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Original Article

PREVALENCE OF EYE DISEASES AND VISUAL IMPAIRMENT AMONG THE RURAL POPULATION – A CASE STUDY OF TEMERLOH HOSPITAL

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ABSTRACT
Objective: To determine the prevalence of eye diseases and visual impairment among new patients at the eye clinic of Hospital Sultan Haji Ahmad Shah, Temerloh, Pahang.
Method: In this cross-sectional prospective study, 1081 new patients were examined over a period of six months. Age, gender, ethnicity, visual acuity and diagnosis were noted from the medical records.
Results: Out of 1081 examined, 607 (56.1%) were males, 783 (72.4%) were Malays. The mean age of patients was 45.2 years (ranging from one month to 91 years). Cataract (248, 22.9%) was the most common eye disease, followed by retinal diseases (124, 11.5%) and ocular trauma (106, 9.8%). Majority of the patients (48) suffering from ocular trauma had foreign body cornea. In 85 premature infants screened for retinopathy, 19 showed different stages of retinopathy of prematurity. Visual impairment was noted in 89 (8.2%) patients, severe visual impairment in 12 (1.1%) and blindness in 35 (3.2%); vision could not be determined in 85 premature infants (7.9%). Cataract was singled out as the cause of severe visual impairment in 11 out of 12 patients.
Conclusion: Health education at primary health centres and availability of eye specialists in all the district hospitals will facilitate the rehabilitation of visually impaired and blind persons by providing early treatment for eye problems (specifically prescription for spectacles, medical treatment and cataract surgery with intraocular lens implantation).
Keywords: Visual impairment, cataract, diabetic retinopathy, glaucoma, refractive errors, ocular trauma, conjunctivitis.
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INTRODUCTION

Eye diseases are known to adversely affect quality of life. Geographical location, accessibility to facilities and socio-economic status of an individual play a role in occurrence eye diseases. According to international classification of diseases established by the World Health organisation (WHO),[1] the vision of patients (best corrected visual acuity in the better eye) was categorised into: no visual impairment (6/6-6/18), visual impairment (<6/18-6/60), severe visual impairment (6/60-3/60), and blindness (<3/60-no perception of light).

The 1996 National Eye Survey Malaysia[2] showed the national prevalence of visual impairment as 2.7%, more in rural areas (2.9%) than in urban areas (2.5%). Since visual impairment in urban population was statistically higher, we reviewed the literature for relevant data. We discovered that there were 8.2% visually impaired patients seeking treatment at an eye clinic (University Malaya Medical Centre) in Kuala Lumpur and majority of them were from urban areas in Kuala Lumpur.[3] In Kuala Selangor, district located in Selangor, 5.6% of its rural populations was reported to be visually impaired while[4] the statistics from Sepang district stood at 18.9%.[5]

However, no data was available for other government/private hospitals in Malaysia. Hence, this study was undertaken to determine prevalence of eye diseases and visual impairment among new patients (first time attending) at the Hospital Sultan Haji Ahmad Shah, formerly known as Hospital Temerloh. This is a government multi-speciality hospital located in the district of Temerloh in Pahang. The hospital provides medical services for the population of Temerloh, Maran, Jerantut, Raub, Bentong, Bera and Kuala Lipis.[6] Hospital Kuantan is another government hospital providing eye care services in Pahang.

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MATERIAL AND METHODS

This is a cross-sectional study conducted in Hospital Sultan Haji Ahmad Shah, Temerloh. New patients at the eye clinic were observed over a period of six months (April 2010 to September 2010). However, patients on follow-up visits have been excluded from the study. Age, gender, race, visual acuity and ocular diagnosis were noted from the patients' medical records.

Trained paramedics used Snellen chart to test visual acuity. Patients were examined with the slit lamp and intraocular pressure was measured with Goldman Applanation Tonometre or Tonopen. Pupils were dilated with 1% tropicamide eye drops and the fundus examined using 90D lens with slit lamp or 20D lens with binocular indirect ophthalmoscope.

Eye diseases were categorised according to internationally recognised statistical classification of diseases such as diseases of eyelids, lacrimal system, conjunctiva, epislcera and sclera, cornea, uveal tract, lens vireous, glaucoma, retina, optic nerve and visual pathway, orbit, strabismus, trauma to the eye, and refractive errors.[1] Patients with vision 6/9 or worse were subjected to refraction and visual improvement using spectacles was noted. Based on the final visual acuity, patients were grouped into WHO categories of visual impairment. The findings were analysed using SPSS software.

RESULTS

A total of 1081 patients were registered and examined. There were more males (607, 56.1%) than females (474, 43.8%). The mean age was 45.2 years (ranging from one month to 95 years); 152 patients (14%) were below 10 years of age. More than half the number (569, 52.6%) were aged 50 and above (Table 1). Majority of the patients were Malays (783, 72.4%) followed by Chinese (Table 2).

Table 1: Age and gender distribution of the patients (n=1081)

Age	Male	Female	Number (%)
1 month-10 years	88	62	150 (13.9)
11-20 years	41	18	59 (5.4)
21-30 years	57	39	96 (8.9)
31-40 years	50	38	88 (8.1)
41-50 years	69	50	119 (11.0)
51-60 years	117	121	238 (22.0)
61-70 years	124	93	217 (20.1)
71-80 years	55	48	103 (9.5)
81-90 years	5	5	10 (0.9)
91-100 years	1	–	1 (0.1)
Total	607	474	1081 (99.9)

Table 2: Race distribution of patients (n=1081)

Race	Number (%)
Malay	783 (72.4)
Chinese	184 (17.0)
Indian	68 (6.3)
Indonesian	22 (2.0)
Bangladeshi	11 (1.0)
Orang Asli	10 (0.9)
Myanmar	3 (0.3)

The prevalence of various eye diseases is shown in Table 3. Some patients suffered more than one eye disease. Therefore, the total number of diseases in the table will be more than the total number of patients in the study. Chalazion was the most common eyelid disease (eight out of 26, 30.7%), followed by blepheritis. Conjunctivitis accounted for 60 among the 89 (67.4%) conjunctival diseases, followed by pterygium. Corneal infections (of any type) were seen in 18 out of 28 (64.3%) corneal diseases. Cataract was the commonest eye disease (248, 22.9%).

Table 3: Prevalence of eye diseases (n=1081)

Eye diseases	Number (%)	Eye diseases	Number (%)
Eyelids	**26 (2.40)**	**Glaucoma**	**30 (2.77)**
Chalazion	8 (0.74)	Primary open angle	11 (1.01)
Blepheritis	5 (0.46)	Primary angle closure	2 (0.18)
Herpes zoster ophthalmicus	4 (0.37)	Chronic angle closure	1 (0.09)
Ptosis	2 (0.18)	Phacomorphic	7 (0.64)
Lipoma	2 (0.18)	Phacolytic	1 (0.09)
Dermoid cyst	1 (0.09)	Rubeotic	1 (0.09)
Stye	1 (0.09)	Juvenile	1 (0.09)
Wart	1 (0.09)	Ocular hypertension	1 (0.09)
Epicanthus	1 (0.09)	Glaucoma suspect	5 (0.46)
Basal cell carcinoma	1 (0.09)		

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Lacrimal system	**7 (0.64)**
Dry eyes	5 (0.46)
Nasolacrimal duct obstruct	2 (0.18)
Conjunctiva	**89 (8.23)**
Acute conjunctivitis	54 (4.99)
Allergic conjunctivitis	6 (0.55)
Pterygium	27 (0.25)
Pinguicula	2 (0.18)
Sclera	**4 (0.37)**
Episcleritis	3 (0.27)
Scleritis	1 (0.09)
Cornea	**28 (2.59)**
Corneal ulcer	10 (0.92)
Nummular keratitis	5 (0.46)
Filamentary keratitis	1 (0.09)
Herpetic keratitis	1 (0.09)
Shield ulcer	1 (0.09)
Bullous keratopathy	4 (0.37)
Microcornea	1 (0.09)
Keratoconus	1 (0.09)
Penetrating keratoplasty	2 (0.18)
Corneal opacity	2 (0.18)
Squint	**4 (0.37)**
Convergent squint	3 (0.27)
Divergent squint	1 (0.09)
Trauma	**106 (9.80)**
Periorbital haematoma	20 (1.85)
Preceptal cellulitis	1 (0.09)
Orbital wall fracture	1 (0.09)
Lid laceration	2 (0.18)
Conjunctival laceration	3 (0.27)
Subconjunctival haemorrhage	2 (0.18)
Corneal abrasion	11 (1.01)
Corneal foreign body	48 (4.44)
Corneal laceration	8 (0.74)
Hyphema	2 (0.18)
Mydriasis	1 (0.09)
Anterior uveitis	1 (0.09)
Lens subluxation	1 (0.09)
Vitreous haemorrhage	1 (0.09)
Commotio retinae	1 (0.09)
Macular hole	1 (0.09)
Optic neuropathy	1 (0.09)

Vitreous	**13 (1.20)**
Vitreous haemorrhage	7 (0.64)
Posterior vitreous detachment	6 (0.55)
Retina	**124 (11.47)**
Diabetic retinopathy	78 (7.21)
Central retinal vein occlusion	1 (0.09)
Branch retinal vein occlusion	1 (0.09)
Retinal detachment	6 (0.55)
Cytomegalo virus retinitis	1 (0.09)
Retinitis pigmentosa	2 (0.18)
Macular edema	1 (0.09)
Retinal tear/hole	4 (0.37)
Macular hole	1 (0.09)
Lattice degeneration	2 (0.18)
Age related macular degener	3 (0.27)
Central serous retinopathy	1 (0.09)
Epiretinal membrane	2 (0.18)
Macular scar	1 (0.09)
Drusen	3 (0.27)
Retinopathy of prematurity	19 (1.75)
Optic nerve & visual pathway	**7 (0.64**)
Optic neuritis	2 (0.18)
Papilloedema	1 (0.09)
Optic atrophy	2 (0.18)
Bitemporal hemianopia	1 (0.09)
Left homonymous hemianopia	1 (0.09)
Uveal tract	**6 (0.55)**
Anterior uveitis	3 (0.27)
Posterior uveitis	1 (0.09)
Pan uveitis	2 (0.18)
Orbit	**2 (0.18)**
Exophthalmos	1 (0.09)
Anophthalmos	1 (0.09)
Refractive errors	**84 (7.77)**
Myopia	52 (4.81)
Hypermetropia	18 (1.66)
Astigmatism	14 (1.29)
Lens	**259 (23.95)**
Cataract	247 (22.84)
Subluxated cataract	1 (0.09)
Aphakia	1 (0.09)
Pseudophakia	5 (0.46)

30 cases of glaucoma (primary and secondary) were detected, in which open angle glaucoma was the most common disease (11 out of 30, 36.6%). There was enlargement of optic cup in five patients who were diagnosed as glaucoma suspects and investigated using intraocular pressure and visual fields testing. All the patients were diagnosed as having open angle glaucoma. Out of 275 diabetic patients screened for retinopathy, 78 showed fundus changes of diabetic retinopathy; non-proliferative retinopathy in 53 (mild 38, moderate 13 and severe 12) and proliferative retinopathy in 15 patients. Maculopathy was seen in 22 out of these 78 cases of retinopathy. Out of 19 cases of retinopathy

of prematurity, 10 babies had stage I, one had stage II and eight had stage III retinopathy. 106 (9.8%) patients had ocular trauma, of which 48 (4.4%) had corneal foreign body.

In our study, visual impairment was noted in 8.2% of patients (Table 4). Cataract was the most common disease responsible for severe visual impairment in 11 out of 12 patients (83.3%) and for blindness in 26 out of 35 patients (74.3%).

Table 4: Visual acuity as per WHO categorization among the study population (n=1081)

Visual impairment category	Visual acuity	Number (%)
No visual impairment	6/6-1/18	860 (79.5)
Visual impairment	<6/18-6/60	89 (8.2)
Severe visual impairment	<6/60-3/60	12 (1.1)
Blindness	<3/60-NPL	35 (3.2)
Undetermined*		85 (7.9)

* these were infants screened for retinopathy of prematurity and vision could not be tested

DISCUSSION

WHO fact sheet (October 2011)[7] on visual impairment and blindness stated that globally 285 million people were visually impaired: 39 million were blind and 246 million had low vision; about 90% of the world's visually impaired lived in developing countries; globally, uncorrected refractive errors were the main cause of visual impairment; cataracts remained the leading cause of blindness in middle- and low-income countries; the number of people visually impaired from infectious diseases had greatly reduced in the last 20 years; and 80% of all visual impairments could have been avoided or cured.

Our study provides data on the spectrum of eye diseases discovered in a district hospital. The Temerloh Hospital provides eye care services in seven districts and majority of the population live in rural areas; the patients were examined over a period of six months.

We discovered that prevalence of visual impairment (8.2%) among the rural population was similar to the urban population (8.2%)[3] in Kuala Lumpur. However, it is higher than in Kuala Selangor (5.6%)[4] and much lower than 18.9%[5] in Sepang based on our studies conducted there. The reason for this variation could be the age group and number of patients examined in these two studies i.e. 18 years and above (282 patients) in Kuala Selangor and 40 years and above (311 respondents) in Sepang. The prevalence of visual impairment and blindness varies geographically due to socio-economic factors, availability of health services and awareness of eye diseases among the population. The prevalence of visual impairment (0.9–29.4%) reported among different countries is shown in Table 5.

Table 5: Prevalence of visual impairment in selected countries

Author	Country	Visual impairment
Whitfield *et al.*[8]	Kenya	2.5%
al-Faran & Ibechukwe[9]	Saudi Arabia	25.6%
Baasanhu *et al.*[10]	Mongolia	8.1%
Singh *et al.*[11]	India	29.4%
Hirvela & Laatikainen[12]	Finland	10.1%
Negrel *et al.*[13]	Turkey	1.9%
Vassileva *et al.*[14]	Bulgaria	0.83%
Zarihun & Mabey[15]	Ethiopia	1.7%
Nwosu[16]	Nigeria	1.7%
Ho *et al.*[17]	Singapore	15.2%
Zainal *et al.*[4]	Malaysia	5.6%
Reddy *et al.*[5]	Malaysia	18.9%
PRESENT STUDY	Malaysia	8.2%

Cataract prevalence among the rural population of Pahang (23%) was only slightly higher compared to a rural district Sepang (20.1%).[5] However, diabetic retinopathy was noted in higher frequency (7%) in our study whereas it was only 1.3% in Selangor. This could be attributed to higher number of diabetic patients referred for eye-check ups by other government health centres/district hospitals. Our study also provided information on the prevalence of retinopathy of prematurity (1.7%), which was not covered by earlier studies on Malaysia.

LIMITATIONS

It must be emphasised that our study does not include all the eye patients in Temerloh who would have visited clinics nearer to their residence. The prevalence in our study may not be fully accurate because those (in far flung villages) suffering from eye problems that did not cause them pain or redness in the eyes may not seek medical attention due to logistical difficulties.

CONCLUSIONS

Our findings indicated that visual impairment in children was due to refractive errors but in adults it was due to cataract, diabetic retinopathy and glaucoma. The prevalence of visual impairment can be reduced greatly by providing health education and awareness on eye care in primary health care centres and through regular visits to ophthalmologist and optometrist.

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