

The Glasgow Coma Scale: a tool to decide the need for tracheal intubation in acutely intoxicated patients?

The Glasgow Coma Scale aids decision making with regards to advanced airway management of acutely intoxicated patients. There is some evidence for lower levels of gastric aspiration when using a Glasgow Coma Scale score of eight or less to decide upon tracheal intubation, but this is not substantiated in the literature.

Introduction

Originally designed by two professors of neurosurgery at the University of Glasgow, Teasdale and Jennet, the Glasgow Coma Scale assesses impairment in conscious level. It includes a composite of responses to defined extrinsic stimuli, which are then added together. On application of a painful stimulus, eye response scores up to four, verbal response up to five and motor response up to six; these scores total a maximum of 15 and minimum of three. With widespread application, including Advanced Trauma Life Support courses and as a component of the Acute Physiology and Chronic Health Evaluation scores, the Glasgow Coma Scale forms the current standard for monitoring conscious level in acute inpatients. Initially designed to assess conscious level in patients with acute brain injury, its use in acute poisoning – namely from drugs which depress the CNS – is less established. Acute drug intoxication forms a significant portion of admissions to UK emergency departments, emphasising the need for safe and justifiable practice.

A Glasgow Coma Scale score of less than eight can be used to determine the need for tracheal intubation

The Glasgow Coma Scale has been the cornerstone of evaluating neurological status since its inception. It is a composite measure of alertness and response to extrinsic stimuli, as well as important brainstem reflexes. A Glasgow Coma Scale score of less than eight has been associated with increased mortality following acute poisoning in a single-centre prospective follow-up study (Eizadi Mood et al, 2011). A 12-month prospective study found a Glasgow Coma Scale score of eight or less to be a useful indicator of the need for mechanical ventilation in acutely comatose patients (Chan et al, 1993). Lower scores may imply an increased likelihood of important airway reflexes being attenuated or absent, clinically justifying invasive ventilation and intensive care management to protect against aspiration of gastric contents. The nature of emergency admission with unknown history or fasting status can lead clinicians to err on the side of safety in establishing control of the airway.

A Glasgow Coma Scale score of less than eight is not sufficient to assess the need for tracheal intubation

A 2020 systematic review of the literature surrounding the risk of aspiration in acutely poisoned patients failed to establish a distinct benefit in invasive airway support, finding a relative paucity of evidence supporting a cut off which necessitated airway protection (Orso et al, 2020). Owing to the nature of assessing Glasgow Coma Scale scores, there is significant room for operator variability both in eliciting pain responses as well as interpreting findings. The lack of standardisation also makes the Glasgow Coma Scale less reliable as a definitive assessor. Furthermore, by investigating intensive care unit admissions it was found that although aspiration was more likely in those with a Glasgow Coma Scale score of less than eight, there was radiological evidence of aspiration in a number of patients (10/68) who had Glasgow Coma Scale scores between 9 and 14 (Adnet and Baud, 1996), suggesting a need to look beyond only Glasgow Coma Scale scores when evaluating

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aspiration risk. A 2016 retrospective cohort study found excess mortality, as well as length of stay, following intubation on arrival to the emergency department in patients with a Glasgow Coma Scale score between six and eight (Hatchimonji et al, 2020).

Conclusions

There is a significant lack of good quality evidence supporting the use of a distinct cut off in Glasgow Coma Scale scores, despite this being ingrained into the practice of many emergency departments. The care of acutely poisoned and obtunded patients must involve a careful balance of decision making to address the relative harms of invasive ventilation vs risks of hypoxia, respiratory failure and aspiration. It is important to appreciate that there is no single definitive tool to use when assessing airway protection. Instead, the Glasgow Coma Scale should be used as part of the wider assessment to help identify when an airway is at risk, as well as clinical reasoning to ensure safe practice of poisoned patients with an emphasis on pragmatism and harm reduction.

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