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LETTER TO EDITOR

PREVALENCE AND PROGRESSION OF REFRACTIVE ERRORS AMONG MEDICAL STUDENTS

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Sir,

Wearing spectacles was a province of adults over 40 years age till half century earlier. Now we find more children and adolescents wearing spectacles. There have been dramatic rise both in prevalence as well as progression of refractive errors especially myopia in children and adolescents. Various studies in Asian population demonstrate a rise in refractive error (RE) among school and college students in epidemic proportions. Studies in Singapore and Taiwan have shown a prevalence of more than 80% among medical students (1, 2). However European Caucasian population seems to have less prevalence compared to Asian (3, 4). Studies among Indian school children show a prevalence of refractive errors of 25% or less, however studies among medical students are lacking (5, 6). This study was undertaken to explore the prevalence of refractive errors among medical students in Gujarat, India as well as to study factors affecting its progression among them.

Study involved participants from the Baroda Medical College, Gujarat. After approval from institutional ethical committee, age, height and weight were noted. Students were assessed for refractive errors at ophthalmology department and were asked to fill up a questionnaire regarding their different habits. The students were grouped depending on the absence or presence of refractive errors as group I and group II respectively. Chi square test was used to compare proportions and students't' test was used to compare the means. P value of <0.05 was considered statistically significant.

A total of 90 students (34 females and 56 males) participated in the study. Mean age was 23.8±2.9 years (range 23-26 years). There was no significant difference in age (24.2±3.21 vs 24.6±2.69 years) and weight (51±6.32 vs 50.6±5.18 kg) of the subjects with or without refractive error, but mean height (158±4.12 vs 163±5.96 cm, $P<0.05$) was significantly higher in group II.

Prevalence rate of RE among medical students in Gujarat, India was 55.60%, which is less than the prevalence rate among medical students of other Asian populations like in Singapore (89.8%) or Taiwan (92.8%) (1, 2). These variations may be attributed to ethnicity and different genetic predispositions. Increased height is associated with increase length of eyeballs which may contribute to myopia. Such association of height with myopia has been seen by Seing-Mei et al in 2002 in Singapore Chinese children and by Teasdale et al in adults of Danish population (7, 8).

Studying the type and progress of

refractive errors among group II it was found that 20% had astigmatism, 20% had combined myopia and astigmatism, and 60% had myopia alone. Mean duration of refractive error among those with astigmatism was 6.20 years with no progress during medical studies. Those with myopia and astigmatism together had mean duration of 18.38 years with rise of 0.5 Dioptres (D) after entering medical college. Whereas, myopic students had mean duration of 15.05 years and an increase of 2.75±1.2 D after entering medical college.

Only 3.3% of the students developed RE during medical studies and the progression of RE was higher among myopics then those with astigmatism or myopia+astigmatism. As observed by some authors myopia is more prevalent among the better educated and more intelligent population (9). Medical students may have more stringent near work habits right from their school days, even before entering medical college, which may explain the findings of our study. Loman J et al in 2003 observed similar finding among law students in USA (10).

Also as shown in table I, it was found that the reading habits were quiet stringent in group II. In-group I most (92%) used moderate intensity light. Mean reading hours were similar among 2 groups, however 80% of students in group II preferred reading/ watching movies as leisure activity. Watching TV and computer use were significantly more in-group II. Mean time spend in playing games/texting with cell phones was significantly higher in-group II. Mean sleep hours were similar (7.2 vs 7.6 hours). Night lamp was used during sleep by more percentage of group I students (25% vs 24%, P>0.05).

Myopia prevalence was more associated with longer near work, computer work, playing/texting with cell phones and TV watching. More reading hours were not associated with more progression of RE in contrast to finding of Seang-Mei Saw who

TABLE I: Comparison of habits of the two groups.

	Group I – No refractive errors (N=40)	*Group II – Refractive errors present (N=50)*
1. Family history of RE	30 (75%)	43 (86%)*
2. Reading hours/day	5.2±0.52	6±0.98
3. Type of Light used during reading	Dim light – 25% Moderate light – 75% Bright light – 0%	Dim light – 0% Moderate light – 66.67% Bright light – 33.33%
4. Use of night lamp during sleep	10 (25%)	12 (24%)
5. Duration of TV watching (hours/day)	2.03±0.5	5.4±1.02*
6. Duration of computer use (hours/day)	1.1±0.05	1.7±0.03*
7. Duration of play/texting with cell phone (hours/day)	0.5±0.02	2±0.04*
8. Total duration of sleep (hours/day)	7.2±0.08	7.6±0.02
9. Activity preferred during leisure time	50%-reading 30% - computer use 20% - outing/watch TV	80% - Reading/movie watching 20% - computer/watching TV

Data expressed as mean±SD. *P<0.05 on comparing with group-I.

found a positive correlation of progression of RE with reading hours (11). Extent of accommodation required for reading is more than the accommodation required for watching TV. However playing/texting with cell phones that too in variable backgrounds with altering lights is more straining to eyes than simple reading.

Comparing student's in-group II to students without RE in group I it was observed that group II had significantly stronger family history of myopia. Mehdizadeh et al in 2006 found a similar contribution of family history and computer use among myopics (12).

The extensive nearwork such as reading and writing involved in medical studies as well as the long and intensive course in medical colleges may lead to the high prevalence of myopia among medical students (1, 9). In our study genetic and familial factors have a stronger relation with RE as supported by some authors (12). We suppose that the new generation gadgets like computer and cell phones have replaced reading as the main near work activity among modern students. This may explain why in our study almost equal time spend in reading has not predisposed to RE.

Thus prevalence of refractive errors among Indian medical students was slightly lower than other Asian population but higher than their Caucasian counterparts. Higher proportion of watching TV, computer or cell phone use, early age of onset of refractive error and presence of family history were strongly associated with RE presence and its progression. The maneuverable habits like computer/TV use, cell phone use, reading in very bright light might be taken care of especially in those with a family history in order to impede the onset of refractive errors as well as once detected then to diminish their progression.

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