

EDITORIAL COMMENT

On the Road Again After Vasovagal Syncope?*



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Many things can cause motor vehicle accidents. Although medical conditions are rarely the cause, the relationship between syncope and accidents is well known. In 1958, Norman began collecting data on London Transport bus drivers to study medical conditions causing accidents (1). More than 19 years and 6.3 billion miles later, 54 accidents (1 per 115,000,000 miles) were found to be due to a medical condition. Syncope of undetermined etiology contributed to 14 accidents, 10 of which resulted in a collision. Vasovagal syncope (VVS), present in 20 drivers, caused 12 collisions. To put this into perspective, epilepsy was diagnosed in 18 drivers and caused 14 collisions in this same report (2).

Sorajja et al. (3) observed that 381 (9.8%) of 3,877 patients with syncope passed out while driving; 142 of the 381 patients passed out due to VVS. The cumulative probability of recurrent syncope while driving was 7% over 8 years. Similarly, Li et al. (4) reported that 23 (9.4%) of 245 consecutive patients with apparent VVS fainted during driving. Most had attacks of syncope several times before passing out during driving. Injury occurred in 9 patients and death in 1 patient. In another report of 155 consecutive patients with purported, and subsequently “treated,” VVS, 2 passed out while driving and 1 was injured because of it (5). Fifty-two (34%) patients had no warning, 6 stopped driving altogether, and 5 had recurrent syncope over a 22-month follow-up period.

Thus, although VVS during driving is rare, it is not inconsequential. As stated by Bhatia et al. (5) in 1999: “Consensus among the medical community will be needed to provide specific guidelines in these patients.” This consensus has not yet occurred.

Nevertheless, in a survey of 66 physicians managing >11,500 patients with probable VVS, in whom 17 accidents occurred purportedly due to syncope, the mean recommended driving restriction was 54 ± 10 days (6). Most physicians ultimately permitted driving on a case-by-case basis. Sheldon and Koshman (7) evaluated 217 adults with suspected VVS. Seven stopped driving; 1 had ~6,000 spells without an accident; and 5 lost consciousness while driving, 4 of whom had motor vehicle accidents. Two were injured while driving, but no one else died or was injured. The investigators estimated that the low risk of syncope with driving (0.33% per driver per year) coupled with the low risk of harm from a crash (0.13% per year) would be even lower with counseling and proper treatment (whatever that might be). However, for those with recurrent symptoms, especially without a prodrome, driving restrictions were recommended for ≥ 3 months.

Does it ever make sense to consider driving restrictions for patients with this benign condition? It may, depending on the circumstances. If episodes are recent, increasingly frequent, unexpected, without prodrome, or present in clusters, perhaps not. Without doubt, it is difficult to proffer blanket statements about the safety of driving with VVS. Determining which patient should be given the green light to drive remains a challenge.

The Canadian Cardiovascular Society (CCS) developed a formula to estimate risk of harm driving (risk of harm = time driving \times vehicle type \times risk of sudden incapacitation \times probability that an event will be fatal or cause an injury) (8). Based on assumptions and

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hypothetical estimates, this formula is helpful but incomplete and not validated. The CCS considered driving acceptable after syncope if the chance of a sudden incapacitating (i.e., recurrent) event was <22% annually. This translates into an expected risk of serious injury or death at 0.005% per driver-year (much less risk than that of a healthy male teenaged driver but similar to a truck driver post-myocardial infarction).

CCS recommended no restriction for a single episode of typical VVS unless syncope occurred sitting or if the prodrome was insufficient to navigate the vehicle to safety. If VVS was recurrent (within 12 months), a 1-week restriction was recommended. The American Heart Association and the North American Society for Pacing and Electrophysiology recommended no restriction if episodes were “mild,” a 3-week wait period if episodes were “severe” but “treated” (whatever that means), and total restriction if episodes were severe and untreated, leaving open a wide range of possibilities but little guidance (9).

These recommendations are based in part on theoretical models, estimations, calculations, and conjectures, but the few hard data available are from small studies only. The estimations of risk are too unreliable. Thus, the present study in this issue of *JACC: Clinical Electrophysiology* adds valuable and important information. Tan et al. (10) evaluated risk of driving with recurrent VVS as part of a prospective assessment of 418 subjects enrolled in the POST (Prevention of Syncope Trials) 1 and 2 studies and treated with a drug proven ineffective or with placebo. Despite the short follow-up (0.77 year per person), 174 of 418 subjects had 615 episodes of VVS.

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Two passed out while driving but neither subject sustained or caused injury. The probability of syncope was 0.62% per person-year, with a calculated risk of harm of 0.0035% per person-year (0.0018% per faint). These data were compared with international accident data gathered from the Internet to estimate risk of harm utilizing the CCS formula (8). Assuming that the international accident data were accurate, those with VVS had a similar low risk of causing harm while driving. This conclusion, however, must be taken in perspective. Although the data of Tan et al. support previous data that it is generally safe to drive with a history of VVS, should all individuals with VVS go on the road again? Perhaps not.

The estimates about risk made in the study by Tan et al. (10) are simply estimates. The numerical value for the fractional time spent driving was not known,

for example. The study was too small and the follow-up too short to make definitive statements about driving. To test if all patients with VVS meet conditions of “acceptable risk for crashes causing serious harm” (1 per 20,000 drivers per year [0.005%]), a huge study would need to be conducted that included all types of clinical presentations of VVS not replicated in these small controlled studies. POST 1 and 2 subjects were not necessarily average VVS patients. They may represent the “worst case scenario” due to frequent recurrences. Apparent “treatment” (placebo effect because there was no effective treatment given) may have reduced the risk of recurrent VVS during driving.

In addition to estimates from the CCS formula and projections from small to large populations, critical information is missing in the study by Tan et al. (10). The number of people who were driving, how much they were driving, and what type of driving they were doing is not mentioned. No motor vehicle accidents were reported from other causes. Presumably there were several but, if not, this would also suggest a biased population. The time from the last faint to the time of driving was not reported. The investigators also did not provide history of motor vehicle accidents with or without VVS before study enrollment. Study participants had reason to underreport driving accidents for fear of being restricted. Alternatively, a diagnosis of VVS may provide an excuse for patients: If an accident is associated with another cause (e.g., alcohol intoxication), a claim may be made that the accident was due to VVS to avoid punitive damages and to shift the blame elsewhere.

Data from Tan et al. (10) support previous data that driving is generally safe for those with VVS. These data are not strong enough, however, to state, without compunction, that the road is clear for those with VVS, especially if the diagnosis is uncertain or if episodes are frequent, recurrent, unpredictable, and without prodrome. Reticence to allow driving after purported VVS will remain for these subjects, and other, select individuals (e.g., commercial drivers), and will be based on prevailing laws.

Thus, we have come to a fork in the road. Individualized decision-making remains sacrosanct. For some individuals, VVS indicates a red light to driving. For most, however, VVS means just a short brake before getting back on the road again.

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