Contact Lens Update
CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Blink animation software to improve blinking and dry eye symptoms

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Digital device use has increased significantly over the past few years,[1-3] with nearly 90% of Americans using digital devices such as laptops, smartphones or tablets for at least two hours each day and almost 60% using these devices for five or more hours each day.[1] Digital eye strain is an unwanted side-effect of using these devices,[1-3] with 65% of Americans reporting symptoms such as blurred vision, dry eye, headache or neck/shoulder/back pain.[1] Symptoms of eye strain have been found to be related to blink rate (BR).[3] Nosch et al. developed new animation software named "blink blink" that can be used during computer work in an attempt to initiate more frequent blink patterns.

Nosch DS et al. Blink animation software to improve blinking and dry eye symptoms. Optom Vis Sci 2015;92(9): e310-15.

Mimicking the process of blinking, two semi-transparent bars move across the computer screen (one from the top and one from the bottom). The software runs in the background, independent of the currently active program or application on the user's PC. The software can be configured to the user's liking, by allowing them to adjust the amount of screen covered, the opacity of the bars, the duration of the animation as well as the time interval of the animated "blink."

Methods: Part A (pilot study)

The study was conducted in two parts. The purpose of part A was to evaluate whether blink rate frequency could be increased while the "blink blink" software was being used. For the purpose of the study, the software settings were configured to have a duration of 600 milliseconds for each animation, a screen coverage maximum of 20% of the computer screen for each of the moving bars (40% in total), and an opacity grade of 25% for both bars. Ten administrative office workers participated in the study.

Baseline blink rate (while watching a movie) as well as concentrated task blink rate (performing a word-search task on a PC) were determined for each participant. Participants were then subdivided into two groups, stratified by number of presentations per minute: participants in the test group were shown the animation dependent on each participant's habitual blink rate as determined in the baseline and concentrated task measurements, while participants in the placebo group were presented with the animation only once per minute, irrespective of their habitual blink rate levels.

Participants used the animation software for one week in their own work environment, and then returned to repeat

the initial baseline and concentrated task blink rate measurements, with the animation software now also running while performing these tasks.

Methods: Part B

Part B investigated whether dry eye symptoms were alleviated when using the software. Twenty-four office workers with symptoms of dry eye (OSDI score of >15.0, modified for PC work) participated, and completed baseline and concentrated PC task blink rate measurements. All software settings were identical to part A, except the time interval between consecutive presentations of the animation, which were set to either four presentations (test) or one presentation (control) per minute.

In part B, participants were asked to blink twice at each presentation of the animation. Each participant used the software with both configurations in a cross-over design for one week each, in randomized order. At the end of each week, participants returned to repeat the baseline and concentrated PC task blink rate measurements while the animation software was running, and also completed the OSDI questionnaire.

Results

Part A: Participants in the test as well as in the placebo group showed an increase in blink rate per minute after one week of software use compared to baseline levels, which was not significant in either configuration ($p>0.06$); there was also no difference between groups ($p=0.166$, presumably due to the small sample size.

Part B: There was a significant increase in blink rate with the test configuration of the program (i.e. 4 presentations/minute), for which there were 6.75 [±3.80] more blinks per minute compared to baseline levels ($p<0.001$). For the control configuration (i.e. 1 presentation/minute), there was no significant increase in blinks per minute (0.50 [±2.83]); $p=0.396$).

Dry eye symptoms improved significantly after one week of software use for both the test and control configuration (both $p<0.001$), with changes in OSDI scores of 5.42 [±2.86] and 1.79 [±1.38] points) for the test and control configuration, respectively.

Acceptance of the software was overall good, with only 4 of the 24 participants indicating that the animation affected their work routine, and 21/24 planning to keep using the software after conclusion of the study.

Conclusions:

For the participants in this study, using the novel blink animation software resulted in an increase in blink frequency and an improvement of dry eye symptoms during computer work. For those willing to try out the software, it can be requested free of charge from Daniela.nosch@fhnw.ch.

REFERENCES

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