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Dynamic and Static Pupil Changes after Near Work: Comparison between Reading a Book and Using a Smartphone

Ali Mirzajani[1], Narges Akhgar[1], Ebrahim Jafarzadehpour[1], Jamileh Abolghasemi[2], Alireza Jamali[1], Zohreh Fakhimi[3]
[1]Rehabilitation Research Center, Department of Optometry, School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran
[2]Department of Biostatistics, School of Public Health, Iran University of Medical Sciences, Tehran, Iran
[3]Department of Optometry, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran

INTRODUCTION: Decreased static pupil size due to accommodation is a common clinical finding; however, changes in pupillary dynamic responses after near work activities such as reading a book and using a Smartphone are not well understood.
METHODS: The present study was performed on 76 right eyes of 76 volunteers (mean age: 20.95±2.34 years) who had ocular near activity more than 4 hours per day. The participants were divided into two groups based on the dominant activity, reading a book (group 1) or using a Smartphone (group 2). Evaluation of dynamic and static parameters of the pupil was performed before and after one hour of continuous routine eye activity in both groups and compared.
RESULTS: Near work reduced pupil diameter in all static components ($p<0.001$), the amount of change in the min pupil diameter (p: 0.039) and mesopic pupil diameter (p: 0.043) were different between two groups and were higher in group 1(both, $p<0.05$). Dynamic elements showed a decrease in initial diameter, amplitude and velocity of contraction and dilation, and an increase in other components; So that the changes after using Smartphone were significant in all dynamic parameters (all, $p<0.05$), But reading the book only made a significant difference in the initial diameter, amplitude, and velocity of contraction and duration of dilation (all, $p<0.05$); the changes were only different in the initial diameter between the two studied groups, which was higher in group 1 (p: 0.047).
DISCUSSION AND CONCLUSION: The present study showed that, reading a book and using Smartphone cause changes in the pupil components, which were decreasing in diameter components and velocity of changes and increasing in latency of changes; the type of ocular work may affect the changes.

Keywords: Static Pupillometry, Dynamic Pupillometry, Near Work, Metrovision Monopack 1