Study finds many people with hemianopia have difficulty detecting pedestrians while driving

November 12 2009

Schepens Eye Research Institute scientists have found that--when tested in a driving simulator--patients with hemianopia (blindness in one half of the visual field in both eyes) have significantly more difficulty detecting pedestrians (on their blind side) than normally sighted people. These results, published in the November 2009 issue of *Investigative Ophthalmology and Visual Science*, fly in the face of some recent on-road studies that have found most people with hemianopia safe to drive.

"The results are important because they mean we need to continue to look carefully at people with this condition and evaluate them individually to determine their fitness to drive," says Dr. Eli Peli, principal investigator of the study and senior scientist at Schepens Eye Research Institute.

In at least 22 states and many other countries, people with hemianopia are prohibited from driving because they do not meet the visual field requirements for licensure.

"Our study urges caution in opening the door for people with hemianopia to start or continue driving again," says first author, Dr. Alex Bowers, who is an Assistant Scientist at Schepens. She and Peli believe the Schepens study, because it was conducted in the safety of a driving simulator over a longer period of time and "miles" than a typical "on-road" study, provides new insights into detection failures of drivers with

hemianopia. These detection failures might not be revealed in a short on-road test in which there is little control over the appearance of potential "blind-side" hazards.

More than a million people suffer from hemianopia, a condition in which one half of the visual field in both eyes is blinded, usually the result of a stroke or head injury. People with hemianopia often do not know what they can't see and frequently bump into and trip over objects while walking. Driving is a whole other challenge.

Peli and his research team compared 12 subjects with hemianopia to 12 visually normal people, matched by age, sex, and years of driving experience. All subjects drove for about 120 minutes along city roads and rural highways. During the journey pedestrians appeared at random intervals along the roadway and at intersections.

Subjects pressed the horn button every time they saw a pedestrian. The team then measured detection rates and response times based on these horn-press responses.

The scientists found that drivers with hemianopia had much lower detection rates on their blind side than normally sighted subjects (or their own seeing side), detecting on average only about 45% of pedestrian figures. When pedestrians were seen on the blind side, response times were about twice as long as those of the normally sighted drivers. They also found a large variability in blind-side detection rates among the individuals with hemianopia (from 6% to 100%) with the lower rates found among the older subjects.

Although overall most subjects with hemianopia had detection rates that seem incompatible with safe driving, Bowers cautions that "the relationship of our simulator detection performance measures to on-road performance has yet to be established, another reason to treat each

person with hemianopia individually as they seek approval to get back on the road."

The next step for the team is to determine whether an optical aid that expands the visual field - peripheral prism (expansion prism EP) glasses - might be a useful device for drivers with hemianopia. Specifically, they plan to conduct another driving simulator study to investigate whether drivers with hemianopia have better detection rates for pedestrians on the blind side when using the glasses than when driving without them.

Source: Schepens Eye Research Institute