厚生科学研究費補助金（認知症対策総合研究事業）
分担研究報告書

認知症高齢者の自動車運転の中長期的予後について
～背景疾患による運転継続期間の差異についての考察～

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研究要旨

認知症患者の背景疾患による運転継続期間の差異について、高知大学精神科認知症データベースをもとに調査した。対象は1995年-2009年9月までの認知症患者132名である。背景疾患はアルツハイマー病（AD）63名（男性/女性＝41/22）、血管性認知症(VaD)36名（男性/女性＝34/2）、前頭側頭葉変性症(FTLD)33名(男性/女性＝25/8)で、平均年齢70.7±10.3歳(AD/VaD/FTLD＝69.1±11.0/76.3±6.3/FTLD68.3±9.6)、平均MMSE19.0±5.9(AD/VaD/FTLD＝19.4±5.8/17.4±5.2/FTLD20.3±6.2）であった。認知症の重症度はCDRで0.5/1/2/3別ではAD群（23/27/12/1）/VaD（3/25/8/0）/FTLD（13/14/6/0）であった。調査内容は臨床診断から運転中断までの期間（月）と、認知症発症から運転中断までの期間（月）を認知症の背景疾患別で評価した。

臨床診断から運転中断までの期間は全体では14.6±13.8ヶ月（中央値10.5ヶ月）であった。背景疾患別の臨床診断-運転中断までは AD/VaD/FTLD＝18.1±14.9/10.5±8.6/11.9±14.6 ヶ月であった。中央値では AD/VaD/FTLD ＝14.0/8.0/3.5 ヶ月であった。認知症発症から運転中断までの期間は全体では32.0±20.8ヶ月（中央値27.0ヶ月）であった。背景疾患別の臨床診断-運転中断までは AD/VaD/FTLD＝36.4±19.6/25.9±18.6/29.0±23.8 ヶ月であった。中央値ではAD/VaD/FTLD ＝34/22.5/21.5ヶ月であった。

臨床診断後の平均運転継続可能期間の長さでは AD 群（18.1 ヶ月）＞FTLD群（11.9ヶ月）＞VaD群（10.5ヶ月）と、AD群が最も長く、VaD群が最も短かった。認知症発症後から運転中断まではAD群（36.4ヶ月）＞FTLD群（29.0ヶ月）＞VaD群（25.9ヶ月）の順でAD群が最も長く、VaD群が最も短かった。一方中央値の比較では、診断後から中止までは、AD群（14. 0ヶ月）＞VaD群（8.0ヶ月）＞FTLD群（3.5ヶ月）とFTLD群が最も短期間であり、認知症発症後から中断までの期間でもAD群（34.0ヶ月）＞VaD群（22.5ヶ月）＞FTLD群（21.5ヶ月）とFTLD群が最も短期間であった。この乖離の背景には運転期間継続期間が症例ごとにバラつきが大きいことが考えられた。そのため、いつまで認知症患者は運転継続可能かの指標としては、平均期間比較より、中央値比較の方がより臨床的指標として有用と考えられた。

認知症の発症及び診断後から中止までの運転継続期間は背景疾患によっても大きな差異があり、運転継続期間の比較では平均期間よりも中央値比較が臨床的に有用であると考えられた。

A．研究目的

認知症患者の自動車運転がいつまで可能か、またどのようになれば運転中断がなされるべきかの議論は多いが、明かになっていない。そこで今回我々は認知症の背景疾患別による運転継続期間の差異について、高知大学精神科認知症データベースをもとに調査した。

B．研究方法

対象は高知大学医学部付属病院および関連病院を 1995 年-2009 年 9 月までに受診し、認知症の診断があり、初診時自動車の継続を行っていた認知症患者 132 名である。対象者の背景疾患はアルツハイマー病（AD）63 名（男性/女性＝41/22）、血管性認知症(VaD)36 名（男性/女性＝34/2）、前頭側頭葉変性症(FTLD)33 名（男性/女性＝25/8)である。調査内容は、臨床診断、年齢、性別、MMSE、認知症の重症度評価として CDR（Clinical Dementia Rating）で運転継続期間は臨床診断から運転中断までの期間（月）と、認知症発症から運転中断までの期間（月）を認知症の背景疾患別で評価した。

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C．研究結果

(1) 基本的背景

平均年齢 70.7 ± 10.3 歳（AD/VaD/FTLD＝69.1±11.0/76.3±6.3/FTLD68.3±9.6）、平均 MMSE19.0±5.9（AD/VaD/FTLD＝19.4±5.8/17.4±5.2/FTLD20.3±6.2）であった。認知症の重症度はCDR で0.5/1/2/3 別ではAD 群(23/27/12/1)/VaD(3/25/8/0)/FTLD（13/14/6/0）であった。

(2) 運転継続期間

1) 臨床診断から運転中断まで

臨床診断から運転中断までの期間は全体では 14.6±13.8 ヶ月（中央値 10.5 ヶ月）であった。背景疾患別の臨床診断－運転中断までは AD/VaD/FTLD ＝ 18.1 ± 14.9/10.5 ± 8.6/11.9±14.6 ヶ月であった。中央値では AD/VaD/FTLD ＝14.0/8.0/3.5 ヶ月であった。

2) 認知症発症から運転中断まで

認知症発症から運転中断までの期間は全体では 32.0±20.8 ヶ月（中央値 27.0 ヶ月）であった。背景疾患別の臨床診断－運転中断までは AD/VaD/FTLD ＝ 36.4 ± 19.6/25.9 ± 18.6/29.0±23.8ヶ月であった。中央値では AD/VaD/FTLD＝34/22.5/21.5 ヶ月であった。

D．考察

臨床診断後の平均運転継続可能期間の長さではAD群(18.1ヶ月)＞FTLD群（11.9ヶ月）＞VaD群（10.5ヶ月）と AD 群が最も長く、VaD 群が最も短かった。認知症発症後から運転中断までは AD 群（36.4 ヶ月）＞FTLD 群（29.0 ヶ月）＞VaD 群（25.9 ヶ月）の順で AD 群が最も長く、VaD 群が最

も短かった。一方中央値の比較で診断後から中止まではAD群(14.0ヶ月)＞VaD群（8.0ヶ月）＞FTLD群（3.5ヶ月）とFTLD群が最も短期間であり、認知症発症後から中断までの期間でもAD群（34.0ヶ月）＞VaD群（22.5ヶ月）＞FTLD群（21.5ヶ月）とFTLD群が最も短期間であった。この乖離の背景には運転期間継続期間が症例ごとにバラつきが大きいことの影響している可能性が高く、平均期間比較よりは、中央値比較の方がより臨床的指標として有用と考えられた。

E．結論

認知症の発症及び診断後から中止までの運転継続期間は背景疾患によっても大きな差異があり、運転継続期間の比較では平均期間よりも中央値比較が臨床的に有用であると考えられる。

研究協力者

谷勝良子、井関美咲、福島章恵、赤松正規、今城由里子（高知大学医学部神経科精神科）

F．健康危険情報

本調査研究に際しては高知大学倫理委員会の承認を得た。また研究対象者にはアンケート調査書面にて調査同意を得て施行した。

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RESEARCH ARTICLE

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Differences in perceptions regarding driving between young and old drivers and non-drivers in Japan

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Objective: The issue of driving cessation for dementia patients is one of the urgent public health priorities in Japan and is often complicated, with family or social barriers yet to be sufficiently addressed. Because the possibility of dementia or family caregiving can befall anyone, we focused on the disparity in people's perceptions of driving as possible barriers. The present study aimed to assess perceptions of driving among the general public and examine differences in perceptions based on age and driving status.

Methods: A survey was conducted in a sample of the general public aged 40 and over in Japan. Respondents were 1010 people who received a self-administered questionnaire that included questions regarding perceptions about driving and sociodemographic factors.

Results: The drivers that participated in this study tended to highly agree that 'driving is a "right" which we all deserve', compared with the non-drivers. The most common reason for reluctance to stop driving among drivers was the possible loss of personal mobility. Apart from transportation, older drivers were more likely than younger drivers to value the qualitative aspects of driving, for example, driving was viewed as 'a motivating factor in my life'.

Conclusions: These disparities in the general public's perceptions about driving may be possible family or social barriers to driving cessation in the case of drivers with dementia. Our findings also suggest that when addressing the need for driving retirement, not only mobility but also the qualitative aspects of driving be paid more attention. Copyright © 2010 John Wiley & Sons, Ltd.

Key words: older drivers; driving cessation; perception; general public; dementia

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Introduction

The number of older drivers has been increasing dramatically as Japan's population ages. People aged 65 and older account for 21% (27 million) of the total population in Japan. The number of licensed drivers over 65 ('older drivers') exceeded 11 million in 2007, accounting for 14% of the total drivers of all ages. The number of drivers in the older population is about 40% which is much lower than the 80% in the younger population under age 60 who drive. However, automobiles are nonetheless a practical form of transportation for older people, and driving can play a key role in maintaining independence.

Given that advanced age is associated with a higher risk of chronic diseases as well as physical, sensory and cognitive impairments, older drivers are considered to be vulnerable to having motor vehicle crashes (Anstey *et al.*, 2005). Indeed, during 2008 in Japan, the traffic accident rate was estimated at 863 cases per 100 thousand older drivers, the third highest after 1685 cases in the 16–24 age group and 1036 cases in the 25–29 age group (Traffic accidents situation, National Police Agency (NPA), 2009). Moreover, the accident

rate among drivers under age 65 tended to decrease in the past decade, whereas that among older drivers remained at a high level.

Thus, the Japanese government has enforced a traffic safety campaign targeting older drivers and has paid special attention to older drivers suffering from dementia, who are considered a high-risk group. In 2002, Section 103 of the Road Traffic Act was amended. In the amended Act, dementia was included as a reason for license revocation, stating that if a driver is found to be 'demented', his/her driving license shall be revoked (Arai Y and Arai A, 2005; Arai Y, 2006). Such efforts can lead to raising the national profile of driving and dementia. However, there are several challenges related to implementation of the Act. It is not easy to identify drivers who suffer from dementia without guidelines and mandatory reports from physicians. In addition, without a clear consensus regarding the progressive decline of cognitive functions, it is difficult to decide when drivers should stop driving (Arai, 2006; Hirono, 2006). This has raised concern that many drivers may continue to drive after onset of dementia, as reported in previous studies (Odenheimer, 1993; Dobbs *et al.*, 2002; Adler and Kuskowski, 2003; Herrmann *et al.*, 2006).

The NPA reported that nationwide only 192 drivers had their driver's licenses revoked due to dementia over the last four years since the law was amended. Moreover, the most common reason for license revocation was 'concerns of family members' (133 cases), which was followed by 'police activity' (e.g., handling a traffic accident) (59 cases) ('Older drivers: introduction of cognitive assessments' (Japanese), *The Daily Police News*, 20 October 2006). Our previous study regarding family caregivers of current and former drivers who had dementia ($n=21$) showed that a primary reason for driving cessation among former drivers was because 'family caregivers discovered the patient was driving dangerously' (48%), followed by 'patients and family caregivers were persuaded by physicians' (14%), 'traffic accidents' (14%), and 'other' (2%) (Arai A *et al.*, 2006). Cotrell and Wild (1999) demonstrated that either the patient or caregiver was responsible for decisions regarding driving status in most cases of those with Alzheimer's disease (AD) who stopped driving. Similarly, Perkinson *et al.* (2005) reported from focus-group interviews that most of the stakeholders with respect to driving by persons with AD believed that family members had primary responsibility for identifying and dealing with unsafe drivers. Thus, family members of dementia patients play a pivotal role in decision-making regarding patients' driving and in supporting the eventual goal of driving cessation.

However, the decision of driving cessation is often complicated for longtime drivers, and even more so for those with dementia and their family caregivers for a number of reasons: (1) rejection by drivers due to the symptoms of dementia such as memory impairment or unawareness of deficits; (2) rejection by drivers due to a strong need to drive, i.e., because it is a necessary form of transportation; and (3) conflicts between drivers and their family members due to different perceptions about driving such as opinions as to what driving means to the person who is driving. These reasons, including ones which are not necessarily related to dementia, can hinder driving cessation from occurring at the most appropriate time, jeopardizing personal and public safety.

Although much of the literature has focused on examining the medical and non-medical predictors of driving cessation in older adults with dementia (Wackerbarth and Johnson, 1999; Adler and Kuskowski, 2003; Carr *et al.*, 2005; Herrmann *et al.*, 2006), little is known about what kinds of difficulties exist between dementia patients and family members with respect to patients' driving cessation. As Carr *et al.* (2006) have suggested, research is needed regarding family or social barriers that may delay driving cessation in older adults with dementia.

The family or social barriers might be, in part, the result of disparities of perceptions regarding driving between dementia drivers and family members. Different perceptions about driving may cause family conflicts, posing possible barriers to achieving driving retirement at the most appropriate time. Furthermore, family caregiving can befall anyone; most individuals are susceptible to the possibility of suffering dementia or becoming family caregivers. It is thus important to explore perceptions among the general public, with the expectation that the findings would provide implications for drivers with dementia and their family caregivers. In addition, it can be useful information to allow the public to better understand and get involved in addressing issues of driving and dementia. We therefore aimed to explore the perceptions of driving in a sample of the general population and examine the differences of perceptions from age and driving status viewpoints.

Design and methods

In October 2007, we conducted a survey among the general public aged 40 and over in Japan. Participants were selected from a research panel organized by Social Survey Research Information (SSRI) Co., Ltd. The

panelists, who were recruited from the general population and were willing to participate in surveys, included 31 050 persons aged 40 or over. Each person eligible for this panel was competent in reading and answering a series of self-administered questionnaires distributed by the SSRI; therefore, the quality of this research panel was assured and responses were valid and reliable. All panelists lived independently in communities. If we found that more than one panelist resided in the same household, we limited participation to only one member from that household. Of the 1191 who agreed to participate in this study, 1010 were randomly selected to fit into predetermined categories by a quota sampling method (Moser and Kalton, 1989). This quota sampling method has been used in previous studies (Arai Y *et al.*, 2005; Arai Y *et al.*, 2008). The quota controls used in the present study were gender, age group, driving license status, and place of residence (urban: population $\geq$ 500 000, suburban: 100 000 to $<$ 500 000 or rural: $<$ 100 000) based on Japan's national statistics. Although there were similar distributions of most of the sociodemographic characteristics compared with Japanese population statistics, there was a slightly higher proportion of study participants who lived in a household with two or more generations, had higher education, or were or used to be administrative workers.

Each subject received a self-administered questionnaire that requested information about sociodemographic factors (e.g., education, annual household income, employment status, and living arrangement), driving status (drivers: those who had a driver's license and frequently drove, and those who had a driver's license and rarely drove; non-drivers: those who did not have a driver's license), and perceptions related to driving.

Perceptions about driving

We asked all participants including drivers and non-drivers to identify how they perceived 'driving' using the following question based on a previous study by Perkinson *et al.* (2005): 'Do you think that driving is a "right" which we all deserve'? We also asked only the frequent drivers (i.e., those who had a driver's license and frequently drove) about possible barriers to driving cessation using the following question: 'Assuming you have to stop driving, what would be the reasons, if any, for your reluctance to do so'?

The former question was answered by a four-point Likert scale (agree, agree somewhat, disagree somewhat, disagree), while the latter was a multiple choice question in which participants chose all the answers that applied from 15 items created by the authors (a psychiatrist and public health specialist: YA and AA).

Statistical analyses

Multiple logistic regression models were used to compare the older group (65+ years) and younger group (40–64 years), and the drivers and non-drivers, on their perceptions of driving, adjusting for potential confounding factors such as age group/driving status, gender, place of residence, education, annual household income, living arrangement, and employment status. The associations between the probability of each reason for feeling reluctance to stop driving and the age group were evaluated by calculating the crude odds ratios (ORs) and the ORs adjusted for potential confounding factors, including gender, place of residence, education, annual household income, living arrangement, and employment status using the logistic regression models. All calculations were performed using SAS version 9.1.3 for Windows (SAS Institute Inc., Cary, NC).

Results

Table 1 shows the characteristics of the respondents ($n = 1010$) by age group and driving status. Most of the older drivers were men; further, the older age group had fewer years of education and lower annual household incomes than the younger age group. The younger drivers were more likely to be employed and lived in households with two or more generations present. The younger participants also tended to live in urban areas. Most of the drivers in both age groups frequently drove.

Regarding how the participants perceived 'driving', the largest number of older drivers agreed that 'driving is a "right" which we all deserve' (Table 2). Perceptions of driving did not significantly differ between the age groups. However, we found that the drivers tended to regard 'driving' as a deserved right compared with the non-drivers after controlling for potential confounders.

As shown in Table 3, 'It would be difficult for me to go out' (65.8% of the total) was the most common reason given for reluctance to stop driving among the frequent drivers, followed by 'It would be difficult for my family members to go out' (43.0%), 'Loss of something I enjoy' (29.2%), and 'A driver's license is

Table 1 Characteristics of participants by age group and driving status

	Older (65+ years)		Younger (40–64 years)	
	Drivers ($n=192$)	Non-drivers ($n=258$)	Drivers ($n=451$)	Non-drivers ($n=109$)
Men, *n* (%)	136 (70.8)	89 (34.5)	251 (55.7)	29 (26.6)
Age, mean (SD)	72.9 (5.3)	75.5 (6.1)	48.0 (6.5)	52.9 (8.0)
Education, *n* (%)[a]				
<10 years	49 (25.9)	78 (30.4)	12 (2.7)	8 (7.4)
10–<13 years	74 (39.2)	134 (52.1)	148 (32.9)	55 (50.9)
13+ years	66 (34.9)	45 (17.5)	290 (64.4)	45 (41.7)
Annual household income (thousands of Yen), *n* (%)[b]				
-<4000	75 (42.4)	103 (43.3)	47 (11.0)	33 (31.7)
4000–<8000	69 (39.0)	103 (43.3)	185 (43.4)	46 (42.2)
8000+	33 (18.6)	32 (13.5)	194 (45.5)	25 (24.0)
Employed, *n* (%)	53 (27.6)	25 (9.7)	355 (78.7)	54 (49.5)
Living arrangement, *n* (%)[c]				
Alone	10 (5.4)	27 (11.1)	7 (1.6)	6 (5.7)
Couple	95 (50.8)	84 (34.4)	56 (12.8)	34 (32.4)
Two or more generations in household	82 (43.9)	133 (54.5)	374 (85.6)	65 (61.9)
Place of residence, *n* (%)[d]				
Urban	58 (30.7)	84 (34.6)	249 (55.6)	51 (49.5)
Suburban	56 (29.6)	71 (29.2)	103 (23.0)	27 (26.2)
Rural	75 (39.7)	88 (36.2)	96 (21.4)	25 (24.3)
Frequently driving, *n* (%)	145 (75.5)	na	372 (82.5)	na

Missing data: six data points (a), 65 data points (b), 37 data points (c), and 27 data points (d).

useful as an ID card' (27.2%). The reason 'Loss of a motivating factor in my life' was significantly more common among the older drivers than among the younger drivers, even after adjusting for potential confounders. Moreover, compared with the younger drivers, the older drivers appeared to be concerned about 'Loss of something I enjoy' ($p=0.05$) and 'Loss of a hobby' ($p=0.08$) after driving cessation, although these reasons were not significant.

Discussion

The present study clearly demonstrated the disparities in perceptions about driving in a sample of the Japanese general public.

Perceptions about driving varied according to the respondent's driving status. Irrespective of age group, drivers tended to believe that driving was a deserved right, whereas non-drivers were less likely to think so. Further research is needed regarding why the difference in perceptions existed. These different perceptions are nonetheless thought to be a cause of possible conflicts among family members or stakeholders; those drivers who perceive driving as a right may firmly refuse to give up driving or even rigidly adhere to continuing to drive. These results also indicate that drivers and non-drivers may have a different understanding of 'driving'. Therefore, it is necessary for the general population, irrespective of driving status, to promote a more precise recognition of current driving license regula-

Table 2 Perceptions of driving among the general public

	Older (65+ years)		Younger (40–64 years)		*p* value[b] (adjusted for potential confounding variables)	
	Drivers ($n=192$)	Non-drivers ($n=257$)[a]	Drivers ($n=449$)[a]	Non-drivers ($n=109$)	Older *vs.* younger	Drivers *vs.* non-drivers
'Driving is a "right" which we all deserve'					0.7462	0.0009
Agree/Agree somewhat, *n* (%)	147 (76.6)	146 (56.8)	311 (69.3)	72 (66.1)		
Disagree somewhat/Disagree, *n* (%)	45 (23.4)	111 (43.2)	138 (30.7)	37 (33.9)		

[a]One missing data point for the older non-drivers and two missing data points for the younger non-drivers.
[b]Calculated by multiple logistic regression model including age group/driving status, gender, place of residence, education, annual household income, living arrangement, and employment status.

Table 3 Possible reasons for reluctance to stop driving among frequent drivers (multiple answers)

Reason	Older drivers (65+ years, $n=144$)[a]	Younger drivers (40–64 years, $n=370$)[a]	Older *vs.* younger drivers	
	n (%)	*n* (%)	Crude OR	Adjusted OR[b]
I am not reluctant to stop driving	22 (15.3)	51 (13.8)	1.13	1.64
It would be difficult for me to go out	90 (62.5)	248 (67.0)	0.82	0.88
It would be difficult for my family members to go out	59 (41.0)	162 (43.8)	0.89	0.87
Loss of something I enjoy	56 (38.9)	94 (25.4)	1.87*	1.81
Loss of independent living	39 (27.1)	81 (21.9)	1.33	1.10
A driver's license is useful as an ID card.	38 (26.4)	102 (27.6)	0.94	1.16
Loss of a motivating factor in my life	28 (19.4)	30 (8.1)	2.74*	4.93*
Loss of a way to relax	21 (14.6)	43 (11.6)	1.30	1.85
Loss of a hobby	20 (13.9)	32 (8.7)	1.70	2.44
Loss of a sense of self	20 (13.9)	43 (11.6)	1.23	0.91
I want to keep my driver's license	18 (12.5)	38 (10.3)	1.25	0.77
Loss of my dignity	15 (10.4)	29 (7.8)	1.37	1.31
Loss of something I commit to regularly	14 (9.7)	22 (6.0)	1.70	2.02
Loss of an opportunity to be alone	8 (5.6)	22 (6.0)	0.93	2.06
I don't know how to return my license	0 (0.0)	0 (0.0)	—	—

[a]One missing data point for the older drivers and two missing data points for the younger drivers.
[b]Odds ratio (OR) was adjusted for gender, place of residence, education, annual household income, living arrangement, and employment status by multiple logistic regression model.
*$p < 0.05$.

tions to close the perception gap and for the sake of public safety.

Our study also showed that among the frequent drivers in both older and younger groups, most of the reasons for reluctance to stop driving were related to the possible loss of personal mobility (shown in Table 3). Our finding partly supports Freund's view (Freund and Szinovacz, 2002) in which decisions to stop driving were associated not only with competence but also with the availability of alternate transportation opportunities. In addition, a previous study regarding family caregivers of dementia patients by Mizuno *et al.* (2008) showed that family caregivers cited alternative transportation, and in particular the availability of family caregivers or other family members who could drive instead of the patient, as essential to facilitate the cessation of driving. It has also been reported that the availability of transportation services was a key factor in allowing older people to keep attending social activities and maintain autonomy (Roper and Mulley, 1996; Dickerson *et al.*, 2007; O'Neill, 2007). It is clear that alternate transportation is needed to facilitate the smooth transition to another form of transportation after driving retirement and prevent older people from experiencing restricted mobility. Although availability of a mass transit system varies between rural and urban areas in Japan, a bus or community bus (one that circles around the area) has been developed as a practical form of transportation to enhance the mobility of the residents and is expected to support those who have stopped driving as well as their family members.

We found a significant difference between the older and younger age groups with respect to the reasons for reluctance to stop driving. The older drivers were more likely to value the qualitative aspects of driving, for example, driving as 'a motivating factor in my life', 'something I enjoy', and consider a 'hobby'. It appears that driving is regarded not only as a mode of transportation but also as a meaningful activity for older drivers. This might be related to the findings of another study in which 93% of drivers diagnosed with dementia ($n=43$) thought that driving was important to their quality of life (Adler and Kuskowski, 2003). Both practical and qualitative aspects of driving can be important factors in maintaining independence among older people.

These noticeable reasons for reluctance to stop driving may be related to the negative consequences of driving cessation among older people or people with dementia cited in previous reports: increased depressive symptoms (Marottoli *et al.*, 1997; Fonda *et al.*, 2001; Ragland *et al.*, 2005), decreased out-of-home activity levels (Marottoli *et al.*, 2000), difficulties in accessing social and recreational services (Taylor and Tripodes, 2001), and increased risk for entry into a nursing home (Freeman *et al.*, 2006). We therefore suggest that more attention be devoted to not only the problem of decreased mobility but also alternatives to the qualitative aspects of driving. One possible

alternative would be to increase opportunities for participating in leisure, physical, and social activities and social services, which could help older people find something else to 'motivate them in their lives', 'enjoy', and have as a 'hobby' after driving retirement. Moreover, to seek appropriate alternatives for individuals, family members, and stakeholders should communicate with the older drivers early in the process of driving cessation to try to better understand what 'driving activity' means for them.

The limitations of this study should be noted. Although our study sample was selected from a research panel based on national statistics using a quota sampling method, a certain amount of selection bias was unavoidable. In addition, we categorized the respondents into two groups of driving status: drivers and non-drivers. However, we did not know if the non-drivers group included former drivers who had returned a driver's license and stopped driving. A self-administered questionnaire, as used in this study, can represent another information bias. Perceptions about driving were not sufficiently explored by the closed-ended format in the questionnaire; thus, the results should be carefully interpreted. We did not take into account in the analyses whether the licensed drivers had other drivers to provide transportation. Instead, we used living arrangement as a confounding factor related to the availability of alternate drivers that could be controlled in the analyses.

Despite these limitations, our findings provide useful insights into the possible family or social barriers to driving cessation in the case of drivers with dementia. As observed in the present study, the disparities in perceptions about driving may cause conflicts among stakeholders with respect to when dementia patients should have their licenses revoked. It is thus important to facilitate general public involvement in considering the public health issue of driving and dementia, closing the perception gap and developing strategies to better address the difficulties related to driving cessation as a whole society. Moreover, in addition to practicable transportation alternatives, the qualitative aspects of driving should also be paid more attention when preparing alternatives. In this way, the goal of more effectively meeting the needs of retiring drivers while also allowing them to maintain autonomy can be more easily achieved.

Conflict of interest

None known.

Key points

- The drivers among the general public that participated in this study tended to highly agree that 'driving is a "right" which we all deserve', compared with the non-drivers.
- The most common reason given for reluctance to stop driving among frequent drivers was the loss of personal mobility; further, older drivers were more likely than younger drivers to value the qualitative aspects of driving.
- Disparities in the general public's perceptions about driving may present possible family or social barriers to driving cessation in the case of drivers with dementia.
- It is suggested that not only mobility but also the qualitative aspects of driving be paid more attention when developing alternatives to driving.

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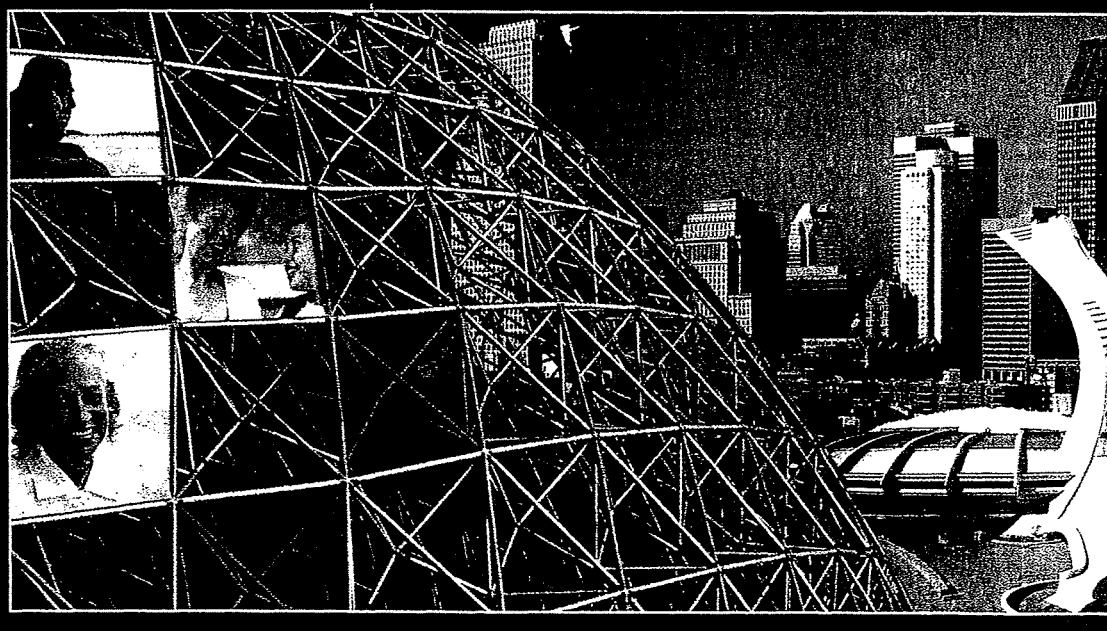

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answer the debate about the validity of road testing, as well as the value of neuropsychological test predictors.

SO8.2

Sleep medication, antidepressants and traffic safety in the elderly: Evidence from on-the-road driving studies in real traffic

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Depression and insomnia often occur in the elderly and may significantly affect their quality of life. Driving a car is an important way in which elderly preserve their independence and facilitate social contact. However, the pharmacological treatment of depression and insomnia may negatively impact driving ability and thus compromise traffic safety.

Many hypnotics and antidepressants have been examined applying the on-the-road driving test in real traffic. In this test, subjects are instructed to drive a car over a 100 km public highway while maintaining a constant speed and steady lateral position. The Standard Deviation of Lateral Position (SDLP), i.e. the weaving of the car, is the primary parameter of the test.

Benzodiazepines are the traditional pharmacological treatment for insomnia. There is considerable evidence that benzodiazepines significantly impair driving ability. Epidemiological studies confirm that traffic accident risk is significantly increased in patients who are treated with benzodiazepines. In terms of traffic safety, zopiclone, a non-benzodiazepine hypnotic, shows no advantages over benzodiazepines. Zolpidem and zaleplon (both non-benzodiazepines) do not impair driving when used as recommended. Tricyclic antidepressants (TCAs) such as amitriptyline, doxepine and imipramine comprise the traditional pharmacological treatment of depression. Unfortunately, driving is significantly impaired after treatment onset. After daily use of TCAs, tolerance develops slowly. In contrast, SSRIs (including fluoxetine, paroxetine and escitalopram) and related antidepressants (e.g., venlafaxine) do not impair driving.

Several factors may interact with the effects of drugs on driving, including normal cognitive decline during aging, the effects of insomnia and depression itself on driving, and the presence or absence of co-morbid disorders. The impact on driving further depends on various drug-related factors such as the administered dose, half-life, time between intake and driving, duration of treatment (tolerance), gender, and individual differences.

Up to now, most driving studies were performed in healthy adults. Therefore, further studies of drug effects in elderly patients are necessary. Pharmaceutical companies should focus on developing new drugs with alternative mechanisms of action, aiming at less sedation.

SO8.3

Epidemiological findings of drivers with dementia and new legal systems in Japan

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Recent studies and newspaper articles have reported that not a few individuals with dementia are still driving automobiles in Japan, causing a threat against other drivers and pedestrians. To further understand the present situation of dementia drivers in Japan, we sent a structured questionnaire to the members of the Japanese Psychogeriatric Society and those of the Japan Academy for Alzheimer's Disease. The questionnaire was distributed to 368 experts who agreed to participate in this survey (8%) with written informed consent. The subjects were 7329 outpatients with dementia who visited these experts' clinic during the consecutive three months. Seven hundred and seventy-eight patients (11%) were driving at the time of the survey, 36% among them everyday and 33% several days per week. The purposes of their driving were visiting hospital (39%), shopping (24%), social and recreational activities (18%), and work (14%). Approximately 1/3 of caregivers (34%) worried about the patient's driving and considered it dangerous, and 31% of caregivers had tried to stop it. On the other hand, only 2% of drivers with dementia had been forced to quit driving by the police/government. Not a small percent (16%) of drivers with dementia caused car accidents. In Japan, the Road Traffic Act was revised in 2008 and determined that elderly persons over 75 years of age are required to undergo a cognitive screening test on renewal of their driver's license. Those applicants whose scores are below the cut-off point of this cognitive screening, and who, in addition, have predetermined traffic violation records during the past year, would be referred to a medical expert. Once the diagnosis of dementia is determined, the Public Safety Commission holds the applicant's license accordingly. Because the Act will be valid from June 2009, we will discuss the situation of drivers with dementia in Japan under this new Act.

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認知症患者の運転：社会支援の必要性

荒井 由美子, 新井 明日奈, 水野 洋子

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＜索引用語：認知症，社会支援，運転，家族介護，街づくり＞

I．はじめに

認知症に罹患した高齢者が，安全に自動車運転を継続することは不可能であり，いずれは自動車運転を中止する状況となることは必至である．しかし，運転中止は，高齢者本人とその家族介護者にとって，多大なる困難を生ずるものである．したがって，運転中止を円滑に進め，高齢運転者本人と公共の安全を確保するためには，認知症高齢運転者とその家族介護者に対する具体的な社会支援策を早急に構築する必要がある．

われわれは，長寿科学総合研究事業（厚生労働省）（H 19-長寿-一般-025）の一環として，認知症高齢者とその家族介護者に対する支援策のあり方を検討することを企図し，全国の一般生活者を対象に高齢者及び認知症高齢者の自動車運転に関する意識調査を実施した．本稿では，この意識調査の概要を紹介する．

II．一般生活者を対象とした意識調査：目的と方法

II-1　意識調査の目的

本調査では，高齢者及び認知症高齢者の運転に関する，一般生活者の認識を明らかにし，認知症高齢者の運転中止を円滑に実行するための社会支援のあり方を検討することを目的とした．

II-2　意識調査の方法

本調査は，全国の一般生活者（40歳以上の一般生活者1,191名）を対象として，郵送法にて配布した自記式質問票により行われた．質問項目は，基本属性のほか，運転状況，認知症患者の運転に係る法制度の知識と安全性に関する認識，公共交通機関の利用状況，運転免許証の自主返納に関する意識等である．また，普段運転している者（以下，「運転者」とする）に対する質問項目としては，運転中止に関する意識等，さらに，普段運転していない者あるいは運転免許非保有者（以下，「非運転者」とする）に対しては，自動車に同乗する状況等を尋ねた．

集計後，居住地の人口規模，性，年齢層，免許保有状況の層別に回答の傾向を分析した．

III．結　　果

III-1　対象者

有効回答数は1,010名（男性505名，女性505名；回答率84.8％）であり，年齢層別では，40～49歳で347名，50～64歳で213名，65～74歳で226名，75歳以上で224名であった．

III-2　高齢者・認知症患者の自動車運転：法制度についての知識

道路交通法における，高齢者・認知症患者の運

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