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# Management of head injury patients in a General Intensive Care Unit (GICU) with no neurosurgical service

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RUJUKAN

## **Background and introduction:**

Our hospital is a referral hospital for a region having a population of 1.8 million, and incidents of motor-vehicle accidents of about 11 700 per year. HI patients are managed by the general surgeons who had neurosurgical experience of a variable experience, together with the anaesthetists who are in charge of the General Intensive Care Unit (GICU).

## **Objective:**

To determine the incidence and outcome of the patients sustaining head injuries who were managed in the GICU.

## **Methods:**

1. A prospective study of HI patients, who were admitted to the GICU, was done over a three months' period.
2. On admission to the Accident & Emergency (AE) Department, and following resuscitation , the pulse , blood pressure and respiratory rate were taken. The patients' neurosurgical status was given scores based on Glasgow Coma Scale (GCS).

3. Skull radiology and computerized tomography (CT) scans of the head were performed on all the patients.
4. The decision for the operation was made by the surgeon on-call, which depended on the clinical and CT scan findings.
5. Mannitol 1-2 g/kg was infused at the AE department or in the wards.
6. In the GICU, all the patients (operated and non-operated) were paralysed, ventilated and sedated for 24-48 hours.

7. Oxygenation and positive pressure ventilation were adjusted to keep the partial pressures of arterial oxygen more than 100 mmHg and carbon dioxide between 35-40 mmHg.
8. To control ICP in the GICU, all the patients were infused with hypertonic saline (3% and 20% saline) to maintain serum sodium level at 150-155 mmol/L.
9. Catheter for ICP monitoring (when indicated) was inserted intraoperatively or in the GICU itself.

10. The GCS of the patients were also taken when discharged from the GICU as well as before returning home from the wards. These scores were used to estimate the outcome.

## **Results:**

1. A total of 34 HI patients (out of 106 GICU admission), 25 males and 9 females, were managed during the study period. All, but one, were due to motor-vehicle accidents.
2. 13 patients were operated and 21 not operated.
3. 30 patients (88.2%) were below the age of 50.

4. The mean length of stay in the GICU was 85.6 hours, the shortest was 11 hours (the patient died) and the longest 253 hours (also died).
  
5. There were 7 deaths in the GICU (20.58%): 3 operated and 4 non-operated; and 5 patients (14.7%): 3 operated and 2 non-operated, were discharged from the GICU with GCS less than 8. All these five patients died in the wards later on. 22 patients (64.7%): 7 operated and 22 non-operated, made full recovery or GCS more than 8.

**Table 1: Operated patients**

<b>Type of lesion</b>	<b>Patients (n)</b>	<b>Death in GICU</b>	<b>Death in wards</b>	<b>Discharged home</b>
Extradural haemorrhage	5	2	1	2
Subdural haemorrhage	7		2	5
Combined haemorrhage	1	1		

**Table 2: Non-operated patients**

<b>Type of lesion</b>	<b>Patients (n)</b>	<b>Death in GICU</b>	<b>Death in wards</b>	<b>Discharged home</b>
Intracerebral haemorrhage	5	3		2
Combined haemorrhage	8	1	1	6

*Cerebral  
oedema*

8

1

7

**Table 3: Operated patients**

	<b>Patients (n)</b>	<b>Death in GICU</b>	<b>Death in wards</b>	<b>Discharged home</b>
GCS of 8 and below	8	2	3	3
GCS of 9 to 12	5	1		4

**Table 4: Non-operated patients**

	<b>Patients (n)</b>	<b>Death in GICU</b>	<b>Death in wards</b>	<b>Discharged home</b>
GCS of 8 and below	13	4	1	8
GCS of 9 to 12	8		1	7

## **Discussion:**

1. The use of hypertonic saline to control ICP is controversial. There is no double blind study yet comparing it with the commonly used drugs such as mannitol.
2. Because of the economic and social background, it is almost impossible to do follow-up and to find the real Glasgow Outcome Scale (GOS), once the patients were discharged from the hospital.

3. In this study, efforts were made to ensure that the patients could look after themselves before they were discharged home.

## **Conclusions:**

The management of HI patients in the GICU has produced a good outcome. The shortage of neurosurgeons could be overcome by a dedicated team of general surgeons, anaesthetists and nurses.