

Neuroglycopaenia automatism and driving culpability

Abstract

Hypoglycemia unawareness is a stage of automatism in a neuroglycopaenic state of the brain for insulin treated diabetes mellitus patients. Most of the Medicolegal and legal fraternity need awareness in examining such patients when they have an accident while driving. There should be a clear guidelines for people suffering from diabetes and are on insulin and oral hypoglycemic. Diabetic patients, because of their propensity to develop hypoglycemia, are more likely to be involved in a driving accident, although only slightly more than the rest of the population. Therefore, it has been a matter of debate since the earliest days of insulin therapy whether patients on insulin therapy should be allowed to have a driving license or not. Heavy vehicle licensing should be properly evaluated on regular intervals for the safety of patients, otherspeople on the road, and the vehicle.

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Mohd Kaleem Khan,¹ Maaz Ozair²

¹Assistant Professor, Department of Forensic Medicine, Aligarh Muslim University, India

²Senior Resident, Rajiv Gandhi Centre of Endocrinology, Department of Medicine, India

Correspondence: Mohd Kaleem Khan, Assistant Professor, Department of Forensic Medicine, J. N. Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, 202002, India, Tel +919997992459, Email khan4uat9@gmail.com

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Introduction

The brain constantly requires glucose to function at an optimum level and at with a tightly regulated blood glucose level of 4–10 mmol/L. Any decrease in blood sugar level (< 72mg/dL.) can hamper the proper functioning of the brain.¹ Insulin dependent diabetes is one of the factors for the derangement of blood glucose level. Insulin was introduced for the treatment of diabetes long way back in 1922, but it still needs proper monitoring and tight regulation.² Hypoglycemia generally defines the blood glucose level, which may be at a lower than certain marked level in the blood 72mg/dL. It does not reflect the absolute condition of glucose supply to the brain. Symptoms of hypoglycemia can cause profuse sweating, increased system as part of the body's defense against the effect of hyperglycemia in the brain. These symptoms are collectively called as acute neuroglycopaenia. Sometimes, these symptoms pass undetected, termed as sub-acute neuroglycopaenia (hypoglycemia unawareness).³⁻⁵ Individuals suffering from hypoglycemia unawareness may perform certain habitually performed tasks such as talking, walking, cooking, car driving, etc. When the patient recovers from such episodes, there is no memory of whatsoever work during that episode. There seems to be needs of comprehensive studies to evaluate the cases of hypoglycaemia unawareness and proper law to deal it. Theoretical method applied in this article was to study various reported cases of hypoglycaemia unawareness and various legal aspect applied to these cases.

Neuroglycopaenia automatism

It has been acknowledged by some courts that patients may act impulsively while they are impaired by neuroglycopaenic brain malfunction and are incapable of forming intent to commit an offense, ranging from the trivial to the most heinous.⁶ Hypoglycemia unawareness is not self-destructive, but may cause serious damage to surrounding people and property. During driving when this happens, a person may cause an accident and continue driving until reaching a destination or stopped by traffic police. It has been reported in the past in the UK to justify a plea of not guilty based on hypoglycemia unawareness.⁷ Because of their propensity to develop hypoglycemia, diabetic patients are more likely to be involved in an accident during driving only slightly more than the rest of the population.^{8,9}

Various indicators of neuroglycopaenic behaviour:

- Circumstances to the development of hypoglycemia.
- The suspect had taken insulin or hypoglycemia-producing drug at the relevant time.
- Change in the patient's demeanour after being giving sugar.
- Amnesia for the events
- Motiveless and uncharacteristic behaviour.

Law and neuroglycopaenia automatism

Neuroglycopaenia automatism seems to be a grey area in which laws of most developing countries have not paid attention. A country such as India having a population of about 1.25 billion with more than 62 million (7.1 percent) diabetic patients, needs separate regulation on such type of automatism.¹⁰

Characteristics that may be observed during trial in court

- The driver suffered hypoglycemic unawareness or had some warning symptoms;
- Was the driver previously aware of the condition? Or,
- He should not have been driving at all.

In India, automation and other types of mental conditions are dealt with in the Indian Penal Code (IPC) section 84. The section of the law mentions about unsound mind and the incapability of knowing the nature of the act.¹¹ Almost negligible reporting of hypoglycaemia unawareness cases doesn't seem depicting the real picture of such conditions but it may merely be reflecting unawareness of the condition. This hypoglycemia unawareness needs a proper attention address on all fronts, including medical, legal, political and social.

Vehicle driving and neuroglycopaenia automatism

Poor driving conditions and again heavy unautomated vehicles may cause early neuroglycopaenia and that can go undetected. Most jurisdictions have concluded that, as a matter of public policy, the

risk is sufficiently small for insulin-treated diabetic patients to be permitted to hold a driving license provided they fulfil certain criteria. More stringent conditions apply to those driving public-service or large goods vehicles.¹²

Conclusion

- a. There needs to be proper legal and policy guidelines in for conditions of hypoglycemia unawareness and with especial attention to transportation, driving sector and fine skilled work sectors.
- b. Those afflicted need to be given adequate advice when first prescribed insulin.
- c. There should also be public awareness programs on such topics.
- d. Medical examiners at autopsies and crime scenes should also pay attention to such subjects while examining the accident cases.

Conflicts of interest

All authors declare that they have no conflict of interest.

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