CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187
http://doi.org/10.5281/zenodo.4147495

Avalable online at: http://www.iajps.com *Research Article*

INTRACRANIAL CT-SCAN FINDINGS IN PATIENTS OF HEAD INJURY

Dr. Hamza Khalid[1], Dr. Aeman Hyder[2], Dr. Ambreen Shahnaz[3], Dr. Hina Anwer[4]

Article Received: August 2020 **Accepted:** September 2020 **Published:** October 2020

Abstract:
Introduction: *Traumatic brain injury (TBI) is an extremely common and potentially devastating problem.* ***Objectives:*** *The main objective of the study is to find the intracranial CT-scan findings in patients of head injury.* ***Material and methods:*** *This descriptive study was conducted in Punjab health Department during 2019. This is an analysis of prospectively recorded data of all head injury patients who presented for CT scanning. CT scan was recommended for all patients with moderate and severe head injury (GCS 3–12).* ***Results:*** *The data was collected from 357 patients. The mean age of the patients was 29.9±16.7 years, and 74.5% were male. The major causes of head injury were Road Traffic Accidents (RTAs; 59%), falls (18.7%) and assaults (12.9%). Majority of the injuries were of moderate severity with GCS 9–12.* ***Conclusion:*** *It is concluded that high yield and diversity of CT scan findings in head trauma patients justifies the appropriate use of CT in diagnosis and management of suspected head trauma patients.*

Corresponding author:
Dr. Hamza Khalid,

QR code

Please cite this article in press Hamza Khalid et al, ***Intracranial CT-Scan Findings In Patients Of Head Injury.,*** *Indo Am. J. P. Sci, 2020; 07(10).*

INTRODUCTION:

Traumatic brain injury (TBI) is an extremely common and potentially devastating problem. Studies have estimated that nearly 1.6 million head injuries occur in the United States each year, resulting in over 50,000 deaths and over 70,000 patients with permanent neurological deficits. TBI accounts for up to 10% of the health care budget and an estimated annual cost to society of $30 billion [1]. Because prompt proper management of TBI sequelae can significantly alter their course especially within 48 h of the injury, neuroimaging techniques, which can determine the presence and extent of the injury and guide surgical planning and minimally invasive interventions, play important roles in the acute therapy of TBI. Imaging also can be important in the chronic therapy of TBI, identifying chronic sequelae, determining prognosis, and guiding rehabilitation [2].

Head injury is a major health problem worldwide. In developing countries, the management is further worsened by factors like poverty, lack of medical insurance cover, availability and affordability of investigative and treatment modalities. The hospital where this study was carried out is located in Enugu with a population of about 723,000 [3]. Enugu is a referral center for the five south eastern states of Nigeria, but patients are also referred from other parts of Nigeria, especially the contiguous south–south and northern states [4].

Neuroimaging is, of course, costly and can consume scanner time that may be used for patients with other indications. Studies have found that less than 10% of patients that are considered to have minor head injuries have positive findings on CT and less than 1% require neurosurgical intervention. But this implies that there are still a small number of low risk patients that would benefit from neuroimaging. On the other hand, reducing the number of CT's performed on minor head injury patients even by 10% may yield more than $10 million in savings each year [5].

Objectives

The main objective of the study is to find the intracranial CT-scan findings in patients of head injury.

MATERIAL AND METHODS:

This descriptive study was conducted in Punjab health Department during 2019. This is an analysis of prospectively recorded data of all head injury patients who presented for CT scanning. CT scan was recommended for all patients with moderate and severe head injury (GCS 3–12). Patients who were graded GCS 13–15 were recommended for CT scan if there was clinical suspicion of intracranial complications such as focal neurological deficit, seizures and skull fractures or if the patients were intoxicated. CT scan was performed within 1 hour of arrival to the facility, but generally patients presented from 3 hours to 40 days post trauma. All scans were performed with 8-slice mobile CT scanner.

Brain CT scans were reviewed by the attending physician at the ED who had 5 years of experience. The main outcome measured was the presence of lesions related to the trauma in brain CT scan, which includes depressed fracture, base skull fracture, epidural hematoma, subdural hematoma, subarachnoid hemorrhage, pneumocephalus, and contusion.

The data was collected and analysed by analyst.

RESULTS:

The data was collected from 357 patients. The mean age of the patients was 29.9±16.7 years, and 74.5% were male. The major causes of head injury were Road Traffic Accidents (RTAs; 59%), falls (18.7%) and assaults (12.9%). Majority of the injuries were of moderate severity with GCS 9–12.

Table 01: Presence of abnormality in brain CT scan of patients with minor head injury

	Abnormal CT		*P* value (%)	PPV (%)	NPV (%)	Sensitivity (%)	Specificity
	–(%)	+(%)					
Male gender							
–	155 (94.5)	9 (5.5)	0.064	2.3	94.5	55	24.9
+	467 (97.7)	11 (2.3)					
Age >60							
–	577 (97)	18 (3)	0.652	4.3	97	10	92.8
+	45 (95.7)	2 (4.3)					
Headache							
–	527 (99.1)	5 (0.9)	0.000	13.6	99.1	75	84.7
+	95 (86.4)	15 (13.6)					
LOC or amnesia						95	68.3
–	197 (91.2)	19 (8.8)	0.000	8.8	99.8		
+	425 (99.8)	1 (0.2)					
TAC			1.000	2.4	96.8	5	93.6
–	582 (96.8)	19 (3.2)					
+	40 (97.6)	1 (2.4)					
Vomiting			0.021	8	97.5	30	88.9
–	553 (97.5)	14 (2.5)					
+	69 (92.0)	6 (8.0)					
Alcohol			0.091	33.3	97	5	99.7
–	620 (97.0)	19(3.0)					
+	2 (66.7)	1(33.3)					
Coagulopathy			1.000	0	96.9	0	99.8
–	621 (96.9)	20 (3.1)					
+	1 (100)	0 (0)					
Seizure			1.000	0	96.9	0	99.4
–	618 (96.9)	20 (3.1)					
+	4 (100)	0 (0)					
Age >60 and headache			0.009	40.0	97.2	10	99.5
–	619 (97.2)	18 (2.8)					
+	3 (60.0)	2 (40.0)					
Age >60 and LOC or amnesia			0.048	11.1	97.1	0.1	97.4
–	606 (7.1)	18 (2.9)					
+	16 (88.9)	2 (11.1)					
Age >60 and TAC			1.000	0.0	96.9	0.0	99.7
–	620 (96.9)	20 (3.1)					
+	2 (100)	0 (0)					
Age >60 and coagulopathy			1.000	0.0	96.9	0.0	99.8
–	621 (96.9)	20 (3.1)					
+	1 (100)	0 (0)					
Headache and vomiting			0.016	16.7	97.3	15	97.6
–	607 (97.3)	17 (2.7)					
+	15 (83.3)	3 (16.7)					
Headache and TAC			0.031	100	97	5	100
–	622 (97.0)	19 (3.0)					
+	0 (0)	1 (100.0)					
Vomiting and LOC or amnesia			0.000	8.7	99.8	95.0	67.8
–	422(99.8)	1 (0.2)					
+	200(91.3)	19 (8.7)					
Vomiting and TAC			1.000	0.0	96.9	0.0	99.5
–	619 (96.9)	20 (3.1)					
+	3 (100)	0 (0)					
Vomiting and seizure			1.000	0.0	96.9	0.0	99.8
–	621 (96.9)	20 (3.1)					
+	1 (100)	0(0)					
LOC or Amnesia and TAC			0.000	8.8	99.8	95.0	68.2
–	424 (99.8)	1 (0.2)					
+	198 (91.2)	19 (8.8)					
Headache and LOC or amnesia			0.000	8.6	99.8	95.0	67.5
–	420 (99.8)	1 (0.2)					
+	202 (91.4)	19 (8.6)					

Table 02: Types of Head injuries

Type of accident	Number	Age (mean±SD) years	Sex ratio (M:F)
Aggression	357	30.5 ± 13.0	4.1:1
Falls	347	27.9 ± 20.4	1.6:1
Automobile	324	29.2 ± 13.4	2.0:1
Fall to the ground	262	44.6 ± 25.9	1.3:1
Pedestrians	259	28.4 ± 19.1	1.5:1
Bicycle	153	21.5 ± 12.1	4.7:1
Direct impact	100	26.1 ± 17.7	2.0:1
Epilepsy	71	37.9 ± 16.1	2.7:1
Motorcycle	64	25.6 ± 9.4	3.3:1
Syncope	49	42.3 ± 21.7	1:1.1

DISCUSSION:

Head injury is a major world health problem. Several reports point automobile accident as the most important cause of HT. Motor vehicle accident causes HT about 35% to 60% in diverse series, and is usually a leading cause of serious injuries with head trauma in youth and middle age people and a common cause of morbidity and mortality related to trauma [6]. They are also the most frequent cause of death in individuals from 1 to 35 years of age [7]. Previous studies of head trauma in the United States demonstrated traffic accidents accounting for about half the fatal cases [8]. Other series show automobile accidents as a major cause of HT. In Massachussets, USA, 33.4% of causes were related to automobile accidents [9]. In our series, we only observed 16.2% of automobile accidents in mild HT. Automobile accidents may be less common in low socioeconomic populations due to limitation of owning a car. In fact, a study of Taiwan did not find very significant figures for automobiles, because motorcycle is the most common means of transport in that country [10].

In developed countries, a CT scan is even recommended for patients with mild head injury because one in five patients will have an acute lesion detectable by CT scanning. However, this is not universally accepted. Some authors believe that a thorough clinical examination of the patient may obviate the need for what they feel is an inefficient use of CT scan in head injury [11]. Others support the view that clinical examination in head-injured patients may not reliably predict the eventual CT scan findings [12]. Interestingly, increasing concern is being expressed about the hazards of CT and the need for moderation in its use even in head injuries. An earlier study from Nigeria in patients with moderate to severe head injury showed that 87% of patients had abnormal CT findings [13].

CONCLUSION:

It is concluded that high yield and diversity of CT scan findings in head trauma patients justifies the appropriate use of CT in diagnosis and management of suspected head trauma patients.

REFERENCES:

1. Da Silva PS, Reis ME, Aguiar VE. Value of repeat cranial computed tomography in pediatric patients sustaining moderate to severe traumatic brain injury. J Trauma. 2008;65:1293–7.
2. Ghebrehiwet M, Quan LH, Andebirhan T. The profile of CT scan findings in acute head trauma in Orotta Hospital, Asmara, Eritrea. J Eriterean Med Assoc. 2009;4:5–8.
3. Harad FT, Kerstein MD. Inadequacy of bedside clinical indicators in identifying significant intracranial injury in trauma patients. J Trauma Inj Infect Crit Care. 1992;32:359–63.
4. Kara A, Celik SE, Dalbayrak S, Yilmaz M, Akansel G, Tireli G. Magnetic resonance imaging finding in severe head injury patients with normal computerized tomography. Turk Neurosurg. 2008;18:1–9.
5. Khan S, Khan N, Masood S, Rana AQ. Evolution of traumatic intracerebral hemorrhage captured with CT imaging: Report of a case and the role of serial CT scans. Emerg Radiol. 2010;17:493–6.
6. Kyu WH, Feinstein A, Colantonio A, Streiner DL, Dawson D. Regional variability in the use of CT for patients with suspected mild traumatic brain injury. Can J Neurol Sci. 2009;36:42–6.
7. Laalo JP, Kurki TJ, Sonninen PH, Tenovuo OS. Reliability of diagnosis of traumatic brain injury by computed tomography in the acute phase. J Neurotrauma. 2009;26:2169–78.
8. Nagy KK, Joseph KT, Krosner SM, Roberts RR, Leslie CL, Duffy K, et al. The utility of CT scan after minimal head injury. J Trauma Inj Infect Crit Care. 1999;46:268–70.
9. Roudsari B, Moore DS, Jarvik JG. Trend in the utilization of CT for adolescents admitted to an adult level 1 trauma center. J Am Coll Radiol. 2010;7:796–801.
10. Shackford SE, Wald SL, Ross SE, Cogbill TH, Hoyt DE, Morris JA, et al. The clinical utility of CT Scan and neurologic examination in patients with minor head injury. J Trauma. 1992;33:385–94.
11. Stein SC, Fabbri A, Servadei F. Routine serial computed tomographic scans in mild traumatic brain injury: When are they cost-effective? J Trauma. 2008;65:66–72.
12. Thomas BW, Mejia VA, Maxwell RA, Dart BW, Smith PW, Gallagher MR, et al. Scheduled repeat CT scanning for traumatic brain injury remains important in assessing head injury progression. J Am Coll Surg. 2010;210:824–32.
13. Miller EC, Holmes JF, Derlet RW. Utilizing clinical factors to reduce head CT scan ordering for minor head trauma patients. J Emerg Med. 1997;15:453–7.