Cognition and driving in older persons

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Abstract

In Switzerland, approximately 350 000 people aged 70 years or older own a valid driving license. By law, these drivers are medically assessed every other year, most commonly by their general practitioner, to exclude that a medical condition is interfering with their driving skills. A prerequisite for driving is the integration of high-level cognitive functions with perception and motor function. Ageing, per se, does not necessarily impair driving or increase the crash risk. However, medical conditions, such as cognitive impairment and dementia, become more prevalent with advancing age and may contribute to poor driving and an increased crash risk. The extent to which driving skills are impaired depends on the cause of dementia, disease severity, other co-morbidities and individual compensation strategies. Dementia often remains undiagnosed and therefore general practitioners (GPs) can find themselves in the difficult situation to disclose a suspicion about cognitive impairment and whether to medical fitness to drive. At the same time, in addition, the literature suggests that cognitive screening tests, most commonly used by GPs, have a limited role in judging whether an older person remains fit to drive. Further specialist assessment, for example in a memory clinic or on the road testing (ORT), may be helpful when the diagnosis or its implication for driving remains unclear.

Keywords: ageing; mild cognitive impairment; dementia; driving

Introduction

Driving is the ultimate instrumental activity of daily living (IADL) [18] and it requires the integration of high-level cognition, vision, and motor function. Numerous cognitive functions are important for driving. The most relevant among them are summarised below [17, 18].

Visual information selection (i.e., visual attention)

Visual attention is a process that selects visual stimuli based on their spatial location. It is crucial for driving, for example when detecting road side targets. Impaired visual attention is an early and unspecific feature of many disorders. Tests commonly used to assess visual attention are the Trail Making Test A (TMT-A) [19] or the useful field of view test (UFOT) [20]. The TMT-A is a paper- and pencil test [19] in which participants have to connect, as quickly as possible, pre-drawn numbers in ascending order (1-2-3-4-5, etc.). The UFOT [20] is a computer-assisted test, which measures visual awareness in the peripheral field of view. Several studies have suggested that impaired UFOT or trail making are associated with poor driving and increased crash risk [21-23]. Both tests are usually not available in the office of GPs, but subtests are commonly used in a specialist setting (e.g., specialist driving assessment centre or Memory Clinic). In the specialist setting, other aspects of attention relevant for driving can be tested as well, such as sustained (i.e., the ability to maintain attention without interference) and divided attention (e.g., the ability to respond simultaneously to multiple tasks) [24, 25]. Impaired visual attention is a common, diagnosis-unspecific, early feature of dementia [26, 27].