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The Association between Myopia and Gender in Indian Schoolchildren in Kuala Lumpur

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ABSTRAK

Satu kajian penyaringan penglihatan dilakukan terhadap pelajar sekolah India di sekitar Kuala Lumpur untuk menentukan sama ada prevalen myopia adalah lebih tinggi di kalangan pelajar lelaki atau perempuan. Seramai 749 orang pelajar (49.7% lelaki dan 50.3% perempuan) berumur antara 7-18 tahun telah disaring dan ralat refraksi mereka diperiksa dengan menggunakan retinoskopi tanpa sikloplegia. Untuk mata kanan 15.1% daripada pelajar perempuan didapati mengidap myopia berbanding dengan 16.9% pada mata kanan pelajar lelaki, yang mana chi square tidak menunjukkan perbezaan yang bererti (p = 0.44). Bagi mata kiri 18.8% daripada pelajar perempuan mengidap miopia berbanding dengan 16.4% pelajar lelaki. Chi square juga tidak menunjukkan perbezaan bererti (p = 0.26). Bagi kuasa mata tinggi (> -6.00D) tidak ada perbezaan didapati antara pelajar perempuan dan lelaki. Bilangan pelajar yang mengidap myopia tinggi melebihi -6.00D adalah kecil (0.3-0.5%). Sebagai kesimpulannya didapati tidak ada perbezaan myopia antara pelajar perempuan dan pelajar lelaki di kalangan pelajar kaum India.

Kata kunci: myopia, jantina, kanak-kanak sekolah, India, retinoskopi

ABSTRACT

A vision screening study was carried out among Indian schoolchildren around Kuala Lumpur to determine whether the prevalence of myopia was higher in boys or girls. Altogether 749 students (49.7% boys and 50.3% girls) aged 7-18 years were screened and their refractive error examined using retinoscopy without cycloplegia. For the right eye 15.1% of the girls' eyes were found to be myopic as compared to 16.9% of the boys, of which chi-square showed no significant difference (p = 0.44). For the left eye 18.8% of the girls' eyes were myopic as compared to 16.4% of the boys. Chi square also showed no significant difference (p = 0.26). When high myopia (> -6.00D) was considered, there was no difference found between boys and girls. The number of students with high myopia greater than -6.00D was also very small (0.3%-0.5%). In conclusion, it

was found that there was no significant difference in myopia between girls and boys among Indian schoolchildren.

Key words: myopia, gender, sex, schoolchildren, retinoscopy

INTRODUCTION

Myopia is common and main cause of visual impairment among schoolchildren. If left untreated those schoolchildren with myopia may have such poor vision that their academic progress may be affected simply because they cannot see the blackboard clearly. The advent of spectacles to correct myopia has helped millions of people to see clearly and attain a quality of life which otherwise may not be possible. The prevalence of myopia in schoolchildren in the three different races in the country has been studied. Results showed that by the time schoolchildren entered secondary schools (12-18 years of age), the Chinese had a prevalence of 47%, followed by Malays (20%) and Indian (19.4%) (Garner et al. 1987; Norhani et al. 1992; Saadah et al. 2002). Ethnic and racial differences may contribute to the differences in the prevalence of myopia between the different racial groups in Malaysia.

Previous reports on the prevalence of myopia according to gender were mixed. Some studies showed no significant differences in myopia between boys and girls whilst others showed significant differences (Nicholls 1940; Goldschmidt 1968; Peckham et al. 1977; Boselli 1990; Lam et al. 2004; Zadnik et al. 2003). The differences had been attributed to difference age of maturity between boys and girls and possible bias in sample selection. Norhani et al. (1993) showed that among Malay schoolchildren the proportion of girls who had myopia was significantly higher than boys. Malay girls had shorter axial length and higher crystalline lens power as compared to boys and these probably contributed to the higher myopia found in Malay girls. However, a later study on Chinese schoolchildren showed no significant differences in myopia between boys and girls (Chung et al. 1995).

The objectives of this study were to determine whether there was any association between myopia and gender in Indian schoolchildren and the percentage of them with high myopia greater than -6.00D.

MATERIALS AND METHODS

A vision screening study was conducted among Indian schoolchildren around Kuala Lumpur. A list of special schools was obtained from the Ministry of Education and convenience sampling chose about eight schools from the list. All Indian children from the schools were invited to participate in the study and written consent was obtained from parents prior to the study. Modified clinical

technique was used for screening. Parameters measured included visual acuity, cover test, refractive errors, keratometry, and ultrasonography. Their refractive errors were determined using retinoscopy without cycloplegia and expressed as spherical equivalent refractive error. Myopia was defined as having a spherical equivalent power of -0.50D or greater. Schoolchildren were grouped according to their gender and a chi-square test (SPSS package) was carried out to determine whether there was any difference between sexes in the prevalence of myopia. Indian schoolchildren whose myopia were greater than -6.00D were also identified.

RESULTS

Altogether about 749 schoolchildren were examined. The age and sex distribution of the schoolchildren is shown in Table 1. Three hundred seventy seven (50.3%) of the schoolchildren were girls and 372 (49.7%) were boys. Table 2 shows the distribution of myopia greater than -0.50D for both the right and left eyes of the boys and girls. About 15.1 % of the girls' right eyes were found to be myopic as compared to 16.9% of the boys. For the left eye 18.8% of the girls' eyes were myopic as compared to 16.4% of the boys'. Chi-square analysis between the boys' and girls' eyes showed no significant differences between them. (Right eye c^2 = 0.60, p = 0.44, Left eye c^2 = 1.28, p = 0.26). Table 3 showed the number of

TABLE 1. Number of Indian schoolchildren examined by age and sex

Age (Yrs)	Female	Male
7-8	60	38
9-10	63	60
11-12	73	74
13-14	109	91
15-16	56	65
17-18	16	44
Total	377	372

TABLE 2. Prevalence (%) of myopia –0.50D or greater by sex

Sex	Right eye		Left eye	
	N	%	N	%
Female	57	15.1	71	18.8
Male	63	16.9	61	16.4
Total	120		132	

Chi-square; p = 0.44 and p = 0.26 for the right and left eye consecutively

TABLE 3. The prevalence (%) and number of schoolchildren who had myopia greater than –6.00D

Sex	Examined	Right eye		Left eye	
		N	%	N	%
Female	377	1	0.3	0	
Male	372	0		2	0.5
Total	749				

eyes identified to have high myopia greater than -6.00D. It was found among all schoolchildren screened the percentage of high myopia was very small (0.3% - 0.5%).

DISCUSSION

Our study found that there was no significant difference in the prevalence of myopia between boys and girls in Indian schoolchildren in Kuala Lumpur. The prevalence of myopia was found to be low as compared to previous study on prevalence of myopia in different ethnic races in Malaysia. Norhani et al. (1993) found that the prevalence for Malays boys and girls were 12% and 17% respectively. Malay girls were found to be more myopic as compared to boys. A study on Chinese schoolchildren in Kuala Lumpur also showed the prevalence of myopia in Chinese was high as compared to that of Indian schoolchildren around Kuala Lumpur. The proportion of boys with myopia was 41.5% as compared to 43.5% of girls in the Chinese schoolchildren. Chung et al. (1995) found that there was no significant difference in myopia between boys and girls. A study by Zadnik et al. (2003) in Caucasian population found no significant difference in myopia between girls and boys although girls tend to have steeper cornea, steeper crystalline lens and shorter eyes compared to boys. Lam et al. (2004) found no difference in prevalence of myopia between sexes in Chinese schoolchildren in Hong Kong.

Dandona et al. (2002) reported that Indian schoolchildren living in rural population in state of Andhra Pradesh, India showed no significant difference in myopia between girls and boys age 7-15 years old. This is an agreement with our present study. However Dandona et al.'s study showed the prevalence of myopia among children 7-15 years old was 4.1% as compared to 16% prevalence in our study. The difference could be due to a larger sample size in Dandona's study and their samples were from rural areas. In another study among urban population in India, Dandona et al. (1999) reported a prevalence of 4.4% of myopia in subjects 15 years of age or younger. For children 15 years of age or older the

prevalence was 19.4%. No difference in myopia was reported between boys and girls in these older schoolchildren.

Our study also showed that there was a very small (0.3-0.5%) amount of high myopia among Indian schoolchildren in Malaysia. Our previous study showed 1.4% of Chinese and 1.3% of Malays had high myopia greater than –6.00D (Norhani et al. 1993; Chung et al. 1995). High myopia is of concern to eye care professionals because of its susceptibility to diseases such as retinal detachments and myopic degenerations which may lead to vision being impaired in its later stages. It is important that myopic children are properly counseled and seek periodical examination when diagnosed with high myopia.

In conclusion, our results contribute to the general agreement of myopia with no predilection to gender in Indian schoolchildren.

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REFERENCES

Boselli, A. 1990. La Ametropie Nelle Scuole Elementori di Bolona. In: Gorsvenor T & Flom MC (eds). *Refractive Anomalies*. Boston: Butterworth Heinemann.

Chung, K.M., Yeow, P.T., Norhani, M., Oleary, D.J. 1995. The association between Myopia and gender in Chinese School Children. *Sains Malaysiana* 24(3): 67-71.

Dandona, R., Dandona, L., Srinivas, M., Sahare, P., Narsaiah, S., Munoz, S.R. 2002. Refractive error in children in a rural population in India. *Invest. Ophthalmol. Vis. Sci*. 43(3): 615-622.

Dandona, R., Dandona, L., Naduvilath, T.J., Srinivas, M., Mccarthy, C.A., Rao, G.N. 1999. Refractive errors in an urban population in Southern India: the Andhra Pradesh Eye Disease Study. *Invest. Ophthalmol. Vis. Sci.* 40(12): 2810-2818.

Garner, L.F., Norhani, M., Chung, K.M., Kaur, S., Manan, F.A., Freeland, E., & Siti Nariman, S.I. 1987. Prevalence of visual disorders in Malay schoolchildren. *Sains Malaysiana* 16(3): 339-446.

Goldschimdt, E. 1968. On the aetiology of myopia. An epidemiological study. *Acta Ophthalmol. Suppl.* 98: 1-72.

Lam, C.Y.S., Goldschmidt, E., Edwards, M.H. 2004. Prevalence of myopia in local and international schools in Hong Kong. *Optom. Vis. Sci*. 81(5): 317-322.

Norhani, M., Chung, K.M., Yeow, P.T., Oleary, D.J., Tan, L.L. 1992. Cacat penglihatan di kalangan pelajar Cina. Laporan Akhir Penyelidikan UKM Kod 29/90, pp 1-19.

Norhani, M., Chung, K.M., Garner, L.F. 1993. Myopia and sex in Malay schoolchildren. *Sains Malaysiana* 22(3): 97-101.

Nicholls, J.V.V. 1940. A survey of ophthalmic conditions among rural schoolchildren. *Canadian Med. J.* 42: 553-556.

Peckham, C.S., Gardiner, P.A., Goldstein, H. 1977. Acquired myopia in 11 year old children. *Br. Med. J.* 1: 542-545.
Saadah, M.A., Norhani, M., Chung, K.M., Bariah, M.A., Zainora, M., Sharanjeet, K. 2002. Masalah penglihatan di kalangan pelajar India di Kuala Lumpur. Laporan akhir Penyelidikan UKM N12/98, pp 1-26.
Zadnik, K., Manny, R.E., Yu, J.A., Mitchell, G.L., Cotter, S.A., Quiralte, J.C. 2003. Ocular component data in schoolchildren as a function of age and gender. *Optom. Vis. Sci.* 80(3): 226-36.

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