Glaucoma study could inspire e-reader apps

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Better strategies are needed to help glaucoma patients cope with difficulty reading. According to a new scientific study published in *Investigative Ophthalmology & Visual Science*, adults with glaucoma read slower when reading silently for long periods of time and are more likely to have their reading speed decrease over time, possibly a result of reading fatigue.

Technological solutions such as e-readers – and the many apps being created for them – could help. "Right now, so many products are available for presenting reading material in a variety of formats," says author Pradeep Ramulu MD, PhD, of The Wilmer Eye Institute, Johns Hopkins Hospital. "If the optimal format for reading in the context of glaucoma could be determined, it would be easy to create an application to present text in this manner as part of a commercial device such as an iPad or Kindle."

The recently published article, "Difficulty with Out-loud and Silent Reading in Glaucoma," reports that the sustained silent reading speed for glaucoma patients with bilateral Visual Field (VF) loss is significantly less than the speed associated with out-loud reading.

The study was conducted with two groups from the Wilmer Eye Institute: patients with bilateral VF loss from glaucoma and the control group made up of glaucoma suspect patients. Both groups were evaluated using two out-loud reading tests (IReST and MNRead), a sustained silent reading test over a 30-minute period and a comprehension evaluation corresponding to the sustained silent reading

material. On the IReST evaluation, those with glaucoma read 147 vs. the control group 163 words per minute (wpm); on the MNRead, those with glaucoma read 172 vs. the control group 186 wpm; and on the sustained silent reading test, those with glaucoma read 179 vs. the control group 218 wpm—a 16 percent slower reading speed.

The results also showed that reading comprehension was lower in the glaucoma group than the control group. Though this finding fell just outside the cutoff for statistical significance, the research team suggests further studies be conducted to investigate whether visual defects or coexisting cognitive defects are the cause.

"The ultimate goal is to be able to rehabilitate individuals with reading difficulties due to glaucoma," says Ramulu. "Our group and others are exploring possible reasons behind these impairments, including disruption of the tear film and aberrant eye movements. Understanding why people with glaucoma read slower and show reading fatigue will pave the way for solving these reading difficulties."

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