



The Diabetic Driver

A potential problem associated with diabetes that has been infrequently addressed in the instruction of diabetic patients is the possibility of insulin-induced hypoglycemia while driving. Complications of diabetes such as retinopathy, cataracts, and ischemic heart disease can eventually lead to some driving impairment; however, as will be documented in more detail later in this editorial, the main medical reason for questioning the driving ability of the diabetic individual nearly always arises from the occurrence of an episode of insulin-induced hypoglycemia while driving: The individual's blood glucose drops to a level associated with impaired mentation, resulting in a traffic accident. Such episodes are a matter of concern for licensing boards as well as for diabetic drivers. As a member of the Medical Advisory Board to the Department of Highway Safety and Motor Vehicles for the State of Florida, sixth both in population and in the number of licensed drivers in the United States, I have read many accident reports involving hypoglycemic diabetic drivers. These reports are sometimes on the spectacular side, recording the hitting of not one, but several vehicles or other objects by the careening car of the hypoglycemic driver, as illustrated by the following representative cases.

Case 1. A 50-yr-old woman with a history of insulin-dependent diabetes mellitus (IDDM) since age 25 sideswiped a second car while driving her car the wrong way off an exit from an interstate highway; she then continued on to the street and several blocks later hit the rear end of a third car. Her car then left the road and came to rest at the point of impact with a tree. Blood glucose drawn by paramedics on the way to the hospital revealed a level of 23 mg/dl.

Case 2. A 20-yr-old man, with a history of IDDM since age 8, had begun a new job with increased physical exertion and had failed to eat lunch that day. While being followed by police who had observed him driving erratically, his car hit a guard rail and flipped over. Blood glucose drawn in the ambulance was 35 mg/dl.

Case 3. A 27-yr-old man with a 5-yr history of IDDM crossed the raised median and began to drive northbound in the southbound lanes while driving on a four-lane highway.

He then struck the left rear of a second vehicle with his right front; continuing northbound, he struck a third vehicle in the right rear with his left front, causing it to strike a fourth vehicle. He then continued on, striking a fifth vehicle on the right side and came to a stop at point of impact with a sixth vehicle. One person was killed in this six-vehicle accident. The medical report indicated insulin-induced hypoglycemia as the cause of the accident.

It is obvious that the above are extremely worrisome and present probably the most difficult problems of all the cases that the Medical Advisory Board is asked to review with regard to granting or denying the driving privilege.

LITERATURE REVIEW

There is not a great deal of reliable data on the contribution of insulin-induced hypoglycemia to traffic accidents as judged by a computer search of the literature. Studies available have indicated that this contribution in numbers appears relatively small, especially in comparison to those associated with alcohol intoxication; however, based on my experience the incidence may be somewhat greater than that which found its way into the literature. A study from Sweden indicated that of 44,255 traffic accidents from 1959 to 1963, 41, or approximately 0.1%, were due to sudden illness and, of these, 3 were due to diabetes with hypoglycemia.¹

A study of 350 patients attending a diabetes outpatient department at Edinburgh Royal Infirmary indicated that 13.6% admitted being involved in a driving accident since starting insulin therapy, and 13 of these listed hypoglycemia as the causal factor. This report also stated that personal communication with the Department of Transport indicated that of 1000 collapses occurring while the driver was at the wheel and causing a traffic accident, hypoglycemia was responsible for 17%.²

In the state of California a sample of 2672 drivers with chronic medical conditions, of whom 287 had diabetes, was compared with that of 922 drivers adjusted for age. The statistical evaluation indicated that the drivers with diabetes averaged twice as many accidents and one and one-half times as many violations per 1 million miles driven in comparison with the control group.³ Crancer and McMurray⁴ compared

This form has since been sent out to physicians making reports on diabetic drivers and has resulted in considerably more specific information on the involved individual to better enable the board members to make a decision.

It is obvious that even more desirable than preventing repetition of this type of accident is preventing the accident *before* it occurs. The best and actually only method of such prevention is suitable education regarding this problem. Instruction in the avoidance of hypoglycemia while driving should be the responsibility not only of the physician who prescribes the insulin and counsels regarding its use, but also should be a part of instructions given in classes for the treatment of diabetes. It is not unusual to read books and manuals written on the treatment of diabetes, as well as similar instructional material for classes, in which this problem is not addressed. A study in the United Kingdom of an outpatient clinic diabetic population revealed that 49% of men and 19% of women had experienced symptoms of hypoglycemia while driving, and less than half of these had carbohydrate available in their cars.¹³ It has been my own observation that most diabetic patients who have come under my care have never had this matter discussed with them before, even though they may have had diabetes for many years. Every diabetic patient should be made aware of the potential seriousness of an insulin reaction while driving. He should be questioned regarding his driving habits and given suitable advice by the physician and/or instructing paramedical personnel, depending on the person's own particular situation. For example, some patients may need to be told to take a small amount of carbohydrate before driving home from work to prevent the late-afternoon hypoglycemia they tend to experience secondary to the morning dose of NPH or lente insulin. Likewise, the patient who bowls in the evening may need to be admonished to eat his bedtime snack at the bowling alley before driving home, in view of the blood sugar-lowering effect of exercise. The importance of neither missing nor postponing meals while driving and of having a source of carbohydrate always available in the car should be stressed. The young driver with IDDM, who exhibits wide swings in blood sugar and indifferent compliance, needs special counseling regarding the avoidance of hypoglycemia while driving, and if it has occurred, how to avoid a repetition. Physicians need to consider this problem in weighing the therapeutic options of oral drugs versus insulin

in the older driver having NIDDM, whose driving may already be somewhat impaired by faulty eyesight and slowed reflexes, in order to avoid imposing on him the further liability of a possible hypoglycemic reaction.

It has been said that more people die on our highways than in our wars. This thought should lead the physician to exert all possible effort to correct any medical situation that might further contribute to highway morbidity and mortality. The only real solution to prevention of the motor vehicle accident due to hypoglycemia rests in the proper education of the diabetic driver.

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