

Decreased Glasgow Coma Scale Score Does Not Mandate Endotracheal Intubation in the Emergency Department

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Introduction1

- Originally described in head-injured patients, the **Glasgow Coma Scale (GCS)** was devised as a tool for recording the level of consciousness at a particular moment.
- Established trauma teachings describe a **GCS of 8 or less** as necessitating endotracheal intubation in recognition of the high risk of secondary brain injury resulting from **hypoxemia** and **hypercapnia** caused by airway obstruction or respiratory compromise.

Introduction2

- a GCS of 8 or less is a useful guide for the requirement of endotracheal intubation where the cause of coma is **poisoning**. Decreased consciousness and loss of protective airway reflexes predispose to **respiratory failure** and **aspiration injury**.
- This observational study was aimed to examine the profile of poisoned patients admitted to the ED short-stay ward with a decreased GCS. It was also aimed to establish the incidence of clinically significant aspiration or other morbidities, and endotracheal intubation.

Materials and Methods1

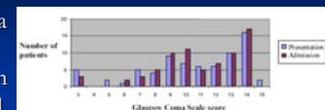
- A prospective, observational survey was conducted of all poisoned patients admitted to the Ninewells Hospital Emergency Department short-stay ward with a decreased level of consciousness (GCS < 15) from September 18, 2006 to December 2, 2007.
- Patients were included : if they had a GCS of < 15 as a **result of poisoning** at the time of admission to the short-stay ward.
- Patients were excluded :
 - external evidence of **head injury**
 - poisoned patients who recovered to GCS 15 before admission
 - patients were intubated in the resuscitation room and then transferred to ITU for further care.

Materials and Methods2

- Events were considered significant if a patient required intubation or admission to the ITU, had clinical evidence of aspiration, or had any other episode that required transfer back to the resuscitation room, including **cardiac or respiratory arrest**. Other transient episodes that resolved with standard treatment were not considered clinically significant.

Result1

- Data were collected for a total of 73 patients, ages 14–79 years. The median GCS at presentation and on admission to the short-stay ward was 11.
- 12 patients had a GCS of 8 or less on admission; none of these patients had clinically significant aspiration or required intubation and all had a GCS of 15 on discharge.
- Length of stay varied with GCS; the median was 26 h for those with a GCS of 8 or less but only 14 h for those with a GCS > 8.



Result2

- Seven (14%) of these had a GCS of 8 or less, none of whom required transfer to the ITU.
- 22 patients who consumed alcohol was considered to be the primary reason for their decreased level of consciousness, including 5 patients who presented with a GCS of 3.
- Of the 5 patients with a GCS of 3, 2 had rapidly improved to GCS 8 and 12 before admission to the ward. There were no adverse events, and all of these patients except 2 were discharged within 24 h with a GCS of 15.

	Poisoning	Alcohol Intoxication
No. of patients	51	22
Median GCS	12	10
Median length of stay (hours)	19.1	12.6
No. of admissions	1	0

Results

- One patient required intubation and referral to the ITU. The patient presented with an overdose of dihydrocodiene, amitryptiline, and quinine, and had a GCS of 14 on admission to the ward.
- One hour later the GCS had deteriorated to 6 and the patient was transferred back to the resuscitation room, where the patient was intubated before admission to the ITU.
- There were no episodes of clinically significant aspiration, cardiac or respiratory arrest, and no patient required a head CT scan.

Discussion1

- The overall incidence rates for intubation and aspiration were 1.4% (1/73) and 0% (0/73), respectively.
- Alcohol is a major cause of decreased level of consciousness in the ED. The data presented demonstrate that isolated alcohol-intoxicated patients had the lowest median GCS but made a more rapid recovery with no adverse events.

Discussion2

- Unlike trauma, there are no criteria for the need to intubate poisoned patients. This is reflected in our study, as there were a total of 12 poisoned (overdose, alcohol, or both) patients with a GCS of 8 or less admitted to the ward for observation, none of whom went on to aspirate or require intubation.
- The incidence of aspiration in poisoned patients has been reported as 0.8% with GCS 15, increasing to 4.5% when the GCS falls below 15.
- Another study found evidence of aspiration in up to 15% of poisoned patients with GCS > 9 and in 45% of patients with GCS < 9. Our experience suggests that the risk of clinically significant aspiration is less than this.

Discussion3

- The presence of a gag reflex may be suggested as useful when assessing the risk of aspiration, however, to actively try to stimulate the gag or cough reflex in someone with potentially impaired airway reflexes could cause vomiting and lead to aspiration.
- Several studies have demonstrated that the presence or absence of these reflexes cannot be predicted by GCS. Our study confirms this as we have shown that oropharyngeal airways can be tolerated at a GCS of > 8.

Limitations

- The design of this study as an observational study is a significant limitation. Staff members were aware of the study and, therefore, a Hawthorne effect cannot be ruled out.
- There was no follow-up of the patients after their discharge from the ED and thus we could not identify any aspiration that may have presented late.

Conclusions

- Decreased level of consciousness is a common reason for presentation to the ED. Frequently, this is a result of drug or alcohol intoxication.
- This study suggests that it can be safe to observe these patients, even if they have a GCS of 8 or less, in the ED if a thorough assessment has been made by an experienced emergency physician.