

Epilepsy and Driving in Japan

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Summary: *Purpose:* The driving regulations in Japan were amended in 2002, which lifted the absolute ban on driving by persons with epilepsy (PWE) and granted licenses to PWE after a 2-year seizure-free period.

Methods: To survey the effect of the new driving regulations, we sent questionnaires both to the driving authorities (DAs) and to doctors of the Japan Epilepsy Society (JES).

Results: Around 1,400 PWE legally obtained a driving license within 1 year after the amendment, licenses were rejected in 157, and 61 had the license withheld for <6 months. In most cases, the attending doctor assessed fitness for driving; 171 doctors responded to the questionnaire. One third of them commented on a positive change in attitude of PWE with respect to driving. Their main remarks included the need to shorten the seizure-

free period to qualify for fitness to drive and the need for special guidelines for conditions such as rare seizure occurrence, recently diagnosed epilepsy, or reflex epilepsy. Problems of assessment identified included difficulty in deciding the time for reassessment, distress of PWE over cancellation of license, cost of the assessment, responsibility of the assessing doctors in case of seizure recurrence, and protection of privacy. They requested the DAs to promote publicity about the information and asked the JES to establish a guideline for assessing fitness to drive.

Conclusions: The results highlighted the need for cooperation between the DAs and the JES for further amendment of the regulations as well as the importance of education for the public, patients, and professionals. **Key Words:** Driving regulations—Driving license—Epilepsy—Japan—Asia—Oceania.

The driving license is the most common credential not only for leisure and commuting, but also for finding a job, regardless of its actual use in the job. The latter is especially important at times like today when the unemployment rate is high, and in districts where transportation means other than the automobile are not well developed. Disqualifying patients with a certain disease from driving increases their social handicaps.

In Japan, persons with epilepsy (PWE) had been absolutely banned from driving since 1960. However, a considerable number of PWE had held a driving license illegally (concealing the status of epilepsy) and actually had driven a motor vehicle. Research on the actual conditions had prompted the medical community to submit recommendations to the authority, and some flexibility had been shown with regard to issuing driving licenses to PWE. Finally, the following new driving license regulations came into effect in June 2002:

1. A person with chronic epilepsy may be granted a driving license after a seizure-free period of 2 years.
2. A person with simple partial seizures that would not impair driving safety may be granted a driving license if no other seizures that might impair driving safety have occurred over a period of ≥ 1 year.
3. A person with seizures occurring only in sleep may be granted a driving license if no waking seizures have occurred over a period of ≥ 2 years.
4. If these requirements are going to be met within 6 months, the license will be withheld for <6 months.
5. A person with epilepsy is recommended to apply for a license to drive heavy and/or public vehicles only after a seizure-free period of 5 years without medication.

Appendix: For the assessment of fitness to drive, a certification by the doctor in charge or a qualified epileptologist is required.

We surveyed the effect of these new driving regulations by sending questionnaires both to the driving authorities and to doctors of the Japan Epilepsy Society (JES) in June 2003. In this article, the results of the survey are reported along with a brief outline of the historical

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situation of driving licenses and driving for PWE in Japan.

METHODS

Two different questionnaires were sent to (a) the driving authorities and (b) to doctors of the JES in June 2003, aiming to survey the effect of new driving regulations.

The driving authorities of the police agency were asked to provide the numbers of PWE who applied for or renewed the driving license in the 12 months after amendment of the regulations and the results of their judgments. They were also encouraged to list the problems related to enforcement of the new regulations. The central driving authority was requested to summarize the results of the questionnaires from 51 branches covering the whole country.

The 1,218 doctors who had been members of the JES for >5 years were surveyed. The questionnaires contained items such as the number of certifications concerning driving licenses issued in the 12 months after amendment of the driving regulations, changes of attitudes of the PWE, problems related to the new regulations, and suggestions to improve the situation.

RESULTS

Questionnaires to driving authorities

The driving authorities of the police agency provided the data for the whole of Japan. There were 2,634 PWE who applied for a new license or renewal of an existing license within 12 months after amendment of the regulations. Among them, 2,508 PWE reported spontaneously to the authorities about their epilepsy. The authorities granted a license to 1,399 PWE, rejected the applications of 157 PWE, and withheld the licenses of 61 PWE for <6 months. The outcome of the remaining PWE was unknown. They probably gave up applying or renewing their license after consultation with driving authorities or failed to pass the examination. Of 1,399 license-eligible PWE, 968 were evaluated as "reassessment unnecessary," and 431 were recommended to repeat assessment in 1 to 5 years, most often in 3 years (191 PWE).

In most cases, the attending doctors assessed fitness for driving. Consultants engaged by the driving authorities took part in the assessment in 5% of the applications.

The driving authorities noticed that the applicant had epilepsy on the occasion of renewal of license (40%), consultation before applying for a license (27%), new application (26%), and others (7%).

The driving authorities identified some problems in enforcing the regulations, including difficulties in identifying the medical conditions, lack of precise description in the assessment of attending doctors, difficulties in obtaining cooperation of attending doctors and/or PWE, and length of time for assessment procedures.

Questionnaires to doctors

Responders to the questionnaires totaled 171 doctors with a mean age of 51 years (range, 33–77 years). Fifty-five doctors actually assessed 162 PWE in 1 year, and 19 doctors took part in the assessment as consultants engaged by the driving authorities.

Fifty-one doctors commented on a change in attitude or perception of PWE with respect to driving or obtaining a driving license. They found a positive attitude of PWE with respect to job finding, self-responsibility, and compliance. PWE were more active in getting information on licenses and in obtaining licenses on informing the authorities of their condition. However, 50 doctors indicated no change of attitude of PWE. They commented that PWE were not yet well informed about the changes of the regulations and that a considerable number of PWE were still hesitant to declare their epilepsy.

The problems relating to the new regulations were classified into five categories: medical guidelines (60 responses), education (50 responses), legal responsibility of assessing doctors (41 responses), assessment system (32 responses), self-declaration system (14 responses), and others (15 responses).

1. Medical guidelines

The regulations grant the license unconditionally only if there is no worry about seizure recurrence. Otherwise, reassessment is required after a certain period indicated by the doctor. Twenty-one responses expressed the difficulty of determining the period for reassessment.

There were 19 responses against the 2-year driving ban. They expressed the need to shorten the seizure-free period to qualify for fitness to drive and the need for special guidelines for conditions such as rare seizure occurrence, recently diagnosed epilepsy, and reflex epilepsy.

Eleven responses mentioned the distress of PWE over cancellation (instead of withholding) of driving license because they were assessed as unfit to drive (license is cancelled when the PWE is assessed as unfit to drive for >6 months). Nine responses indicated that the regulations were too complex and difficult to practice.

2. Education

The need for educating PWE and their related persons (27 responses), doctors (eight responses), general public (six responses), police agency (four responses), and driving authorities (five responses) was emphasized for better understanding of the regulations as well as epilepsy.

3. Legal responsibility

Concern for the responsibility of the assessing doctors in case of seizure recurrence was expressed by 37 respondents. Concern also was expressed over responsibility when the assessment was made based on falsely declared information by PWE (four responses).

4. Assessment system

Seven respondents would like to get extra pay for assessment, and five respondents complained of the burden of assessment as extra work. Seven respondents indicated the difficulty of assessing PWE who visited for the first time. Six respondents recommended the assessment to be made by the attending doctor, whereas the importance of assessment by epileptologists was emphasized by seven respondents.

5. Self-declaration

Ten respondents raised a concern that the self-declaration system might result in inaccurate determination of seizures. However, four respondents pointed out that declaration of epilepsy is still a major disadvantage.

6. Others

Nine respondents expressed the concern for the leakage of private data. They also were worried about the insurance issue. Six respondents recommended reevaluation of this assessment system after some years.

As actions for improving the situation, recommendations were made either to the police agency (59 responses) or epilepsy society (35 responses) or both.

The police agency should publicize the data on the accident rate involving PWE (32 responses), the number of licenses obtained by PWE, and the judgments after assessments (eight responses). Five respondents recommended inviting more epileptologists to the assessment.

Conversely, the JES was encouraged to draw up assessment guidelines or manuals (20 responses) and to promote research on the actual conditions of driving by PWE (five responses). Research to provide evidence for compliance with treatment and for the risk of recurrence after a seizure-free period of 2 years also should be initiated (five responses). The Society should train more physicians to increase the number of epileptologists for assessment (two responses). Car insurance of PWE also should be studied (two responses).

Eight respondents emphasized the need for mutual communication between driving authorities and the epilepsy society.

DISCUSSION

To provide a background for this article, a brief sketch of the situation of driving licenses and motor vehicle driving for PWE in Japan is described.

The Road Traffic Act that was enforced in 1960 absolutely prohibited PWE from driving a motor vehicle. An additional law came into effect in 1967. This law required a medical certification when applying for a driving license asserting that the applicant did not have epilepsy. However, the law caused so much confusion including the change of doctor, mistrust between patient and doctor, and

noncompliance, that this additional law was repealed after 11 months.

In 1979, a judicial precedent was established for an interpretation of the Road Traffic Act depending on the medical state. According to this precedent, a person did not come under the Act when his or her seizure had been controlled for a sufficiently long time.

The authorities in charge of traffic regulations acknowledged in 1993 that the legal status of epilepsy was to be judged by a medical doctor. From around that time, the driving license regulation in Japan became more flexible and realistic as regards issuing driving licenses to PWE.

In 1998, 74 million automobiles and 72 million driving license holders existed, which was 68.6% of the population older than 16 years. However, it is not easy to obtain a driving license in Japan. A person who wants to obtain a driving license has to pass a difficult paper test and a tough road test after attending a very expensive driving school. On average, it takes ≥ 1 month to pass the tests and costs $> \$3,000$ U.S. In 1998, the pass rate of the examination was 63%. Furthermore, the license must be renewed every 3 to 5 years after an aptitude test. Therefore patients with serious medical condition may not pass the examination.

Driving license holders with epilepsy

A considerable number of PWE actually had held a driving license, although illegally (Table 1). According to the survey by Wada in 1967 (1), 719 or 19% of 3,806 PWE were holding a driving license at the time of the survey, and another 156 or 4% had a driver's license in the past. A retrospective study of Yamahana et al. in 1972 (2) revealed a driving license-holder rate of 18% in the PWE population, and only 37% of the holders were seizure-free for > 3 years. A survey of the JES in 1985 (3) reported that 23% of 2,644 PWE older than 16 years had a driving license, and 67% of the license holders were actually driving. More than 50% of all respondents expressed the need to obtain a driving license. Hashimoto (4) retrospectively investigated 255 PWE aged 16 to 60 years attending a clinic in a rural area of Japan in 1989. Of 112 license holders (44%), 94 actually drove, and 37 (33% of license holders) still had seizures. Hashimoto et al. (5) performed a follow-up study on 99 license holders with epilepsy (LHE) for 2 years and found that 23 still had seizures, and 83 actually drove.

In a prospective 1-year survey initiated by JES (1992), 1,713 of 3,522 PWE (ages 20–50 years) or 48.6% had a driver's license, and 80% of LHE actually drove motor vehicles (6). Only 855 (50% of LHE) had no seizures for > 3 years. Only 57% of seizure-free PWE for > 3 years had a license.

A recent population-based retrospective study in a rural district of Japan in 2000 (7) revealed that 81 (54.7%) of 148 persons (ages, 20–38 years) with epilepsy onset before

TABLE 1. *Driving license holders with epilepsy*

Investigators	Year	N	LHE	Percentage of LHE seizure-free	Percentage of seizure-free PWE holding licenses	Control
Wada	1967	3,806	19%			
Yamahana et al.	1972	220	18%	37% (3 yr)		
Epilepsy Association	1985	2,644	23%			
Hashimoto	1989	255	44%	67% (3 yr)		60%
Hashimoto et al.	1990	99	—	77% (2 yr)		
Takeda et al.	1992	3,522	49%	50% (3 yr)	57% (3 yr)	79%
Wakamoto et al.	2000	148	55%	80% (5 yr)	74% (5 yr)	95%

LHE, license holders with epilepsy; PWE, persons with epilepsy; Control, age-matched population.

age 16 years had a driving license. Among them, 16 (20%) patients did not have a remission period of 5 years.

As such, the percentage of driving license holders in the PWE population has increased. Takeda et al. (6) reported that the license-holding rate tended to be lower with increasing frequency of seizures; the rate was highest among those with seizures controlled for 3 years (57%), and it was lowest among those with seizures occurring monthly (33.2%) or weekly (31.9%). The situation that nearly one third of PWE with monthly or weekly seizures held a driving license was medically and socially unacceptable. Conversely, only 57% to 74% of seizure-free PWE for 3 to 5 years had a driving license. This rate was much lower than that of the age-matched general population (Table 1).

Accidents that involved PWE

According to the report of Wada (1), 28 (3.9%) of 719 LHE experienced traffic accidents in a year (Table 2), and five of the 28 accidents were caused by seizures. In other words, the accident rate due to seizures was 0.7 per 100 license holders per year. Yamahana et al. (2) reported that 9.7% of LHE had traffic accidents during a 3-year period, 16% of which (1.6% of LHE) were seizure related.

According to the study of Japan Epilepsy Association (3), 16.2% of LHE experienced seizures while driving a vehicle in their lives. In the study of Hashimoto (4), accidents were reported in 27% of 112 license holders in their past, and 26% of the accidents (7.1% of LHE) were seizure related, with one accident involving personal injury. One accident was reported in 1 year of investigation. In the prospective study of Hashimoto et al. (5), accidents

occurred in seven (7%) of 99 LHE in 2 years, but none was seizure related. One accident (0.5% per year) was reported to the police. This rate was half of that reported to the police in the general population.

In the survey of the JES (6), 127 traffic accidents occurred in a year (7.4% of LHE), 28 of which were related to epileptic seizures (1.6% of LHE). However, the accident rate in the group with seizures controlled for >3 years was significantly lower (5.3%) compared with the group with uncontrolled seizures (9.6%). Fifty accidents resulted in personal injuries (2.9% of LHE), 17 of which were seizure related (1% of LHE). This figure was higher than that of general population (~1.1% of license holders: 695,345 personal injuries per 64.172 million license holders in 1992), although the accident rate of seizure-free LHE would have been much lower. Wakamoto et al. (7) reported one accident in 81 LHE in their past.

Medical recommendation

Based on the results of the survey of the JES (6), the Society recommended that the driving license regulation law in Japan should be amended to conform to the more realistic regulations in Western countries. For more realistic application of the law, the Commission on Legal Affairs (Driver's Licenses) of the JES submitted the following recommendations to the authorities in charge of traffic regulations in 1992 (8).

1. Persons with epilepsy who have been free from seizures for 3 years without medication should be free from license restrictions.
2. Those who have no seizure for >3 years while taking medication should be permitted to hold a driving license, provided that they are taking drugs regularly and are compliant with the doctors in charge of their conditions.
3. Those who are receiving medical treatment should not be permitted to drive heavy and/or public vehicles.

These recommendations had gradually permeated the medical community. Doctors were able to advise the patients to wait until epilepsy had remitted for 3 years. Conversely, the very rule that required freedom from seizures

TABLE 2. *Traffic accidents in license holders with epilepsy*

Investigators	Year	LHE	Accidents ^a	Seizure related
Wada	1967	719	3.9%/yr	0.7%/yr
Yamahana et al.	1972	41	9.7%/3 yr	1.6%/3 yr
Epilepsy Association	1985	665		
Hashimoto (retrospective)	1989	112	0.9%/yr	
Hashimoto et al (prospective)	1990	99	7%/2 yr	0/2 yr
Takeda et al (prospective)	1992	1,713	7.4%/yr	1.6%/yr
Wakamoto et al.	2000	81		

^a Accidents involving either property damage or personal injury or both.

for 3 years had become a burden for some patients with a shorter seizure-free period who were fit to drive on medical grounds, such as those with known timing of seizure occurrence, known provocative factors, or excellent outcome after surgery. The rule of banning driving for a 3-year seizure-free period was a provisional agreement, and no medical basis existed to uphold this rule further (9).

On the occasion of the 3rd Asian & Oceanian Epilepsy Congress in New Delhi, a symposium entitled "Epilepsy and Driving: Regional Aspects and Problems" was held on November 13, 2000. Six speakers (Dr. Meena Gupta from India, Dr. Shih-Hui Lim from Singapore, Dr. Jing-Jane Tsai from Taiwan, Dr. Park Chong Cheul from South Korea, Dr. Yushi Inoue from Japan, and Dr. Andrew Black from Australia) reported the situation in each country. After discussing the problems, the symposium participants including Dr. John Kirker, Chairman of the Commission on Driving Regulations of the International Bureau for Epilepsy, agreed to recommend guidelines that should form the basis for the regulation of driving for PWE. (See Appendix: Recommended Principles for the Assessment of Fitness to Drive in People with Epilepsy, Asian & Oceanian Epilepsy Congress, New Delhi, November 2000).

Strongly influenced by these Asian-Oceanian guidelines, the Commission on Legal Affairs of the JES revised the recommendations as follows, and submitted them to the authorities in 2001 (10).

1. A person with chronic epilepsy may be granted a driving license after a seizure-free period of 2 years.
2. A person with recently diagnosed epilepsy may be granted a driving license if he/she has remained seizure free in the first 12 months after starting treatment.
3. A person with simple partial seizures that would not impair driving safety may be granted a driving license if no other seizures that may impair driving safety have occurred over a period of ≥ 1 year.
4. A person with seizures occurring only in sleep may be granted a driving license if no waking seizures have occurred over a period of ≥ 2 years.
5. Driving should be prohibited during withdrawal of medication and for 3 months after withdrawal, except in special cases.
6. After an isolated seizure, if the triggering factors are no longer in existence, a person may be granted a driving license after 3 to 6 months.
7. A PWE or with an isolated seizure may be granted a license to drive heavy and/or public vehicles only after a seizure-free period of 5 years or 2 years, respectively, without medication.

New regulations

The National Police Agency of Japan proposed a draft amendment of the Road Traffic Act in December 2000. The draft stated that PWE would not be eligible to re-

ceive a driving license. In protest against this proposal, many epilepsy organizations and individuals both from Japan and abroad sent their opinions to the National Police Agency. This action prompted the National Police Agency to revise the draft of the Road Traffic Act. The revised Act now fundamentally, although partially, adopts our medical recommendations.

Situation 1 year after new regulations

The survey conducted 1 year after enactment of the new regulations revealed that 1,400 PWE legally obtained the driving license. This figure is, however, very small compared with the considerably higher percentage of LHE in the past surveys. A considerable number of PWE must have obtained licenses without informing the authorities of their conditions. Some PWE and even some doctors were not aware of the change of regulations as indicated by one third of the doctors' responses, but some PWE might be unwilling to declare their epilepsy to the authorities for fear of losing a job or other negative effects. This figure may change with time, as one third of doctors found positive changes of PWE in their attitude to obtaining driving license, job finding, self-responsibility, and compliance. The survey will be repeated in the near future to clarify the change.

Licenses were rejected in 157 PWE. Because the license may be withheld for a maximum period of 6 months, the license will be cancelled if the PWE had seizures within 18 months before reapplication. Cancellation of an existing license causes a serious problem, because all the procedures and tests to obtain the license have to be restarted, which is costly and time consuming. Many doctors argued that the license should be allowed to be withheld for a longer period.

The driving authorities pointed out a lack of precise description in doctors' assessments. This reflects the difficulty of determining the period for reassessment, which also implies the doctors' concern over the legal responsibility in case of seizure recurrence. The PWE who want to have a license may not provide precise information. Furthermore, the concern for confidentiality might also complicate the situation. These problems should be solved through dialogues between medical and judicial professionals and driving authorities.

The driving ban of 2 years from the last seizure for all kinds of epilepsy was a point of counterargument. Some doctors advocated the need to shorten the seizure-free period to qualify for fitness to drive. Many countries have shorter a seizure-free period for granting license to PWE, and several recent reports also provided evidence to support this direction (11,12). There should also be special regulations for different conditions such as rare seizure occurrence, recently diagnosed epilepsy, and reflex epilepsy, as recommended by the JES in 2001.

The second most frequent responses of doctors concerned education. The importance of providing appropriate information not only to PWE and their related persons, but also to doctors, driving authorities, and people in general was emphasized. The survey revealed that a large proportion of the assessments for fitness to drive were made by the attending physicians of the PWE. This fact indicates the importance of involving the doctors who are treating PWE in the educational programs of epileptology. Dialogues between driving authorities and the epilepsy society also were recommended. The driving authorities should publicize the data on driving and epilepsy, and the epilepsy society should provide various medical information including assessment guidelines.

The epilepsy society was asked to promote research to gather evidence such as the actual condition of driving by PWE, compliance with treatment, and risk of recurrence after the 2-year seizure-free period. The tasks of the epilepsy society include also to increase the number of epileptologists who should assess fitness to drive appropriately.

Several problems and tasks have already been identified. We have made a first step forward after 42 years of an absolute driving ban for PWE. The second step will be actions for further amendment of the regulations.

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APPENDIX

Recommended Principles for the Assessment of Fitness to Drive in People with Epilepsy, Asian & Oceanian Epilepsy Congress, New Delhi, November 2000

1. The diagnosis of epilepsy should not of itself result in a driving ban.
2. A person with chronic epilepsy (i.e., whose seizures have continued despite treatment) may be granted a driving license after a seizure-free period of 1 to 2 years.
3. A person whose epilepsy is of recent onset, if seizure free in the first 6 to 12 months after starting treatment, may resume driving or be granted a driving license.
4. After an isolated seizure, if no cause is established (i.e., with negative imaging studies and negative EEG), a person may resume driving or be granted a driving license after 3 to 6 months.
5. Seizures occurring only in sleep and certain "safe" seizures (i.e., those that would not impair driving safety) require the establishment of a pattern in which no waking seizures that might impair driving safety have occurred over a period of ≥ 1 to 2 years before a driving license may be granted. A Specialist Consultant assessment and opinion are recommended in such cases.
6. An additional item for consideration. A licenseholder fulfilling the criteria above who has a recurrent seizure should cease driving for 3 to 6 months. A Specialist Consultant review is recommended.
7. Much stricter criteria must apply before consideration of the granting of a license to drive commercially.

Notes

1. Mandatory reporting is undesirable.
2. An appeals procedure should be instituted.
3. Where possible, a specialist medical advisory panel should be available.
4. The recommended guidelines should be widely publicized.

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