Editorial

Driving blind - Should tests of visual function be mandatory for driving license?

In 2017, there were 464,910 road traffic accidents in India and 147,913 fatalities, accounting for an accident every minute and a death every 3.5 minutes.[1] Causes of road traffic accidents are multifactorial. However, over 80% of accidents and fatalities are directly attributable to driver error.[2] Perceptual and cognitive functions that have an impact on driver safety and driver performance include visual functions, auditory skills, biomechanical skills, speed judgment and adaption, reaction time, and attention.[3,4] Visual functions contribute to about 90% of perceptual and cognitive inputs essential for safe driving, and hence are important assessable physical parameters to evaluate potential driver safety.[5]

Poor vision is estimated to be linked to more than 3,000 fatalities and serious injuries resulting from road traffic accidents every year in the United Kingdom.[6] Typically, drivers involved in road traffic accidents are not evaluated for visual functions, which is a limiting factor in accumulating hard data directly attributing poor visual performance as the cause for road traffic accidents. No such data exists in India.

Visual acuity by itself may not be a good predictor of driving safety.[7,8] Other objectively assessable components of visual function comprise of visual fields, color vision, contrast sensitivity, night vision, glare sensitivity, useful field of view, stereopsis and diplopia, each of which has an important role in driving safety and performance.[7,8] Assessment of multiple components of visual function may prove more useful in discriminating high- and low-risk drivers.[7,8] Vision-specific requirements for driving vary from country to country.[9] Most countries mandate visual acuity of 20/40 in the better eye and horizontal visual field of 120°, whereas color vision specifications are diverse.[8] United Kingdom, Australia, and several states in the United States follow more stringent visual function standards for commercial driving license.[10-12] In the United Kingdom, for private driver license, visual acuity of 6/12 is mandated.[10] For commercial drivers, visual acuity of 6/7.5 in the better eye is the prerequisite.[10] Horizontal field of vision of 106° with 70° towards left and right and 30° above and below, with no defects in the central 30° field is required.[10] In Australia, visual acuity of 6/12 and 110° horizontal field of vision is essential for a private driving license.[11] For commercial driving license, visual acuity of 6/9 in the better eye and 140° horizontal field of vision is required. If visual acuity is <6/24, driver license is rejected. Color vision, except for protanopia, is not mandatory for driving private vehicles.[10]

In India, driving license is issued by the Regional Transport Offices of each state and the procedure is regulated by the Motor Vehicle Act (MVA) 1988, amended in 2017. As per sub-section 3 of section 8 of the MVA, a self-declaration (form 1) to drive a nontransport vehicle and a medical certificate from a registered medical practitioner (form 1A) to drive a transport vehicle are the only formal requirements. Self-declaration form 1 carries three questions related to visual function – 1. Is the applicant able to distinguish a motor car number plate from 25 meters, 2. Is the applicant able to distinguish pigmentary coolers red and green, and 3. Does the applicant have night blindness? Medical examination form carries the same questions to be answered by a registered medical practitioner but does not mandate any specific test or assessment criteria. If the number plate letter size is standard 65 mm, ability to see it from 25 meters approximately translates to a visual acuity of 20/40 and is rather subjective. Unfortunately, the MVA amendment of 2017 did not include general vision-specific criteria for driving license. Monocular patients, however, currently have prescribed visual function standards for driving license---visual acuity of 20/40 in the remaining eye, horizontal visual field of 120°, and monocular adaption period of 6 months.

There is gross underreporting of visual disability at the time of primary application for driving license or renewal. Several studies in India conclusively show that the active licensed drivers have significant visual morbidity that would predispose them to the risk of road traffic accidents.[3,5] This issue of Indian Journal of Ophthalmology carries important information about the lacunae in issuing driving license in India in patients with established glaucoma.[9] In a cohort of patients with glaucoma, legal license renewal procedure was bypassed by 45%, only 7% self-reported glaucoma, none were asked about their visual field during renewal, only 10% of those medically certified were examined by an ophthalmologist, 44% experienced driving difficulties, and glaringly, 30% of those who got a driving license would not have satisfied the International College of Ophthalmologists' (ICO)

Table 1: International Council of Ophthalmology vision requirements for driving safety

Visual Acuity	20/40 or better	No visual acuity-based objection to an unrestricted driving license
	< 20/40 to 20/200	Individual consideration, which may result in restrictions or denial. Evaluation should include visual and non-visual factors and a road test when in doubt.
	< 20/200	No driving license
Visual Field	120° horizontal, 40° vertical or better	No visual field-based objection to an unrestricted driving license, provided that the field is about evenly divided around fixation and that no attention-related problems were identified.
	Worse	Individual consideration, which may include restrictions. Evaluation should include visual and non-visual factors and a road test.

vision requirements for driving safety guidelines.[9] Evidently, there are unacceptable lacunae in prescribing mandatory standards of visual function and tests to assess the same for the purpose of issuing a driving license in India.

Without reinventing the wheel, we can use the existing ICO vision requirements for driving safety guidelines [Table 1].[8] Apart from these objective recommendations, ICO further elaborates that 1. persons who do not meet the screening criteria should be referred for further evaluation by a vision specialist, 2. in older drivers, testing of glare and contrast sensitivity should be considered, 3. driving licenses should have a defined renewal period, and 4. the visual and driving performance of older drivers should be assessed regularly, starting at the age of 65 years. ICO suggests restricted license to improve the safety margin especially for those who have prior driving experience and a good driving record but fail the standard screening criteria. Suggested restrictions include limitation to daylight driving, restriction to a reasonable radius from home, restriction to familiar areas, speed limitation, no highway driving, and more frequent retesting based on the prognosis of the condition.

Objective screening for vision, color vision, and visual fields under standardized testing conditions should be mandatory for obtaining and renewing the driving license in India. Those who fail the initial screening should undergo a protocol-based comprehensive evaluation (including relevant objective tests for visual function) by an ophthalmologist and certified if fit to drive. A local expert review board could determine the suitability to issue a restricted driving license, a temporary or a permanent denial for those who partially or completely fail the vision-specific requirements. They may consider the prognosis of the ophthalmic morbidity, past driving experience, safety record, and current driving performance among the parameters to review. Apart from baseline screening, every driver involved in a cognizable road traffic accident should ideally have visual functions reassessed by an ophthalmologist.

The relationship of good visual function and driving safety are innately and unarguably linked and have a direct bearing on the incidence of road traffic accidents. Appropriate modification of the existing laws and expedited implementation are mandatory to minimize visual function-related road traffic accidents-, an avoidable cause of mortality and morbidity. This is a very serious issue and needs immediate societal and legislative attention.

Santosh G Honavar

Editor, Indian Journal of Ophthalmology,
Editorial Office: Centre for Sight, Road No 2, Banjara Hills,
Hyderabad, Telangana, India.
E-mail: editorjournal@aios.org

References

1. Available from: http://pib.nic.in/newsite/PrintRelease.aspx?relid=181092. [Last accessed on 2019 Jan 18].
2. Available from: https://www.geographyandyou.com/disaster/disaster-events/track-troubles-road-accidents-in-india. [Last accessed on 2019 Jan18].
3. Verma A, Senathipathi V, Chakrabarty N, Srinivas S. Recommendations for driver licensing and traffic law enforcement in India aiming to improve road safety. Curr Sci 2012;100:1373-85.
4. Dewar RE, Olson PL, Alexander GJ. Human Factors in Traffic Safety, 2nd ed. Tuscon, Arizona: Lawyers and Judges Publishing Company; 2007.
5. Chakrabarty N, Lakshman A, Gupta K, Bhatnagar A. Visual challenges among drivers: A case study in Delhi, India. Int J Innov Res Sci Eng Technol 2013;2:3074-83.
6. Available from: https://blog.motoringassist.com/news/gem-renews-call-for-overhaul-of-driver-eyesight-regulations. [Last accessed on 2019 Jan 18].
7. Owsleya Cm McGwin G Jr. Vision and Driving. Vision Res 2010;50:2348-61.
8. Colenbrander A, De Laey JJ. Vision requirements for driving safety with emphasis on individual assessment. Report prepared for the International Council of Ophthalmology at the 30th World Ophthalmology Congress. Sao Paulo, Brazil, February 2006. Available from: www.icoph.org/pdf/visionfordriving.pdf. [Last accessed on 2019 Jan 18].
9. Murthy GJ, Deshmukh AV, Mallidi AR, Murthy PR, Kattige JS, Murthy VR. Renewal of driving license in India and glaucoma: A study of prevalent practice and its lacunae. Indian J Ophthalmol 2019;67:240-6.
10. Available from: https://www.gov.uk/driving-eyesight-rules 32. [Last accessed on 2019 Jan 18].
11. Optometry Victoria Strategic Plan 2015–18. Available from http://www. optometrists.asn.au/vic/practiceinfo/driving-vision-standards.aspx. [Last accessed on 2019 January 18].
12. Steinkuller PG, Legal vision requirements for drivers in the United States. Am Med Assoc J Ethics 2010;12:938-40.

Access this article online

Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_150_19

Cite this article as: Honavar SG. Driving blind - Should tests of visual function be mandatory for driving license? Indian J Ophthalmol 2019;67:193-4.