



Bias in counseling of seizure patients following a transient impairment of consciousness: Differential adherence to driver fitness guidelines



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ABSTRACT

Purpose: To determine primary care physicians' counseling as well as patients' driving behaviors following seizure and non-seizure events impairing consciousness in the community.

Methods: Patients attending a rapid-referral first seizure clinic were entered into the study if they were deemed medically-unfit to drive according to national guidelines for driving licensure: had experienced a seizure or an unexplained episode of lost consciousness, and had a valid driver's license at the time of their index event. Risk of physician counseling in the community regarding driving cessation in the interval between initial primary care assessment and neurological consultation was examined as a primary outcome, and patient driving cessation was examined as a secondary outcome.

Results: 106 of 192 (55%) patients attending clinic met guideline criteria requiring driver fitness counseling in the primary care community, and 89 patients (46%) were deemed medically-unfit to drive following the initial specialist consultation appointment. Among medically unfit driver cases, 73% were ultimately deemed to have experienced a seizure and 27% had experienced a non-seizure event (e.g. syncope, PNES). Driver fitness counseling was more likely for seizure than non-seizure cases (unadjusted odds ratio: 4.14, $p < 0.05$), as was patient driving cessation (5.10, $p < 0.05$).

Conclusion: Physician compliance with clinical practice guidelines appears strongly biased when counseling about driving following an episode of transient impairment in consciousness. The failure of the primary care medical community to apply driver fitness counseling equitably to both seizure and non-seizure drivers may have ramifications upon public safety or conversely disease-related quality-of-life.

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1. Introduction

Drivers prone to sudden and unexpected transient impairment of consciousness are at increased risk for having a motor vehicle collision (MVC) [1,2]. While driving is critical for independence, employment and overall quality of life [3], physicians must also consider the risks of human injury or property damage when advising their patients. As such, patients with epileptic seizures are frequently counseled against driving by their physician because of safety concerns [4]. A sudden and unexpected transient impairment of consciousness, however, can also occur in several

conditions that mimic seizures (e.g., syncope, psychogenic seizures, hypoglycemia, sleep attacks), and it has been estimated that these are 3–10 times more prevalent than are seizures [5–7]. The onus, therefore, falls squarely on physicians to evaluate driver fitness for a great number of patients, and to counsel against driving notwithstanding the potential impact upon patients' quality of life [8].

Clinical practice guidelines have been developed to help guide physicians' driver fitness evaluations [9–15]. In spite of evidence that physicians' driver fitness counseling effectively reduces MVCs and related injuries [16], physicians frequently fail to counsel their patients according to guidelines [17–19]. Omissions in driver fitness counseling may occur more frequently among primary care physicians (PCPs) compared to specialists, as one retrospective chart review of 267 drivers presenting to an Emergency Department (ED) following a transient impairment of consciousness found that counseling against driving increased from 7.1% to 34.5% after a neurologist became involved [4]. Primary care physicians

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have incomplete knowledge of driver fitness guidelines [20,21] and questionnaires of PCPs suggest that they may be preferentially targeting seizure patients [22].

In this study, we examined if seizure patients are more likely to: (a) receive counseling against driving in the primary care community following a transient impairment of consciousness event, and (b) subsequently cease driving, compared to medically unfit non-seizure patients.

2. Methods

2.1. Sample

The source population for the study was primary care-patient encounters for a recent episode of transient impairment of consciousness that require driving restrictions. Subjects were enrolled over 24 consecutive months (beginning December 2011) following initial consultation at the First Seizure Clinic (FSC) of the University of Alberta Hospital (Edmonton, Canada). The University of Alberta Hospital is a tertiary care referral center servicing northern Alberta. The “First Seizure Clinic (FSC)” is closely liaised with the primary care community in the region, offering prompt neurological consultation for patients with suspected or possible seizures who are not currently being followed by an adult neurologist. At the FSC, a fellowship-trained epileptologist (JJ) and general neurologist (PS) work in concert with an epilepsy nurse to evaluate patients typically within four weeks of their referral.

Alberta is a non-mandatory physician reporting jurisdiction in which the onus relies heavily upon patients to follow physicians’ confidential counseling about driving. Medically unfit drivers very often remain unknown to the local Transportation Registry because patients neglect their legal duty to self-report (authors’ observations). The province uses a solitary source to determine driver fitness, The Canadian Council of Motor Transportation Authorities (CCMTA) [9] document determining medical fitness to operate a motor vehicle (2011). Similar to other national guidelines [10–12,14,15], the CCMTA instructs physicians (and patients) to cease driving after an unexplained episode of impaired consciousness. The CCMTA guidelines thereby instruct that patients referred to a specialty clinic following an unexplained transient alteration of consciousness (i.e. in which the referring physician requests additional expertise) require counseling against driving by their referring physician in the interim.

At the FSC, neurologists endeavor to determine driving risk based upon an assessment of recurrence risk as well as an assessment of accident risk in cases of recurrence. Decisions about driving cessation at the initial FSC encounter are again guided by the CCMTA document. Accordingly, for cases of a single neurocardiogenic syncopal spell or a seizure secondary to a reversed transient metabolic abnormality no driving precautions are given, whereas cases of frequently recurrent neurocardiogenic syncopal spells or a single unprovoked seizure are advised to at least temporarily refrain from driving.

Included in the study were patients attending the FSC and referred from the primary care community for an episode of transient impairment of consciousness. Patients were excluded if they did not routinely drive or did not have a valid driver’s license at the time of the index event. Patients were also excluded if they had previously been seen by a neurologist for the index event or had been previously diagnosed with epilepsy by a neurologist.

The study was approved by the University of Alberta research ethics board. Written consent was waived by the board.

2.2. Measures

To evaluate driving behavior following the initial primary care patient encounter, self-reported interim driving behavior (yes/no) was assessed at the time of presentation to the FSC clinic. Using a standardized survey, the FSC nurse asked patients: “Have you been driving a motor vehicle since the episode which prompted this referral?” Patients’ responses were recorded by the nurse in the Electronic Medical Record, and were entered into the study database (MS).

The primary study outcome was evidence of driver fitness counseling prior to the neurologists’ assessment. Evidence of driver fitness counseling was ascertained using two strategies: (1) patients’ self-report when asked by the FSC nurse: “Were you told by a medical professional after your recent episode, and before today, not to drive a motor vehicle?”; (2) FSC referral documentation through retrospective medical chart review. Referring physicians’ notes are forwarded to the FSC at the time of referral, and driver fitness counseling was deemed to have occurred if a reference to the term “drive”, “driving”, “license” or “vehicle” was discerned from physicians’ mostly hand-written notes. Prior documented driving counseling was considered present if investigators recognized references to driving in physicians’ notes; any evidence of driving counseling was considered present if, either, physicians’ documented driving counseling or patients’ self-reported prior counseling was ascertained by investigators.

Patients with transient loss of consciousness events were classified as either having clinically-probable seizures (hereafter termed “seizure patient”) or having probable non-seizure events (hereafter termed “non-seizure patient”) at the time of the FSC encounter by two board-certified neurologists (JJ, PS). Patient diagnoses were collected (MS) from ICD-10 codes within patients’ Electronic Medical Record and recorded in the study database. Semiology of the index event (i.e. convulsive vs. non-convulsive) as well as any history of transient episodes of impaired consciousness prior to the index event were recorded from FSC notes.

2.3. Statistical analysis

Categorical data were displayed as counts and percentages for 67 seizure and 39 non-seizure patients, separately. Primary (i.e., counseling against driving) and secondary (i.e., driving history) outcomes were compared between the two exposure groups (seizure vs. non-seizure) using a chi-square test (KM). Sensitivity analyses included data on 17 patients that were deemed fit to operate a motor vehicle at the initial FSC neurological evaluation. Statistical significance was set at $p < 0.05$. Stata 11 statistical package (Stata Corp, College Station, TX) was used for all analyses.

3. Results

Among 192 patients initially evaluated at the FSC over 24 months, 106 (55.2%) were medically-unfit to drive after their PCP encounter and were included in the study. Eighty-six patients were excluded: eight did not have an alteration in consciousness with their events, four did not provide information about their driving behaviors at the FSC, 59 did not have a valid driver’s license or were not drivers, five had seen another neurologist during the event-FSC interval, and ten had a pre-existing diagnosis of epilepsy.

Characteristics of 106 eligible subjects evaluated in the FSC are detailed in Table 1. Of the 106 eligible subjects, 89 (84.0%) were deemed medically unfit to drive following the specialist FSC evaluation. Among medically unfit drivers, driver fitness counseling was documented for 46 patients (52%), and any evidence (i.e. PCP documentation or by patient report) of prior driver fitness counseling was found for 74 (83.1%) patients.

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