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STUDY OF RISK FACTORS INFLUENCING PREVALENCE OF MYOPIA.

Opthalmology

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ABSTRACT

Background : Myopia is the most common Refractive Error with genetic & environmental factors playing role in the progression. Higher incidence of Myopia is noted in children of Myopic parents , similarly increase in near work ,more of indoor activities , & more time spent on Mobile phones, computers, TV , favour rapid myopia progression. **Materials And Methods:** 300 Children ,8- 12 years age ,with Myopia (- 0.50D to - 6.00D)were studied using Questionnaire for genetic history & environmental factors like near work, time spent on Mobile phone, computer & TV etc. **Results :** The present study evaluated effect of behavioural risk factors on Myopia. Results show that near related activity , study/ reading >4hrs. in day, watching TV >2 hrs./day, playing computer/video/mobile, increased the risk of developing Myopia.Outdoor activities decrease the prevalence of Myopia. **Conclusion :** Prevalence of Myopia was more in school children (age 8-12years), with more near work activity & more time spent on visual display units. More time spent on outdoor activity have protective effect on prevalence of Myopia.

KEYWORDS

Myopia, Near work activity, out door activity,Display visual time

INTRODUCTION

Myopia is most common Refractive error where incident parallel rays come to focus anterior to Retina.Behavioral risk factors ,like reading more than 4 hours, watching TV, excessive use of Mobile Phones, Computer vision syndrome increases the risk of developing Myopia.Outdoor activities are protective & is the priority in prevention of Myopia onset. So behaviour control methods focussing on limiting the screen time on Computers, Smart phones,regulated near work timings can be of help in decreasing the risk of Myopia development.

METHODS AND MATERIALS

It was observational cross-sectional ,comparative study conducted at Dr BSA Ambedkar Medical College & Hospital, New Delhi & nearby School children of age 8 to 12 years age. Among 300 Children of age group 8 to 12 years, **Myopic group** had 150 subjects with vision <6/9 and Myopia of >-0.50 to <-6.00D & equal number age matched non Myopic children were included in the **non-Myopic group**. History of Myopia in parents , Siblings also the duration & use of Refractive correction was noted in the Myopic group. Self administered questionnaire was given to the subjects , it was designed to obtain information regarding the modifiable risk factors for Myopia, like duration of near work ,Visual display unit time, out door activity time, reading posture , total number of breaks per hour in

near work & duration of work on Visual display units. All the subjects underwent examination of Anterior segment , Posterior segment & Cycloplegic refraction.

Statistical Analysis

Catagorical variables were presented in number & percentage ; continuous variables were presented as mean +/- SD and median. Normality of data was tested by Kolmogorov –Smirnov test. Statistical tests applied were t-test/Mann-Whitney Test , Chi –Square test , Univariate & multivariate logistic regression . A p- value of <0.05 was considered statistically significant.

OBSERVATIONS AND RESULTS

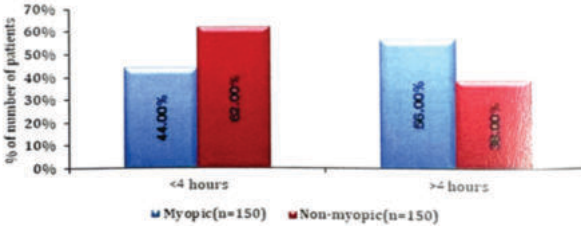

Figure 1. Comparision Of Duration Of Near Work (hours/day) Between Myopic & Non- Myopic .

A total of 300 children of age group 8-12 years participated in the study at Department of Ophthalmology , Dr Baba Saheb Ambedkar Medical College and Hospital, Delhi. In our study 150 children with vision less than or equal to 6/9 with Myopia within -0.50 D & -6.00D were considered in Myopic group & 150 age matched (non Myopic) were taken up.

It was observed that children with **less than 4hrs.**. of near work, the percentage of students was 44% & 62% in Myopic and non- Myopic group respectively.While children with **greater than 4 hrs.** of near work this was 56% and 38% in Myopic and non – Myopic group respectively. Hence Significant association was seen in Myopic Children & long duration of near work.(p value < 0.05)

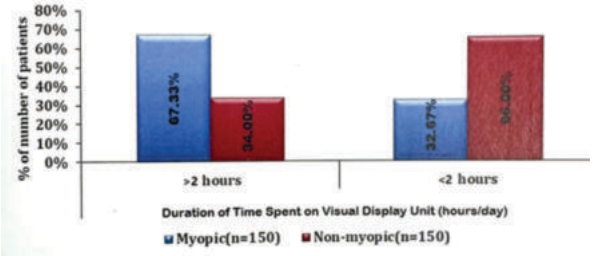

Figure 2: Comparision Of Visual Display Time In Myopic & Non Myopic Group.

It was observed that Children with **less than 2 hrs.** of time spent on Visual display unit , the percentage was 32.67% and 66% in Myopic & non Myopic group respectively : While Children with > 2 hrs of time spent on VDT was 67.33% and 34% in Myopic & non Myopic group respectively. Significant association was seen in children with Myopia and long duration of time spent on VDU.(p value < 0.05)

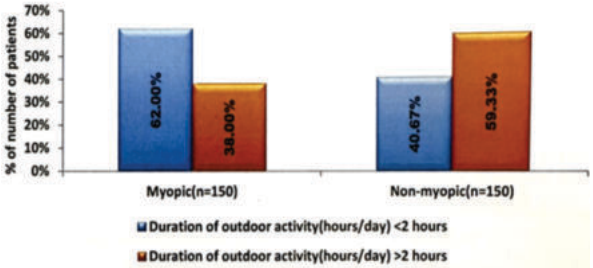

Figure 3: Comparision Of Duration Of Outdoor Activity(hour/ Day) Between Myopic & Non Myopic.

It was observed that average percentage of Myopic Children with outdoor activity of <2hours and > 2hrs was 62% and 38% respectively. While non- Myopic Children with <2 hours and >2 hours of outdoor activity was 40.67% and 59.33% respectively. Significant association was seen in children with Myopia and less duration of outdoor activity (p value < 0.05).

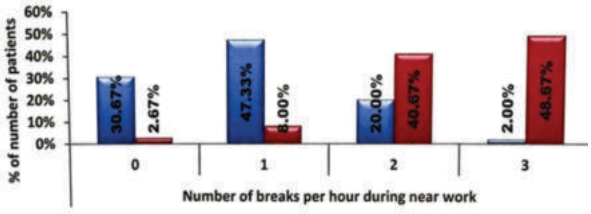

Figure 4: Comparision Of Number Of Breaks Per Hour During Near Work Between Myopic And Non Myopic .

It was observed that total percentage of Myopic and non-Myopic children with no break per hour was 30.67% and 2.67% respectively. Percentage of Myopic with one break ,two break & three break per hour was 47.33%, 20%, 2% respectively. While that in non- Myopic was 8%, 40.67%, 48.67% respectively. Hence significant association was seen in children with less number of breaks and incidence of Myopia.(p value <0.05).

DISCUSSION

Prevalence of Myopia around the world has increased recently. Genetic & environmental factors contribute to this development.Our study found relationship between environmental influences related to prolonged reading or near work, increased time spent on computers, Mobile phones etc & fewer hours spent on out doors are associated with higher incidence of Myopia.

As regards the **near work** , the Myopia progress is observed to coincide with the school years. The exact mechanism is however less clear, it is possible that near work could promote Myopic Eye growth in those with higher levels of near work. Among earlier studies, one conducted in urban School children in Delhi by Saxena R et al (North India Myopia study) & You QS et al, A cross sectional study in urban parts of Beijing found significant association between prevalence of Myopia and increased near work.

Increased digital screen time is associated with early onset of Myopia is also shown by earlier study by Swee Chai Teoh etal (a low sample size study) and another by Gratton etal (conducted on female population of older age group), demonstrated significant Myopic shift after longer & continuous Visual display unit (VDU)work.In our study significant association was seen in children with Myopia and longer duration of time spent on VDU.

Regarding **outdoor activity** our study indicated a significant association in children with Myopia & lesser duration of outdoor activity, while non-Myopic with more time outdoors, have statistically less association with Myopia.It was postulated by Rose et al, that brighter light out doors led to more Dopamine release, which in turn inhibited axial elongation of Eye Ball.

Considering th**e number of breaks per hour** during near work & VDT in Myopic & non- Myopic students, it was found that long duration of near work, with lesser breaks are more important than total number of hours of near work .

CONCLUSION :

In this study we evaluated the effect of behavioural (modifiable) risk factors on Myopia. Based on the data collected & statistical analysis we concluded that , near related activity, such as reading > 4 hours per day, watching TV, Computer, Video, Mobile games for >2 hrs per day increased the risk of developing Myopia. Also total number of breaks per hour during near work activity is an important factor than total number of hours of near work for prevalence of Myopia. More time spent on outdoor activity seems to have a protective effect in prevalence of prevalence of Myopia.

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