Medical Xpress

Peripheral prism glasses help hemianopia patients get around

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This shows permanent peripheral prism glasses for a patient with left hemianopia, providing about 30 degrees of visual field expansion into the blind left visual field. Credit: Mass. Eye and Ear/Schepens Eye Research Institute

More than a million Americans suffer from hemianopia, or blindness in one half of the visual field in both eyes as the result of strokes, tumors or trauma. People with hemianopia frequently bump into walls, trip over objects, or walk into people on the side where the visual field is missing.

Peripheral prism glasses, invented by Eli Peli, M.Sc., O.D., Professor of Ophthalmology at Harvard Medical School and Senior Scientist at Massachusetts Eye and Ear/Schepens Eye Research Institute, use high power prism segments embedded in a regular spectacle lens to expand the upper and lower visual fields of patients with hemianopia by as much

as 30 degrees. The prisms optically shift objects from the blind side of the visual field to the seeing side, thereby alerting people with hemianopia to objects and obstacles not otherwise visible to them.

Although the results of early clinical evaluations of the peripheral prism glasses suggested that they were helpful for obstacle avoidance when walking, the device had never previously been compared to either another rehabilitation intervention for hemianopia or to a sham device. A multi-center study (NCT00494676) led by Alex Bowers, Ph.D., Assistant Professor of Ophthalmology at HMS and Assistant Scientist at Massachusetts Eye and Ear/Schepens Eye Research Institute, set out to determine if real peripheral prism glasses were more helpful than sham peripheral prism glasses for patients with hemianopia during everyday walking. Their research is published online in *JAMA Ophthalmology*.

Patients with hemianopia were recruited at 12 clinics in the United States of America and 1 clinic in the United Kingdom. The study used a "crossover" design in which each participant wore two pairs of glasses: a pair of real peripheral prism glasses, providing about 30 degrees of field expansion, and a pair of sham peripheral prism glasses, identical to the real prism glasses, but providing less than 2 degrees of field expansion. Half of the participants wore the real prism glasses first and the sham prism glasses second, and half wore the sham glasses first and the real glasses second. Each pair of glasses was worn at home for four weeks. The data collector at each clinic was masked and did not know whether a participant was wearing real or sham glasses. Participants were also masked, and were informed that one pair of glasses was a sham only after they had completed the study.

"The main outcome measure was the overall difference between the number of participants who wanted to continue using the real prisms as compared to the number of participants who wanted to continue using the sham prisms," said Dr. Bowers.

Of the 73 people randomized, 61 completed the crossover period. A significantly higher proportion selected the real prisms than the sham prisms (64 percent vs. 36 percent, respectively). Participants who completed the study cited that the main reason for selecting the real prism glasses over the sham prism glasses was that the real glasses were helpful for obstacle avoidance when walking, while the sham glasses were not. By comparison, the main reason for selecting the sham over the real prism glasses was that they were more visually comfortable or had caused fewer difficulties. "These results emphasize the importance of including a control (placebo/sham) condition when evaluating a rehabilitation device," said Dr. Bowers.

Forty-one percent of patients were still wearing the real peripheral prism glasses after six months, reporting that the prism glasses were helpful for obstacle avoidance when walking outdoors, in crowded places, shopping malls and unfamiliar places.

Dr. Bowers concluded: "Peripheral prism glasses provide a simple and inexpensive mobility rehabilitation intervention for hemianopia."

Provided by Massachusetts Eye and Ear Infirmary

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