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Clinical Study

Impact of New Regulations On Assessing Driving Status (INROADS): A South Australian seizure clinic cohort

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ABSTRACT

The ability to drive is important to patients and driving restriction often leads to restriction of employment and social opportunities. In March 2012, Austroads released revised Assessing Fitness to Drive Guidelines (AFTDG) with significant changes for drivers with seizures and epilepsy. Our study aimed to assess the impact of the 2012 AFTDG on a Seizure Clinic cohort compared to the previous 2003 AFTDG and an individual's current driving status. We also aimed to quantify the difference in AFTDG interpretation between expert and non-expert doctors. We performed a retrospective observational audit of case notes for all patients managed in a public hospital outpatient Seizure Clinic between 1 March 2010 and 1 March 2012. A total of 142 patients were included in the analysis. Comparison between the 2003 and 2012 AFTDG resulted in reduced eligibility to drive a private vehicle by 2.1% (52.5% *versus* 50.4%) and commercial vehicle by 2.2% (4.5% *versus* 2.3%). The proportion of those currently driving against guideline recommendations increased (private 8.8% *versus* 19%; commercial 50% *versus* 100%) and the non-expert assessor was more likely to agree with the experts with the 2012 AFTDG. In summary, the 2012 AFTDG has had a measurable impact on driving eligibility in individuals with seizure although it is easier to interpret for non-expert doctors. Greater awareness of the 2012 AFTDG is required to reduce the proportion of patients driving against current recommendations.

1. Background

The ability to drive is the listed as the most or second most important concern by people with epilepsy [1,2]. Inability to drive leads to limitation of social and employment opportunities, impaired quality of life, and social stigma, especially in societies with limited public transport and high social expectation that a person should drive.

Many medical conditions may impact on the ability to drive safely. South Australian data reveal at least 11% of motor vehicle accidents resulting in a presentation to hospital are associated with a medical condition, with 17% of these attributed to seizure [3]. Epilepsy and seizure are particularly difficult to assess regarding crash risk due to the intermittent, infrequent and unpredictable nature of the impairment.

Estimates of relative crash risk in patients with seizures and epilepsy vary widely [4]. The European Working Group on Epilepsy and Driving state a hazard ratio of 1.4 for serious accidents and 1.84 for all accidents compared to the general population [5], whilst a Danish study reports a seven-fold increase in risk [6]. These data are difficult to interpret as much of it has been collected in countries where driving restrictions for people with epilepsy are enforced. Data from countries without formal driving restrictions for people with epilepsy, such as Thailand [7], show much higher rates of seizure-related accidents, but higher baseline crash rates [8] make direct comparison to Australian drivers difficult.

The European Working Group on Epilepsy and Driving propose that a 1% increase in crash risk above the general population, similar to that associated with a blood alcohol level of 0.05%, is acceptable to the community [5]. This risk estimate, along with risk of seizure recurrence, estimates of time spent driving for private and commercial drivers and the expected consequences of a seizure whilst driving, underpin current Assessing Fitness to Drive Guidelines (AFTDG) with the latest revision published by Austroads on 1 March 2012 [9].

Compared to the previous 2003 guidelines, there are significant changes for drivers who have seizures or epilepsy. This includes extended non-driving periods for commercial drivers; driving suspension during and for 3 months after withdrawal or dose reduction of anti-epileptic drugs (unless due to drug side effects);

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clarification of non-driving periods for special situations not previously addressed (for example, acute symptomatic seizures); and removal of provision for shortened non-driving periods on the advice of an experienced consultant.

Although the 2003 guidelines specified decisions to shorten non-driving periods should only be made by "consultants experienced in the management of epilepsy", it had become common practice in many centres across Australia to routinely allow people to drive 3 months after a first seizure. Shorter non-driving periods are now only considered under exceptional circumstances and the decision explicitly lies with the driver licensing authority rather than the treating doctor.

2. Aims

The release of the new guidelines raised concern among neurologists regarding the impact on patients with these "tougher" guidelines. We assessed the validity of this concern by determining the impact of the AFTDG 2012 on driving eligibility in a South Australian Seizure Clinic cohort. Our secondary aims were to (a) determine the proportion of patients currently abiding by these guidelines and (b) assess whether the new guidelines were more reliable and consistent in the hands of non-specialists.

3. Methods

The objectives were met with a retrospective observational case note review of all patients seen in an Adelaide tertiary referral hospital Seizure Clinic between 1 March 2010 and 1 March 2012, inclusive. Ethics approval was obtained through the local Human Research Ethics Committee.

Three-hundred and nineteen patients were identified for review. Two auditors (an epilepsy nurse practitioner and a neurology registrar) collected and collated data by reviewing case note records, investigations and electronic discharge summaries. All parameters necessary to allow a decision to be made regarding eligibility to drive for both private and commercial vehicles according to 2003 and 2012 AFTDG were recorded. Information was recorded as effective on 1 March 2012.

Patients were excluded from further analysis if they (a) were deemed to be non-license holders due to permanent inability to drive due to reasons other than seizures (for example, severe intellectual disability); (b) had an undocumented current driving status; (c) had insufficient clinical data recorded for a reasonable assessment of eligibility to drive to be made; or (d) had a primary diagnosis other than epilepsy or seizure (such as syncope, or psychogenic non-epileptic seizures). Patients who did not hold a licence but for whom there was no clear permanent contraindication to becoming a licence holder in the future were included in the study.

De-identified data were presented independently to two senior neurologists with extensive experience in the assessment and management of seizures, and a non-specialist, a junior neurology registrar, along with the 2003 and 2012 AFTDG. A determination of driving eligibility was obtained from each assessor for a private and/or commercial vehicle applicable on 1 March 2012. Where there was disagreement, cases were reviewed collaboratively and a consensus was achieved. Where there was a difference between the driving eligibility under the 2003 *versus* 2012 AFTDG, the reason for this was recorded. Discrepancies between the expert and non-expert verdicts were also noted.

4. Results

Of the 319 subjects identified in our clinic population, 177 met exclusion criteria. Of the 142 included, 141 were assessed regarding private licence eligibility and 133 were also assessed regarding commercial licence eligibility (Fig. 1). There was a slight male predominance (86/142, 60.6%) and a mean age of 44 years (range 18–83 years). Two interstate residents were included in the study. Almost half of the included subjects were driving on 1 March 2012 (69/142, 48.6%). Eight (5.6%) subjects had a history of holding a commercial vehicle licence. Seven (4.9%) had a documented history of a motor vehicle accident due to a seizure in their lifetime.

4.1. Eligibility to drive

Of 141 subjects assessed regarding eligibility to drive a private vehicle, 74 (52.5%) were eligible under the 2003 AFTDG and 71 (50.4%) were eligible under the 2012 AFTDG. Seven (4.9%) subjects experienced a change in their eligibility. Five (3.5%) previously eligible subjects were no longer eligible to drive. This was due to the loss of the provision for a shortened 3 month period for subjects with a first seizure or new diagnosis of epilepsy (three subjects) and the introduction of a requirement to stop driving during medication dose reduction (two subjects). In all cases the expert assessors indicated they would have permitted the shortened non-driving period or continuation of driving during dose reduction for these subjects under the 2003 AFTDG. Two (1.4%) previously ineligible subjects became eligible to drive with the introduction of the 2012 guideline. In both cases this was due to the need for a 2 year period of seizure freedom in persons with a history of "uncontrolled epilepsy" prior to resumption of driving being removed from the revised guideline.

Of 133 subjects assessed regarding eligibility to drive a commercial vehicle, the vast majority were ineligible under both guidelines (127 [95.5%] *versus* 130 [97.7%]). Three (2.3%) subjects previously eligible to drive a commercial vehicle became ineligible with the introduction of the 2012 guideline. In all cases this was due to the removal of a provision for persons with a diagnosis of epilepsy on treatment with a non-epileptiform electroencephalogram and no more than three seizures in the last 10 years being permitted to drive after 5 years of seizure freedom. The 2012 guidelines now stipulate that the default standard of 10 years of seizure freedom applies. There were no previously ineligible subjects who became eligible to drive a commercial vehicle under the 2012 guideline.

Only one case required further discussion to reach a consensus between the two experts. This was regarding commercial licencing for a subject with a single symptomatic seizure more than 12 months ago due to hyponatraemia of unknown aetiology. On review, this subject was deemed ineligible to drive a commercial vehicle.

4.2. Compliance with guidelines

Of the 141 subjects assessed regarding a private vehicle licence, 68 (48.2%) subjects were documented to be driving on 1 March 2012. Of those driving, six (8.8%) were doing so against the 2003 guideline; this increased to 13 (19.1%) under the 2012 guideline.

There were seven subjects assessed regarding a commercial vehicle licence who had previously held a commercial licence. Of these, two subjects were current commercial drivers. Only one was eligible to drive a commercial vehicle under the 2003 guidelines and neither driver was eligible under the 2012 guidelines.

4.3. Expert versus non-expert use

We assessed the ease of use and reliability of the AFTDG in the hands of specialists *versus* non-specialists. Our specialists were senior neurologists with extensive experience in the assessment