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Electronic glasses compensate for visual field loss

FROM THE SPECIALTIES

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We have investigated whether electronic glasses can improve function for persons with tunnel vision due to retinitis pigmentosa and those with visual field loss after a stroke.

We have published the theoretical basis for the use of electronic glasses by persons with visual field loss (1). Some glasses improve function for persons with tunnel vision due to retinitis pigmentosa, as shown in videos 1 and 2 at tidsskriftet.no, and for those with hemianopia following a stroke – as shown in video 3 (2–4). The benefits for those with macular degeneration have not been demonstrated for the glasses we investigated.

Electronic glasses currently on the market are primarily developed for gaming or entertainment. They are equipped with substantial computing power, which makes them both expensive and energy-intensive. They are also difficult to operate for persons with visual impairments. The placement of the screen, the weight of the glasses, power consumption and heat buildup can all pose challenges, and some glasses cause headaches (5). The image can disappear in strong sunlight. Virtual reality (VR) glasses obstruct the user's functional visual field, can cause dermatological issues due to moisture in the VR headset, and lead to neck strain (6).

Improvements

There has been a desire to develop electronic glasses with a simple, user-friendly design, lightweight construction, moderate computing power, long battery life and reliable performance in sunlight. We have developed an app for the glasses shown in videos 2 and 3 that puts the glasses into retinitis pigmentosa/hemianopsia mode when switched on.

The benefits of using electronic glasses can be further enhanced by connecting an AI voice assistant. Mobile phone apps have been developed to support this.

Need for training

Persons with visual field loss require visual rehabilitation support and training in the use of electronic glasses. Adaptation training requires a comprehensive approach, where the glasses are combined with other assistive devices, such as mobility canes.

We are seeking collaborations with developers in the field of electronics and screen technology to develop these assistive devices.

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