Long-term effects of Advanced Driver Assistence Systems (ADAS) on driving performance of older drivers with and without mild cognitive or physical impairments: A driving simulator study

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The present PhD thesis focuses on the investigation of ADAS and the older driver. Even though, recent research investigated the effects of ADAS on driving performance, little is known about the long-term effects of the systems on performance....

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Movement disorders (incl parkinsonism)
Study type	Interventional

Summary

ID

NL-OMON36501

Source
ToetsingOnline

Brief title
The Older Driver

Condition

- Movement disorders (incl parkinsonism)
- Dementia and amnestic conditions

Synonym
mild cognitive impairment, very mild dementia

Research involving
Human

Sponsors and support

Primary sponsor: Europese Commissie
Source(s) of monetary or material Support: European Committee;Marie Curie ITS Adaptation

Intervention

Keyword: ADAS, aging, cognitive impairments, driving

Outcome measures

Primary outcome

Objective scores derived from driving performance in driving simulator, main study parameters are the number of crashes and traffic conflicts (near crashes) and a compound score for hindrance to other traffic based on the deviation of the speed from the optimal speed for the various road and traffic situations. Secondary parameters are the average and standard deviation of lateral position on straight sections and around intersections. Norm violations are also investigated as well as workload, acceptance, and trust in the system.

Secondary outcome

Secondary parameters are the average and standard deviation of lateral position on straight sections and around intersections. Norm violations are also investigated as well as workload, acceptance, and trust in the system.

Study description

Background summary

The number of older drivers still operating a vehicle is increasing rapidly. With ageing, the prevalence of neurodegenerative disorders such as Parkinson*s disease (PD) and Alzheimer*s disease (AD) increases. Even in very mild forms these disorders lead to visual, cognitive, and motor impairments interfering

with driving, particularly in situations with time pressure and divided attention requirements. Driving is very important for quality of life in older drivers; therefore, methods to support impaired older drivers to remain safely mobile are required. Advanced Driver Assistance Systems (ADAS) can play an important role if they are tailored to the needs and capabilities of impaired older drivers.

Study objective

The present PhD thesis focuses on the investigation of ADAS and the older driver. Even though, recent research investigated the effects of ADAS on driving performance, little is known about the long-term effects of the systems on performance. Therefore, the central questions are whether and in how far the use of general and/or tailored ADAS improves driving performance over time of impaired drivers and in how far they appreciate the support given by the system.

Study design

Mixed study design with repeated measures.

Intervention

For the purpose of the study, participants will repeatedly drive a 25 km city drive in the UMCG driving simulator during which they will receive important traffic related information. Important traffic information will be conveyed through a head up display (HUD). Route information will be given orally. A group comprised of healthy older drivers, drivers with mild cognitive impairment and drivers with Parkinson*s disease who do not receive traffic information throughout all trials will serve as a control group.

Study burden and risks

When driving in a simulator, some people experience simulator sickness, which feels like motion sickness. Based on previous studies, the driving simulator at the UMCG has been optimized with regard to the prevention of simulator sickness and therefore in our regular clinical assessment, it is not a problem anymore. In the experimental set up proposed here, several 90 degree turns must be made, which we prevent in clinical assessment, so that more people might suffer from simulator sickness. To prevent that from interfering with the research, a short preliminary assessment is made in a test situation with many turns. People complaining about simulator sickness will be excluded from the study.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Inclusion criteria (general)
- Age between 65 years and 80 years
- Valid driver*s license
- More than 20 000 km of total driving experience
- Still driving regularly (driving at least once a week for the last year)
Inclusion criteria (PD or MCI)
- Diagnosis of Parkinson*s disease with mild to moderate symptomatology (Hoehn and Yahr 1-2)
- Diagnosis of Mild Cognitive Impairment or very mild dementia (CDR < 1)

Exclusion criteria

- Mild to moderate dementia (CDR >= 1)
- Sensitivity to simulator sickness/ motion sickness
- Other serious disorders (except PD and MCI) that interfere with driving (stroke, schizophrenia)
- Visual acuity less than 0.6
- Visual field less than 120° on the horizontal dimension

Study design

Design

Study phase:	2
Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Prevention

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	29-05-2011
Enrollment:	36
Type:	Actual

Ethics review

Approved WMO

Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL35335.042.11