Risk factors for low vision amongst individuals aged 40 years and above in the subdistrict of Beranang, Hulu Langat, Selangor

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Abstract

A cross-sectional study on a member of each households aged 40 years and above from 5 randomly sampled villages in Beranang, Hulu Langat, Selangor between August 2000 to December 2000 was carried out to determine the prevalence and risk factors of low vision amongst them. Out of 260 respondents, 21.5% were found to have low vision with the majority (55.4%) being due to cataract. The proportion with low vision was highest amongst those aged 60 years and above with a significant difference in the proportion of respondents with low vision amongst the various agegroups. The risk of having low vision was almost eight times higher amongst those in the elderly agegroup as compared to the adult respondents. Those with diabetes mellitus, problem with distant vision and blurring of vision had a higher risk of having low vision.

Key words: Low vision, risk factors

Introduction

The World Health Organization (WHO) estimated that there are 180 million people world-wide with visual disability and of these 40 to 45 million are blind and cannot walk unaided (WHO, 2000). It is predicted that this figure will double over the next 25 years, unless decisive public health action is taken. Visual disability is also one of the current health problems in Malaysia. The extent and magnitude of visual disability is unknown since registration and reporting of visual defects are not mandatory in Malaysia. However, based on the National Eye Survey in 1996, the prevalence of blindness was estimated to be 0.28% (55,000) if blindness is defined as inability to count fingers at the distance of 3 meters (Ministry of Health Malaysia, 1996). The number with low vision was 2.4% (450,000) with the major causes of low vision being refractive errors (48.3%) followed by cataracts (35.9%) (Ministry of Health Malaysia, 1996). In the same survey conducted by the Ministry of Health Malaysia (1996) an exponential increase of low vision was observed amongst those 40 years and above. Cataract is one of the age-related causes of low vision especially amongst the older adults although ageing is not the only cause of cataract. The other risk factors for cataract include excessive exposure to the sun's ultra-violet rays, diet inadequate in anti-oxidant vitamins and protein, dehydration, cigarette smoking and alcohol consumption, steroids and diabetes mellitus (Clayton et al., 1982; West

et al., 1998). Restoration of vision amongst older adult sufferers of low vision can be achieved through early detection and screening for low vision. Preventive efforts should also focus on all possible risk factors for low vision amongst the high risk age group.

Materials and Methods

This cross-sectional study was undertaken in the subdistrict of Beranang, Hulu Langat Selangor between August 2000 to December 2000 to determine the prevalence and risk factors for low vision amongst adults aged 40 years and above. Out of 12 villages in Beranang, a total of 5 villages were chosen randomly. A member aged 40 years and above from each household of the 5 chosen villages were invited to undergo a visual screening test at the eye clinic held at the Community Hall. Data on diet, medical and eye problems as well as social habits were collected by trained interviewers using a standardized questionnaire. Visual acuity screening was performed on respondents by trained health personnel. Individuals with low vision was requested to have their visual acuity screened again using the pin hole to look for an improvement in visual acuity and thus differentiating it from myopic disorders. Following screening of visual acuity, individuals had their eye examined by Medical Officers for eye pathologies such as scarring, corneal

opacity and cataract. Visual acuity was determined using the Snellen Chart with the respondent standing 6 meters from the chart. Failure to read more than half of the letters in a particular row designated the result of the Snellen Chart reading. Low vision was defined as visual acuity of less than 6/18 and better than or equal to 3/60 in the better eye using available means of correction while blindness was visual acuity of less than 3/60 (0.05) in the better eye using available means of correction. The presence of silhouette against the red fundus reflex or loss of red fundus reflex denote cataract while myopia (short-sightedness) was difficulty in seeing distant objects with visual acuity of less than 6/18 in the better eye which improved when viewed through a pin-hole. Medical conditions suffered by respondents were recorded as reported. A respondent who had smoked before or was currently smoking during the survey irrespective of the duration of smoking and the number of cigarettes sticks smoked per day was considered as a smoker. The data collected was processed and analyzed using the software SPSS®. Parametric tests appropriate for the types of variable were utilized for normally distributed data while non-parametric test was utilized for not normally distributed data.

Results

Out of 811 individuals ≥ 40 years from 5 villages who were invited to be screened at the eye clinic held at the Community Hall, 260 (33.3%) responded and this exceeded the appropriate sample size of 240 for this study. A total of 122 males and 138 females participated in the survey. There were significantly more males than females in the ≥ 60 years age group (p = 0.007) among respondents. The mean age for males was 60.9 years while that for females was 56.4 years.

Out of 260 respondents 56 (21.5%) were found to

have low vision. Of those with low vision 31 (55.4%) were found to have cataract, 2 (3.6%) cataract with pterygium and 23 (41.1%) with myopia.

Fig. 1 shows the age specific proportion of clinical eye conditions. Low vision and cataract seemed to increase with age with the increase in low vision parallel to that of cataract. There was a steep increase in cataract and low vision after the age of 60 years.

The rate of low vision was highest amongst those ≥ 60 years with the highest prevalence being those in the 70 to 79 years age group. The mean age for those with low vision was 68.3 ± 11.1 years while those with normal vision were 55.7 ± 10.7 years. There was a significant difference in the proportion of individuals with low vision within the various age groups (p = 0.000).

Table 1 shows the socio-demographic risk factors for low vision. Amongst those with low vision, 82.1% were those ≥ 60 years (elderly). There was a significant difference in the rate of low vision between adults and the elderly people.

Amongst those with low vision, 32 (57.1%) were males and 24 (42.9%) were females (p = 0.097). Even though there was a higher prevalence of males who had low vision as compared to females this was not statistically significant.

The same table shows the distribution of respondents by social factors and low vision. Smoking and dietary habits did not have a significant influence on low vision. Intake of traditional herbs and medication also had no significant influence on the rate of low vision.

Table 2 shows the distribution of respondents by health problems suffered and low vision. Respondents who suffered from diabetes mellitus had a higher risk of having low vision compared with those without diabetes mellitus. Hypertension did not pose as a risk factor for low vision.

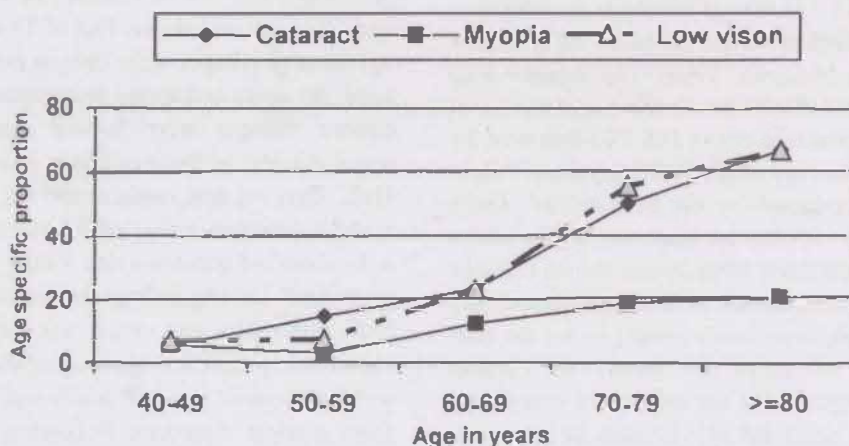Table 2 also shows the distribution of respondents by

Figure 1. Age specific proportion of clinical eye conditions.

Table 1. Distribution of respondents by socio-demographic factors and low vision

Socio-demographic factors	Normal vision	Low vision	Odds ratio	Confidence interval	χ^2	p value
Age group						
Adult	132 (64.7%)	10 (17.9%)	8.43	3.83, 19.03	37.04	0.00
Elderly	72 (35.3%)	46 (82.1%)				
Gender						
Female	114 (55.9%)	24 (42.9%)	1.69	0.89, 3.20	2.49	0.11
Male	90 (44.1%)	32 (57.1%)				
Smoking habit						
Yes	48 (23.8%)	15 (26.8%)	1.17	0.57, 2.42	0.08	0.772
No	154 (76.2%)*	41 (73.2%)				
Takes vitamin supplementation regularly						
Yes	77 (38.1%)*	23 (41.1%)	0.88	0.59, 2.16	0.06	0.805
No	125 (61.9%)	33 (58.9%)				
Consumes vegetables regularly						
Yes	200 (98.5%)**	55 (98.2%)	1.21	0.59, 1.85	0.02	0.869
No	3 (1.5%)	1 (1.8%)				
Takes traditional medicine regularly						
Yes	64 (31.4%)	18 (32.1%)	0.97	0.49, 1.91	0.00	0.958
No	140 (68.6%)	38 (67.9%)				

*2 did not respond to the question; **1 did not respond to the question

eye problems and low vision. There was a statistically significant association between respondents complaining about having problem with distant vision and low vision. Those with blurring of vision also had a higher risk of having low vision compared with those without this complaint.

Discussion

A total of 21.5% of respondents had low vision and this exceeded the prevalence of low vision found in the National Eye Survey, 1996. The rate of low vision in the National Eye Survey was 2.4% with the majority being due to cataract. This could be due to the fact that only those with eye problem came for eye screening while others who did not think they had an eye problem declined to participate in this study. The majority of cases with low vision in this study was also due to cataract and this was similarly observed in the National Eye Survey (Ministry of Health Malaysia, 1996).

In a study on blindness and low vision by Negrel *et al.* (1996) in Turkey it was found that the prevalence of low vision was 1.5% while that for blindness was 0.4%. The majority of low vision was due to cataract. In another

study in India (Singh *et al.*, 1997), the prevalence of low vision was 32% amongst the adult population. In a National Survey carried out in Lebanon, the prevalence of low vision was found to be 3.9% (Mansour *et al.*, 1997). Although the prevalence of low vision in most societies is low, the condition tends to increase with age, cataract being the main contributor of low vision and blindness. In the study by Gray (1996) amongst the elderly residing in Tower Hamlets, it was found that the prevalence of low vision was 24.6%.

It was also found in this study that the rate of low vision increased with age. This trend was similarly seen in the National Eye Survey in 1996 (Ministry of Health Malaysia, 1996). The risk of having low vision amongst the elderly group was 8.43, this being significantly higher than that for adults (p = 0.00). There was no significant association between low vision and gender. In a study by Carter (1994) it was evident that low vision became more prevalent with age. In the study by Hall *et al.* (1998) it was found that increasing age remained a significant predictor of low vision after controlling for the effects of eye diseases.

Table 2. Distribution of respondents by health problems suffered and low vision

Health problems	Normal vision	Low vision	Odds ratio	Confidence interval	χ^2	p value
Diabetes mellitus						
No	34 (16.7%)	7 (12.5%)	1.40	0.55, 3.70	0.30	0.582
Yes	170 (83.3%)	49 (87.5%)				
Hypertension						
No	144 (70.6%)	42 (75.0%)	0.80	0.38, 1.65	0.23	0.631
Yes	60 (29.4%)	14 (5725.0%)				
Eye problem						
No	38 (17.4%)	7 (12.5%)	1.48	0.58, 3.90	0.46	0.500
Yes	166 (82.6%)*	49 (87.5%)				
Problem with distant vision						
No	104 (51.0%)*	41 (73.2%)	2.84	1.42, 5.76	9.41	0.002
Yes	100 (49.0%)	15 (26.8%)				
Problem with near vision						
No	59 (28.9%)**	21 (37.5%)	0.68	0.35, 1.22	1.14	0.285
Yes	145 (71.1%)	35 (62.5%)				
Glaring						
No	96 (47.1%)	19 (33.9%)	1.73	0.90, 3.37	2.56	0.109
Yes	108 (52.9%)	37 (66.1%)				
Blurring						
No	122 (59.8%)	20 (35.7%)	2.68	1.39, 5.19	9.34	0.002
Yes	82 (40.2%)	36 (64.3%)				
Diplopia						
No	178 (87.3%)	46 (82.1%)	1.49	0.62, 3.51	0.582	0.446
Yes	26 (12.7%)	10 (17.9%)				

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