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Original Article

Frequency of myopia in childhood in Elazig

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Abstract

Aim: We aimed to evaluate the increase in the frequency of myopia in childhood.

Material and Methods: Between January 2014 and December 2018, the records of under 18 years old children with myopia diagnosed at our hospital were evaluated retrospectively. Distribution of patients of myopia was done according to years, age and sex.

Results: 19,023 patients were included in the study. Mean age was 13.31±2.95. 11,261 (59.1%) of patients were female, and 7762 (40.9%) of patients were male. When the patients are categorized based on their age groups; the number of patients between 0-5 years was 181 (0.95%), the number of patients between 6-10 years was 3594 (18.8%), the number of patients between 11-15 years was 9808 (51.5%) and the number of patients aged 16 years and over was 5,440 (28.5%). When the number of patients according to years in which they applied to the hospital is analyzed; the number of patients in 2014 was 1899 (%9.9), the number of patients in 2015 was 2,768 (14.5%), the number of patients in 2016 was 3,225 (16.9%), the number of patients in 2017 was 4,781(25.1%), and the number of patients in 2018 was 6350 (33.3%). The increase in the number of patients between 2014-2015, 2015-2016, 2016-2017, 2017-2018 is statistically significant ($p<0.05$, $p<0.05$, $p<0.05$, $p<0.05$ respectively).

Conclusion: The number of children with myopia is increasing day by day. Considering the budget that spent for the treatment of myopia and complications caused by high myopia, myopia must be considered as a public health problem, and necessary preventions should be taken for improving the environmental factors that are considered to be involved in etiology.

Keywords: Childhood; myopia; environmental factors

INTRODUCTION

Myopia is one of the leading causes of visual impairment worldwide. It typically develops at school age. Genetic and environmental factors are known to be in the etiology of myopia (1-5). High myopia is a severe public health problem as it is a risk factor for many eye conditions, such as myopic retinal degeneration, retinal detachment, glaucoma, cataract, vision loss and blindness (5-8). The prevalence of myopia is increasing due to the excessive use of digital devices, intensive studying and less time spent outdoors (9).

In this study, the aim was to present an increase of the myopia prevalence in the region between 2014 and 2018.

MATERIAL and METHODS

The hospital data of the pediatric patients under the age of 18 years, who were diagnosed with myopia (if refraction> - 0.5 diopters after examination with cycloplegia) at our hospital were analyzed retrospectively. Repeated admissions were eliminated and enrolled only on the first admission. The number of patients with myopia was evaluated by year, age and gender. The Pearson Chi-square test was used to assess the increase in the number of patients by year (Pearson Chi-Square: 219.282, df:12, $p<0.05$). The P-value <0.05 was accepted as statistically significant. The statistical analysis was performed using the SPSS Statistics v22 running on Windows Vista operating system.

RESULTS

19,023 patients were included in the study. Mean age was 13.31±2.95. 11,261 (59.1%) of patients were female, and 7762 (40.9%) of patients were male. When the patients are categorized based on their age groups; the number of patients between 0-5 years was 181 (0.95%), the number of patients between 6-10 years was 3594 (18.8%), the number of patients between 11-15 years was 9808

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(51.5%) and the number of patients aged 16 years and over was 5,440 (28.5%). When the number of patients according to years in which they applied to the hospital is analyzed; the number of patients in 2014 was 1899 (%9.9), the number of patients in 2015 was 2,768 (14.5%), the number of patients in 2016 was 3,225 (16.9%), the number of patients in 2017 was 4,781(25.1%), and the number of patients in 2018 was 6350 (33.3%). The increase in the number of patients between 2014-2015, 2015-2016, 2016-2017, 2017-2018 is statistically significant ($p<0.05$, $p<0.05$, $p<0.05$, $p<0.05$ respectively) (Table 1).

DISCUSSION

Myopia is the leading cause of correctable visual impairment in childhood. It typically develops at school age. Myopia is known to have a multifactorial etiologies such as gender, family history, genetic factors as well as environmental factors. The prevalence of myopia over the years is rapidly increasing and is becoming a worldwide public severe health problem. The prevalence of myopia in 12-year-old children was reported to be 62% in Singapore, 49% in China, and 20% in the USA (10-12).

Table 1. Distribution of patients by years, age groups and gender

Years	Number of patients	0-5 years	6-10 years	11-15 years	16+ Years	Median age	Girls	Boys
2014	1899	13	315	991	580	13.47±2.82	1097	802
2015	2768[a]	20	430	1468	850	13.52±2.82	1625	1143
2016	3225[a,b]	11	409	1697	1108	13.85±2.66	1792	1433
2017	4781[a,b,c]	39	1058	2396	1288	13.01±3.09	2869	1912
2018	6350[a,b,c,d]	98	1382	3256	1614	12.91±3.14	3878	2472
Total	19023	181	3594	9808	5440	13.31±2.95	11261	7762

[a] Compared to 2014 $p<0.05$
[b] Compared to 2015 $p<0.05$
[c] Compared to 2016 $p<0.05$
[d] Compared to 2017 $p<0.05$

In the USA, approximately 4,6 billion dollars are spent on the treatment of myopia per year (13). This expenditure can be considered a severe economic loss. Factors such as excessive near work, extended computer use, video games, excessive TV viewing, little time spent outdoors were reported to be the most significant environmental factors in the development of myopia (9,14,15).

In our study; we determined that the number of children with myopia increased progressively over the years between 2014 and 2018. The increase was statistically significant ($p<0.05$). Children are subjected to intensive study schedules due to the exam-oriented nature of the education system in our country. We also think that children spend too much time on digital devices, such as computers or mobile phones. Spending a little time outdoors is also one of the environmental factors. In the Indian Myopia Study, which evaluated the prevalence of myopia and the risk factors, the children studying in private schools versus public schools were assessed. The study revealed that the prevalence of myopia was higher in the children studying in private schools. The difference was contributed to the intensive study schedule of the children studying in private schools, the competitive environment, more time spent on digital devices such as computers, as a result of higher socioeconomic status (16). In their study, where Olavi et al. evaluated the genetic and environmental factors playing a role in the progression of myopia, they found that half of the cases with myopia development had its onset at school age. Intensive reading, near work and insufficient time spent outdoors were found to be associated with the onset (17). Hepsen et al. evaluated the effect of intensive reading on the development of myopia in emmetropic school children and found refractive changes toward myopia (18). Due to the retrospective nature of our study, environmental factors could not be evaluated, which may be considered as the limitations of the study.

The exact etiology of myopia in childhood and the underlying mechanisms are still not fully established. Some studies reported that environmental factors such as near work and time spent outside played a role in the development of myopia. However, some studies noted that there was not any correlation between them. Recent studies have reported that near work results in axial elongation (19,20). It was hypothesized that axial length changes might occur as a result of the mechanical forces during accommodation or convergence (19,20,21). The thickening of ciliary muscle with accommodation was reported to be associated with myopia development (22,23). It was reported that near work and computer use contribute to the development of myopia by resulting in eyelid-mediated changes in corneal curvature (24,25).

CONCLUSION

In conclusion; the number of children with myopia is increasing day by day. Considering the budget that spent for the treatment of myopia and complications caused by high myopia, myopia must be considered as a public health problem, and necessary preventions should be taken for improving the environmental factors that are considered to be involved in etiology.

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