural population in Selangor, Reddy *et al*[8] reported the prevalence of cataract as 20.1%, glaucoma as 4.4% and diabetic retinopathy as 1.3%. A much higher prevalence of the same diseases in urban population in our study was found to be as 32.9%, 23.4% and 9.6% respectively. Probably such high figures could be because the study was done in a referral centre.

The prevalence of dry eye (after doing thorough investigations) in eye clinic patients from the same hospital was reported to be 14.5% by Jamaliah *et al.*[6] The higher number of proliferative diabetic retinopathy cases in our study is because all the patients who were scheduled for panretinal photocoagulation patients in the afternoon hours of the clinic were included in

Table 2. Prevalence of eye diseases in study population (n=1169)

EYE DISEASES	NO. (%)	EYE DISEASES	NO. (%)
Eye lids	11 (0.9)	**Vitreous**	
Blepheritis	8 (0.7)	Vitreous degeneration	24 (2.1)
Stye	6 (0.5)	Vitreous haemorrhage	4 (0.3)
Chalazion	4 (0.3)	Vitreous detachment	2 (0.2)
Ptosis	4 (0.3)	**Retina**	
Entropion	3 (0.3)	PDR	53 (4.5)
Ectropion	2 (0.2)	BDR	48 (4.1)
Lacrimal system		Diabetic maculopathy	12 (1.0)
Dry eyes	38 (3.3)	Retinal degenerations	10 (0.9)
NLD obstruction	20 (1.7)	Retinal detachment	7 (0.6)
Conjunctiva		CRVO	3 (0.3)
Bacterial conjunctivitis	15 (1.3)	Macular hole	2 (0.2)
Viral conjunctivitis	35 (3.0)	Macular oedema	3 (0.3)
Allergic conjunctivitis	18 (1.5)	**Glaucoma**	
Follicular conjunctivitis	2 (0.2)	Open angle glaucoma	139 (11.9)
Pterygium	19 (1.6)	Narrow angle glaucoma	58 (5.0)
Pinguicula	5 (0.4)	Normotensive glaucoma	20 (1.7)
Subconjuct.haemorrhage	3 (0.3)	Glaucoma suspect	45 (3.8)
Sclera	2 (0.2)	Secondary glaucoma	9 (0.8)
Episcleritis	1 (0.1)	Congenital glaucoma	3 (0.3)
Scleritis	1 (0.1)	**Optic nerve & visual pathway**	
Melanosis sclera	1 (0.1)	Optic atrophy	5 (0.4)
Cornea		Optic neuritis	2 (0.2)
Nummular keratitis	19 (1.6)	Bitemporal hemianopia	4 (0.3)
Punctuate keratitis	9 (0.8)	**Orbit**	
Bacterial keratitis	6 (0.5)	Orbital cellulitis	1 (0.1)
Viral keratitis	4 (0.3)	Proptosis	1 (0.1)
Corneal abrasion	11 (0.9)	Periorbital haematoma	1 (0.1)
Corneal opacity	9 (0.8)	**Strabismus**	
Keratoconus	4 (0.3)	Esotropia	22 (1.9)
Bullous keratopathy	4 (0.3)	Exotropia	12 (1.0)
Uveal tract		**Trauma to eye**	
Anterior uveitis	7 (0.6)	Foreign body cornea	18 (1.5)
Pan uveitis	3 (0.3)	Chemical injury	3 (0.3)
Posterior uveitis	1 (0.1)	Perforating injury cornea	5 (0.4)
Lens		**Refractive errors**	
Senile cataract	127 (10.9)	Myopia	47 (4.0)
Traumatic cataract	5 (0.4)	Presbyopia	64 (5.5)
Congenital cataract	2 (0.2)	Hypermetropia	10 (0.9)
ECCE+PCIOL	156 (13.3)	Astigmatism	5 (0.4)
ECCE+ACIOL	20 (1.7)		
Phaco+PCIOL	59 (5.0)		
Phaco+ACIOL	8 (0.7)		
Aphakia	8 (0.7)		

NLD = nasolacrimal duct, ECCE= extracapsular cataract extraction, PCIOL= posterior chamber intraocular lens implantation, ACIOL= anterior chamber intraocular lens implantation, PDR= proliferative diabetic retinopathy, BDR= background diabetic retinopathy, CRVO= central retinal vein occlusion

Table 3. Best corrected visual acuity in the better eye (as per WHO categorization of vision) among the study population (N=1169)

Visual impairment category	Visual acuity	Number (%)
No visual impairment	6/6 – 6/18	1008 (86.2)
Visual impairment	< 6/18 – 6/60	96 (8.2)
Severe visual impairment	< 6/60 – 3/60	19 (1.6)
Blindness	< 3/60 – NPL	11 (0.9)
Undetermined*		35 (3.0)

*these patients were many children with mental retardation, Down syndrome, and few adolescents with psychiatric disorders. NPL: no perception of light.

Table 4. Comparison of visual impairment and blindness (based on visual acuity) in tertiary eye care centers in Malaysia and in India.

Vision categorization	Malaysia* (n=1169)	India (n=4122)
No impairment	86.2%	86.6%
Visual impairment	8.2%	9.5%
Severe visual impairment	1.6%	1.3%
Blindness	0.9%	2.6%

* In 3% of study population vision could not be tested.

our study. The prevalence of proliferative diabetic retinopathy among the diabetic patients attending the eye clinic of the same hospital was reported to be 28.1% by Tajunisah *et al.*[7]

Limitations of study

The number of patients in our study was too small to give accurate prevalence rate of different eye diseases in urban population in Malaysia. This study includes both new and follow-up cases, hence chronic eye diseases are over-represented compared to acute diseases. The prevalence of some diseases that occur on a seasonal basis like viral conjunctivitis may not be accurately represented in the study because of the rather short period of the study. The aetiological diagnosis of corneal ulcer was based on clinical signs of the diseases and routine culture and sensitivity test was not available in all the case records. The patients attending the eye clinic do not represent the whole population in the society because some people who have eye diseases might have attended other eye clinics in the city of Kuala Lumpur.

CONCLUSIONS

In general, refractive errors are the most common causes of visual impairment in children; while cataract, glaucoma and diabetic retinopathy account for visual impairment in elderly people. By providing free/ affordable eye care facilities and eye care health education in Ministry of Health / University hospitals; and by more active participation of primary care doctors in preventive eye care the prevalence of visual impairment/ blindness can be reduced to a great extent in Malaysia.

REFERENCES

1. National Eye Survey (1996). Visual impairment in Malaysia. Malaysia's Health report, technical report of the Director General of Health Malaysia, Ministry of Health Malaysia; 1999: 243-9
2. Zainal M, Masrah L, Ropilah AR. Blindness and visual impairment among rural Malays in Kuala Selangor, Selangor. *Med J Malaysia.* 1998;53(1):46-50
3. Reddy SC, Rampal L, Nurulaini O. Prevalence and causes of visual impairment and blindness in a rural population in Sepang district, Selangor. *Med J Malaysia.* 2004;59(2):212-7
4. World Health Organization (WHO). International statistical classification of diseases and health related problems. Volume 1, Tenth revision, Geneva, 1992, pp. 429-459, 898-899, 956, 963
5. Herse P, Gothwal VK. Survey of visual impairment in an Indian tertiary eye hospital. *Indian J Ophthalmol.* 1997;45(3):189-93
6. Jamaliah R, Fathilah J.   Prevalence of dry eye in University of Malaya Medical Centre. *Med J Malaysia.* 2002;57(4):390-7
7. Tajunisah I, Nabilah H, Reddy SC. Prevalence and risk factors for diabetic retinopathy a study of 217 patients from University of Malaya Medical Centre. *Med J Malaysia.* 2006;61(4):451-6