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Surgery

Demographics, Outcomes and Management of Head Injury: A General Surgeon Perspective

Dr. Anil Kumar[1], Dr. Vipin Raj[2]*
[1]Assistant Professor, Department of Surgery, SHKM, GMC, Haryana, India
[2]Senior resident, Department of surgery, SHKM, GMC, Haryana, India

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***Corresponding author**
Dr. Vipin Raj

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Abstract: Head injuries are one of commonest reason for patients for emergency consultation to almost every hospital. The lack of consensual protocols and clinical guidelines can lead to deficiencies in the attention to these patients and to inadequate use of resources. Our aim was to study those factors that lead us to the decision of performing a CT scan and to clarify if that decision is the most appropriate not only for the patient but for the hospital as well and to analyze various pathological findings presented to our tertiary care center from a general surgeons perspective**.** Between September of 2017 and March of 2018, all the patients presenting at our emergency department claiming a head injury were studied. The mechanism of injury, the neurological status and GCS at the arrival as well as ct head findings was recorded. A total of 250 patients were selected for the study. History and complete systemic examination should be thoroughly practiced as the patients having low GCS score have a high incidence of abnormal scans on imaging studies .CT is the method of choice for detecting intracranial as well extra cranial pathological conditions that may or may not require surgery. Motor vehicle accidents are the leading cause of head trauma in our region. There should be strict implementation of the traffic laws by the government and control of interpersonal violence by legal authorities.
Keywords: head injury, CT scan in head injury.

INTRODUCTION

Head injuries are one of commonest reason for patients for emergency consultation to almost every hospital. In- spite for such a prevalent problem fixed protocol for its diagnosis and management are still lacking causing high morbidity and mortality. The lack of consensual protocols and clinical guidelines can lead to deficiencies in the attention to these patients and to inadequate use of resources. CT scan is a necessary diagnostic tool in patients with traumatic brain injury.

To standardize those conditions in which CT head should be done the following is proposed:

The New Orleans Criteria (GCS: 15/15): CT head should be performed if the patient is having any of the following conditions following head injuries:

- Headache
- Vomiting
- Older than 60 years old
- Drug or alcohol intoxication
- Persistent anterograde amnesia (deficits in short-term memory)
- Visible trauma above the clavicle
- Seizure

Canadian CT Head Rule

CT head is required for patients with minor head injury when any 1 one of the following findings is described:

- GCS:13/15 (except patients who are taking warfarin or have bleeding disorders and patients with open skull fracture)
- Witnessed loss of consciousness
- Amnesia
- Confusion

High risk for neurosurgical intervention exists when:

- GCS<15 two hours after head injury
- Suspected open or depressed skull fracture
- Signs of basal skull fracture (hem tympanum, raccoon eyes, cerebrospinal fluid, logorrhea or rhinorrhea, Battle's sign)
- Two or more episodes of vomiting

- Patients ≥ 65 years old

Medium risk for brain imaging detection by CT imaging:

- Amnesia before impact for 30 minutes or more
- Dangerous mechanism of head impact

General surgeons are first attending specialist doctor for treatment and management of all sorts of head injuries in our center. In Britain, emergency doctors are routinely involved in the early management of head injured patients. At least a third of major emergency units in the UK have short stay facilities and, although the case mix is very varied, the most common category of patient routinely admitted is minor head injury [1]. There is ongoing debate particularly on the question of which specialty should be responsible for the first 48 hours of adult head injury care. Many general surgeons feel inadequately trained for the role and with the new specialty registrar programmers it will be extremely unusual for new consultants in surgery to receive formal training in neurosurgery as part of their higher surgical training[2].

Although general surgeons still look after most admitted head injuries but studies suggests that surgeons are unsuited to this role and should hand over responsibility entirely to accident and emergency (A&E) specialists and neurosurgeons[3].

Our aim was to study those factors that lead us to the decision of performing a CT scan and to clarify if that decision is the most appropriate not only for the patient but for the hospital as well and to analyze various pathological findings presented to our tertiary care center from a general surgeons perspective.

MATERIALS AND METHODS

Between September of 2017 and March of 2018, all the patients presenting at our emergency department claiming a head injury were studied. The mechanism of injury, the neurological status and GCS at the arrival as well as the specialty of the doctor who first evaluate the patient were recorded. Finally the decision-making criteria for a CT scan were evaluated in combination with the results of this examination. A total of 250 patients were selected for the study

Inclusions criteria

All patients of road traffic accidents, assaults, fall from height stating head injury.

Exclusion criteria

- Patients refusing to be a part of study.
- Patients of HIV, HBsAg, HCV status positive.
- Patients having severe systemic comorbidities
- All pregnant women. (Based on previously performed ultra- sound or last menstrual period).
- 5: Patients on warfarin or on anticoagulant therapy.

OBSERVATIONS AND RESULTS

Table-1: Classification of patients according to mechanism of trauma

Serial number	Mechanism of head injury	Number of patients	Percentage
1	Road traffic accidents	122	49%
2	Fall from height	82	33%
3	Physical assault	33	13%
4	Other causes	13	5%

Table-2: Classification of patients according to GCS status at the time of admission

Serial number	Severity of head trauma	GCS status at presentation	Number of patients	Percentage
1	Normal consciousness	15	178	71%
2	Mild head injury	13-14	35	14%
3	Moderate head injury	8-12	27	11%
4	Severe head injury	Less than 8	10	4%

Table-3: Classification of patients according to different CT head findings

Serial number	CT head findings	Number of patients	Percentage
1	Contusion	13	5%
2	EDH	7	3%
3	SDH	5	2%
4	Skull fracture only	23	9%
5	Normal study	202	81%

Table 4: Age distribution of head injury patients

Serial number	Age group	Number of patients	Percentage
1	0-10	27	11%
2	11-20	23	9%
3	21-30	93	37%
4	31-40	82	33%
5	41-50	17	7%
6	51 and above	8	3%

Classification of patients according to treatment plan:-

- Conservative management by general surgeons : 221
- Neurosurgeon consultation and further management : 29

Image-1: CT head showing EDH

Image-2: CT head scan showing skull fracture

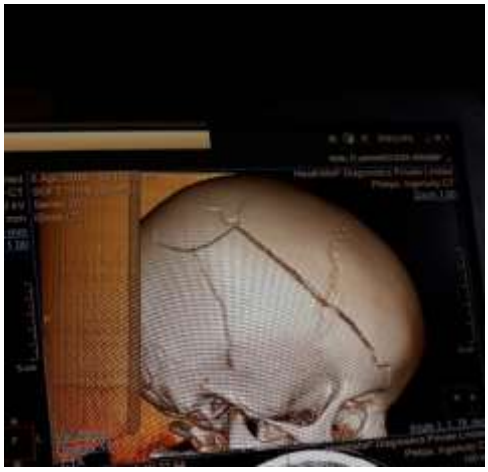

Image-3: CT reconstructed image showing bone fracture

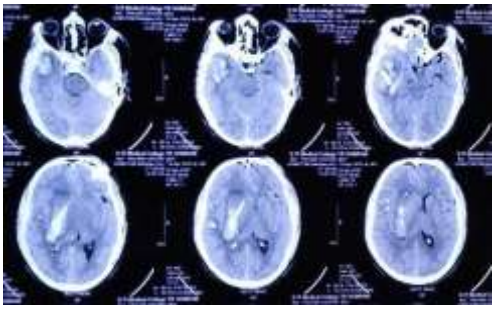

Image-4: CT head showing contusion with midline shift and pneumocephalus

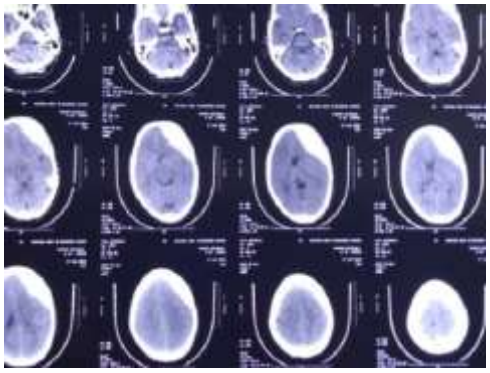

Image-5: CT head showing frontal EDH with midline shift

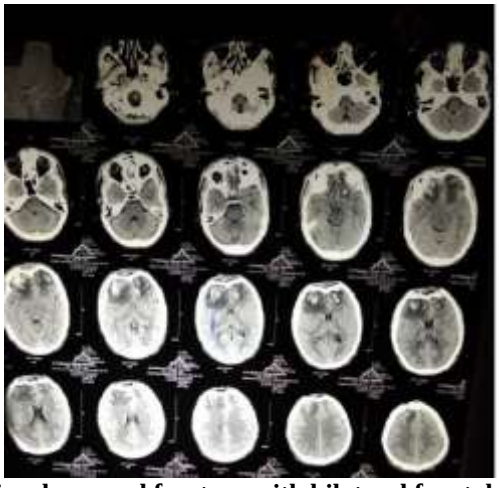

Image-6: CT head showing anterior depressed fracture with bilateral frontal contusion with perilesional edema

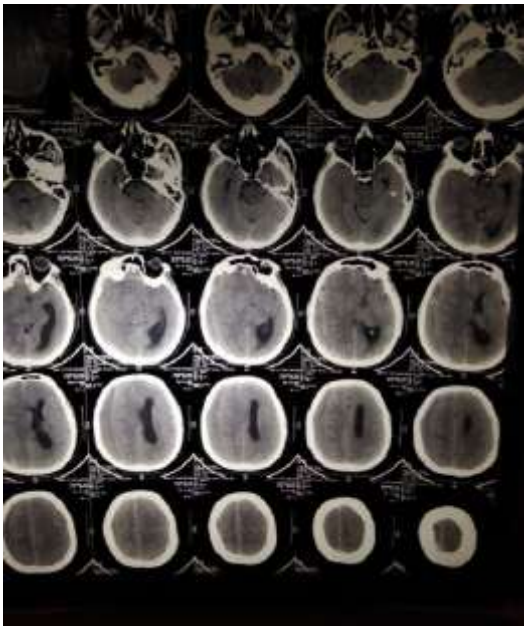

Image-7: CT head showing Chronic SDH (subdural hemorrhage) with right side with midline shift

DISCUSSION

In our study most common mechanism of causation was all sort of road traffic accidents by all types of vehicles two, three wheelers etc which accounted for around 49 % and a total of 122 patients followed by fall from height with a number of 82 (33%) patients . Physical assault and head injury due to other causes accounted for 33(13%) and 13(5%) patients respectively.

It has been found that incidence for head injuries is increasing mainly due to usage of vehicles by low and middle income countries [4]. It has been observed that the cost of road crash injuries is quite large. It is estimated to be roughly 1% of gross National product (GNP) in low-income countries, 1.5% in middle-income countries and 2% in high-income countries [5]. In countries with low income like in Africa, Asia, the Caribbean and Latin America, RTAs are common among passengers, pedestrians, cyclists, occupants of buses and users of motorized two-wheelers [6, 7].

The second common cause in our study was falls which was more common in the elderly and pediatric age groups. The increased rate of physical assault was the third common cause of injury in our study which has been linked to illiteracy, poverty, unemployment, and poor law reinforcement capacities at our nearby localities.

Most of the patients in our study presented with a GCS score of 15/15 accounting for a total of 178 patients which constituted 71%. Patients having moderate to severe head injury having a low GCS score have a high incidence of pathological findings on CT head.

Similar findings were presented in study of Mary W. Lieh-Lai *et al*. [8] which demonstrated direct relationship between low GCS score and pathological findings on CT head.

In our study most of patients have a normal CT head findings followed by skull fracture in 23 patients (9%). Contusion, EDH, SDH accounted for 13(5%), 7(3%) 5(2%) patients respectively.

Similar study results were shown in study conducted by Bordignon Kelly C *et al*. [9] and others in there study maximum patients accounting for a percentage of 60.75% patients have a normal CT head findings other findings in there study were soft tissue swelling (8.9 %), skull fractures (4.3 %), intracranial and subgaleal hematomas (3.4% and 2.4 %), brain swelling (2 %) and brain contusion (1.2%) respectively.

In our study the highest frequency of head injury was in the age group of 21-30 yrs accounting which was 93 (37%) followed by 82 (33%) patients in age group of 31-40 yes. In study of Bordignon Kelly C *et al*. [9] the highest frequency of head injury occurred in the 21-30 years interval (25.1%), followed by the age groups 11-20 (21.6%) and 31-40 (17.5%). This may be due to increase mobility and activity of young age group

Out of 250 patients that were selected for our study 221 patients improved satisfactorily and only 29 patients needed neurosurgeon consultation.

CONCLUSION

History and complete systemic examination should be thoroughly practiced as the patients having low GCS score have a high incidence of abnormal scans on imaging studies .CT is the method of choice for detecting intracranial as well extracranial pathological conditions that may or may not require surgery. Motor vehicle accidents are the leading cause of head trauma in our region. Various studies have shown the beneficial effect of helmets, air bags and children seat-belts and should be thoroughly practiced. There should be strict implementation of the traffic laws by the government and control of interpersonal violence by legal authorities. Trauma centers should be built which should be equipped with modern instruments and professional staff with training of advanced trauma and life support programmes.

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