

**Original article:**

## **Study of role of Glassgow Coma Scale (G.C.S.) in the outcome and predicting the management and prognosis of head injury patients**

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### **Abstract:**

**Introduction:** Traumatic brain injury (TBI) is the leading cause of death in patients and is responsible for more than 50% of all traumatic deaths. In the USA at least 5 million people (2% of the population) currently live with disabilities resulting from TBI, and each year at least 1, 4 million sustain a TBI. Of these, about 50.000 die, 85 per 100.000 persons are hospitalized and 390 per 100.000 inhabitants are treated and released from an emergency department.

**Methodology :** The present study was carried out on patients of head injury, referred to Department of General Surgery at Rural Medical College & Hospital, Loni, Tal. Rahata, Dist. Ahmednagar, during the period of May 2011 to September 2013.

100 Cases studied among the patients admitted with the head injury to Surgical Ward & ICU.

**Results :** Glasgow Outcome Score or Scale assessed as: 10% (10) cases patients were dead, 1% (1) case suffered in Vegetative state, 2% (2) cases suffered with Severe disability, 3% (3) cases suffered with Moderate disability, 84% (84) cases recovered well after mild, Moderate, Severe Head Injury.

**Conclusion:** Glasgow Coma Scale and its application early at casualty, Intensive Care Unit, pre and post operative period facilitates the assessment and recording of Severity Brain dysfunction and ultimate outcome.

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### **Introduction:**

Traumatic brain injury (TBI) is the leading cause of death in patients and is responsible for more than 50% of all traumatic deaths. In the USA at least 5 million people (2% of the population) currently live with disabilities resulting from TBI, and each year at least 1, 4 million sustain a TBI. Of these, about 50.000 die, 85 per 100.000 persons are hospitalized and 390 per 100.000 inhabitants are treated and released from an emergency department. In the Netherlands, each year about 60 per 100.000 inhabitants require hospitalization and around 90 per 100.000 persons with an age of 20 years or older visit the emergency room of a hospital because of a TBI. In 2002 around 950 (6 per 100.000) Dutch persons died because of a TBI<sup>1</sup>. The Glasgow Coma Scale (GCS) was introduced in 1974, a method for determining objectively the severity of brain dysfunction and coma, six hours after the occurrence of head trauma (HT). Nowadays, it is by far the most widely used score to assess the severity of HT in clinical research and to compare series of patients. The main advantage of this scale is that it can be utilized by physicians, nurses, and other care providers due to its simplicity. In the present review the history of GCS. The principles of scoring, the applications, the shortcomings and future trends concerning its application are discussed<sup>2,3</sup>.

### **Material and Methods**

The present study was carried out on patients of head injury, referred to Department of General Surgery at Rural Medical College & Hospital, Loni, Tal. Rahata, Dist. Ahmednagar, during the period of May 2011 to September 2013.

100 Cases studied among the patients admitted with the head injury to Surgical Ward & ICU.

**Research Design :** A prospective hospital based observational study.

**Study Population :** In the present study 100 cases of Head Injury were studied who were admitted under General Surgery.

**Duration of study :** May 2011 To September 2013

**Sample Size :** 100 Patients.

**Patient Selection**

**Inclusion Criteria :**

1. Adults from the age of 18 years onwards.
2. Patients with a history of road traffic accident, fall or assault were included in this study.

**Exclusion Criteria :**

1. Pediatric cases.
2. Patients those could not be followed for reasons like : shifting of patient by patients relatives to other cities

Almost all patients had altered sensorium or neurological deficit or a combination of both. All these patients were clinically assessed and grouped according to the Glasgow Coma Scale before the procedure was conducted.

**Outcome factors:**

As per Glasgow outcome scale; death , vegetative state , severe disability , moderate disability ,and good recovery were the outcomes which were assessed at interval of one month.

**Observation & results**

The patients in young age group 14-30 years accounted for 46% (46) cases. Middle age group 31-50 accounted for 45% (45) cases. Elderly age group (50 years and above) accounted for 9% (9) cases. The average age in present study was 36.40 years.

Road Traffic Accident was the commonest mode of injury accounted 65% (65) cases followed by fall, 34% (34) cases and only 1% (1) case accounted under assault. This signifies Road Traffic Accident is the most common causes of the Injury in all age groups.

Table no 1

Sr. No.	Categories	GOS	Percentage of cases
1	Dead	1	10%
2	Vegetative state	2	1%
3	Severe disability	3	2%
4	Moderate disability	4	3%
5	Good recovery	5	84%

Glasgow Outcome Score or Scale assessed as: 10% (10) cases patients were dead, 1% (1) case suffered in Vegetative state, 2% (2) cases suffered with Severe disability, 3% (3) cases suffered with Moderate disability, 84% (84) cases recovered well after mild, Moderate, Severe Head Injury.

### Discussion

With the constant increase in high velocity accidents and violence over past decades, the matter of acute head trauma is one of prime importance. In his classic textbook dealing with head trauma, Brock states that - "The appealing number of accidents in modern life makes the subject of injury as important as that of any pandemic scourge".

The acute effects and the chronic sequelae of trauma are often severely disabling so the importance of efficient utilization of diagnostic studies and appropriate management of these cases cannot be overemphasized.<sup>4,5</sup>

The outcome as decided by Glasgow outcome scale devised by **JENNET and BOND (1975)**<sup>6</sup> was correlated with clinical and radiological factors. Studies done across the world have revealed that outcome in severe head injury are poor.

In present study 10% patients expired, 1% Vegetative state, 2% severe disability, 3% had moderate disability and 84% had a good recovery. The GCS was developed by **Teasdale and Jennett** in 1974 as an objective measure of the level of consciousness<sup>7</sup>. It has since become the most widely used clinical measure of the severity of injury in patients with severe traumatic brain injuries (TBIs). A number of studies have confirmed a fairly high degree of inter- and intra-rater reliability of the scale across observers with a wide variety of experience .

It is a component of the Acute Physiology and Chronic Health Evaluation (APACHE) II score, the (Revised) Trauma Score, the Trauma and Injury Severity Score (TRISS) and the Circulation, Respiration, Abdomen, Motor, Speech (CRAMS) Scale, demonstrating the widespread adoption of the scale. In present study ,GCS has shown good correlation with Glasgow outcome score. There was consistent improvement in outcome with increasing score of GCS.

**Conclusion:**

Glasgow Coma Scale and its application early at casualty, Intensive Care Unit, pre and post operative period facilitates the assessment and recording of Severity Brain dysfunction and ultimate outcome.

**References:**

- [1] Chantal Hukkelhoven. Prognosis after traumatic brain injury, Erasmus MC, University Medical Center Rotterdam – With summary in English and Dutch 2005;(6)
- [2] Ko DY. In Clinical evaluation of patients with head trauma. Clin N Am 2002; 12 (2)165-174.
- [3] Riegler J, Linesenmaier U, Pfeifer M. Radiological diagnosis in acute craniocerebral trauma. Radiologe, 2002 ; 42 (7) : 547-55.
- [4] Udsteun GJ, Claar JM. Imaging of acute head injury in the adult. Seminar in Ultrasound CT MR, 2001 ; 22 (2): 135-147.
- [5] Kido DK, Cox C, Hamill RW, Rothenberg BM, Woolf PD. Traumatic Brain Injuries :Predictive Usefulness of CT. Radiology 1992 ; 182 (3): 777-781.
- [6] Philip T Munro, Rik D Smith, Timothy R J Park. Effect of patients' age on management of acute intracranial haematoma: prospective national study, e, Nov 2002;325:1001 BMJ Volume 325 2 (1-5)
- [7] Segun T Dawodu. Traumatic Brain Injury (TBI) - Definition, Epidemiology, Pathophysiology, <http://emedicine.medscape.com/article/326510-overview> dated Mar 06 2013