

A descriptive study of cranio-cerebral injuries admitted in tertiary care center of coastal Andhra Pradesh

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Abstract: *Introduction:* Demographic and clinical profile of traumatic brain injury (TBI) of a particular place is very crucial for strengthening the guidelines. The details of same are scant from a tertiary institute, Nellore district. The present study aims to explore the demographic, injury and clinical aspects of cerebro-cranial injury patients from an institute setup. *Methods:* The study consists of two years retrospective data and one year prospective data. The study was approved by institute ethical committee. The patient data was entered on pre designed proforma that includes the desired variables. The data analysis was done using StatsDirect software. Both prospective and retrospective data was merged for analysis. Percentages for categorical data and mean values for continuous data were calculated. *Results:* There were total of 336 patients. Patients in age group of 21 to 50 years constituted 67% and males were four times higher than females. Nearly one fourth of patients were influenced by alcohol. Three fourth of accidents were due to road traffic accidents (RTAs) followed by falls (17%) and assault (6%). About one tenth of patients were pedestrians. One fourth of patients had associated injuries other than head and brain. On CT findings majority of patients had cerebral contusion (46%) followed by skull fracture (40%), SDH (28%) and EDH (23%). Twenty two patients died in the study period. *Conclusion:* Knowledge of injury and its later consequences to public is very important. Strict rules to consider safety precautions and compulsory family insurances should be encouraged. Rules to prevent paediatric drive.

Key words: Age, gender, TBI, institute, CT findings, urban, RTA, guidelines

Introduction

Traumatic brain injury (TBI) has long been recognized as a leading cause of mortality and permanent neurological disability worldwide and has been described as a silent and causing a significant social and financial burden for them, their families and the public health system. [1] In year 2014 The National Crime Report Bureau reported that there were a total of 4,81,805 traffic accidents and out of these 4,50,898 were road accidents which were responsible for 1,41,526 deaths. [2] In India, road traffic injuries projected to become the second leading cause of death by the year 2020. [3] There are few studies from India that have described the epidemiology of TBI and discussed related issues, including the need for public awareness campaigns and enforcement of legislation to reduce the number of injuries. [4-8] Most of these studies have been conducted in different parts of country at institute level and the present study is aimed to describe epidemiological characteristics, pattern of injuries and related clinical parameters of TBI from a tertiary care setup located in the coastal area of southern India.

Materials and Methods

Narayana Medical College and General Hospital is a multi and super specialty hospital located in costal Andhra district, Nellore. It is a three years study that included data from 2011 to 2014. The study was approved by Institute Ethical Board. The data was collected on a standard proforma. The proforma includes details of age, sex, causes

of head injury, pattern of head injuries, Computer Tomography (CT) findings like skull fractures, parenchymal injuries, intracranial hemorrhages, and discharge outcome (alive or death).

Statistical analysis

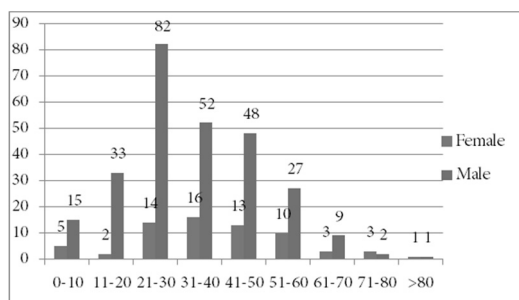
The data analysis was done using StatsDirect version 3.0.150 (StatsDirect statistical software. <http://www.statsdirect.com>. England: 2015). For analysis both retrospective and prospective data was combined together. Percentages were calculated for categorical data, and mean, standard deviation was calculated for continuous data.

Results

During study period there were 336 cases, of them 116 were prospective and 220 were retrospective cases. The mean age was 35.05 ± 16.36 years. Sixty seven percent of patients were in 3rd, 4th and 5th decade of age group (figure 1). Males were four times more than females. About 50% of patients were from urban setup. Sixty six percent of injuries occurred on road. About 75 patients (22.3%) were influenced by alcohol (Table-1).

Table 1 - Demographic variable of cranio cerebral injury patients

Variables	n (%)
Age (years)	35.05 ± 16.36
Gender	
Male	269 (80)
Female	67 (20)
Location of injury	
Urban	169 (50.3)
Rural	167 (49.7)
Place of injury	
Road	224 (66.7)
Home	47 (14)
Streets	25 (7.4)
Fields	11 (3.3)
Others	29 (8.6)
Alcohol influence	
Yes	75 (22.3)

**Figure 1** - Decade wise distribution of TBI patients

Road Traffic Accidents (RTAs) was major cause of injury accounting for 75.6%, followed by falls (17.9%) and assault (6%). Among RTAs the motorcycle victim was affected in higher number (42.3%) followed by motor vehicle driver (15.2%) and pedestrian (12.2%). None of two wheelers worn helmet while riding vehicle. Two wheeler was most common victim vehicle (54.8%) followed by four wheeler (4.8%) and

three wheeler (4.5%). Associated injuries were present among 23.3% of patients (Table-2).

Table 2 - Details of mode and associated injuries among traumatic brain injury

Variables	n (%)
Cause of injury	
Road Traffic Accident (RTA)	254 (75.6)
Fall	60 (17.9)
Assault	20 (6)
Object fall	2 (0.6)
Accident victim among RTA	
Motorcycle rider	142 (42.3)
Motor vehicle driver	51 (15.2)
Pedestrian	41 (12.2)
Passenger	20 (6)
Associated injuries - present	
Extremities fracture	45 (13.4)
Lung and Pleura	11 (3.2)
Cervical spine	21 (6.3)
Dorsal spine	1 (0.3)
External injuries of head	
Scalp	278 (82.7)
Face	213 (63.4)

On CT findings; 40% of patient had skull fractures. Among intra cranial brain lesion, brain contusion (45.8%) was present among majority of patients, followed by SDH (28.5%) and EDH (23%). Midline shift was present among 13% of patients (Table-3). During the study period 22 (6.5%) patients died.

Table 3 - CT scan findings among traumatic brain injuries

Variables	n (%)
Skull fracture	135 (40.1)
Right	62 (46)
Left	53 (39.2)
Bilateral	16 (11.8)
Midline	4 (3)
Extra Dural Hematoma (EDH)	77 (23)
Right	38 (49.3)
Left	33 (42.8)
Bilateral	3 (3.8)
Sub Dural Hematoma (SDH)	96 (28.5)
Right	52 (54.1)
Left	36 (37.5)
Bilateral	4 (4.1)
Brain contusion	154 (45.8)
Right	60 (39)
Left	50 (32.4)
Bilateral	35 (22.7)
Midline	9 (5.8)
Coup brain injuries	77 (23)
Contre-coup injuries	35 (10.4)
Midline shift	44 (13.1)

Discussion

The current study is conducted in a tertiary care hospital that provides medical service to main city and surrounding villages and districts. In present study about two third of patients were in 3rd-5th decades of life and out of these two thirds were males belonging to the financially productive age group and reflect the vulnerability of this age group and gender for accidents.[9,4,6,7,10-13] There was equal number of patients from urban and rural areas reflecting the proximity of the hospital to both city and surrounding villages. [14] The alcohol consumption was more prevalent male patients and there were more

of assault patients (30%) followed by RTA patients (26.5%).as previously reported [15, 16] The same scenario is reflected from our study regarding the time of the day and injury incidence which is commonly reported between 5-9 PM probably these are the peak traffic hours in cities. [3,7,12,17].

In the present study road traffic accidents were the commonest cause of injuries followed by falls and assault and in literature the incidence of injuries from RTAs ranges from 55 to 72%, followed by falls ranging from 20 to 30% and assaults ranging from 1 to 10% respectively. [5,18-22]

Most of the incident victims were motorcycle riders (skid and fall) followed by motor vehicle drivers and pedestrian injuries These findings were similar to the findings reported in a prospective case-study from Eastern China where the authors observed that 61% of traumatic brain injuries were related to road traffic injuries, of these approximately one-third were motorcyclists, 31% pedestrians, and motor-vehicle passengers accounted for only 14%. [5] In another study from Maharashtra the studied pattern of fatal vehicular accidents involving head injuries during 2010-2012 and observed that most of the victims were drivers (52.5%), followed by pedestrian (29.7%) and passengers (17.8%). [3]

Another interesting finding in our study was the pattern of fall from height related injuries which involved mainly farmers where the victims were fallen down from coconut tree and the other common reason was fall from height at construction sites.

Old people are commonly affected in ground level fall because of age related disabilities they spend most of the time in home where accidental falls are common in home. Fall from tree was next common due to inexperience or weather changes cause alteration in tree texture. A study from US during 2001-2008 and observed a large majority of fall injuries occurred at home (72.8%), while 15.2% occurred at locations outside the home. 23 A study found falls from heights were responsible in 48.9%, slipping in bathrooms in 31.9% and from staircase or ladders in 19.2%. These findings are consistent with our study. In the present study CT findings reports that skull fractures were present in 135(40.1%) cases and 97 (28.8%) had base of skull fracture. Studies have reported 34 to 35% of skull fractures among TBI patients. [13,24] Abnormal intracranial findings were; brain contusion was present in 154(45.8), SDH in 98(28.5%) and EDH in 77(23%). Studies have reported cerebral contusion ranging from 21 to 53% [6,19,25,26], high percentage of SDH ranging from 50 to 90% [19,27,28] and about 10 to 20% EDH. [19,27,28]

In the present study nearly one fourth of TBI patients had associated injuries. Extremities was most common to involve (13.4%) followed by spine (6.6%) and chest (3.2%). Pedestrian injuries from a tertiary institute reported 90% of associated injuries (new). The current study reported less percentage of associated injuries the reason for the same is not clear. Possibly only TBI patients were referred to the trauma centre. Limitations of the study are; the sample

population is limited and sample size is small. Simple statistics is used.

Conclusions

The three year study from a tertiary centre on TBIs highlights that 3rd, 4th and 5th decade of age group is commonly affected with male predominant. One fourth of injured patients are influenced by alcohol. RTA is a major cause of TBI accounting for 75%, followed by falls and assault. The incidence of head injuries is almost equal in rural and urban areas. Twelve percent of patients are pedestrians. Two wheelers were the commonest vehicle involved in road traffic accidents and the most common mechanism of accident was skid and fall from bike and the commonest victims were motorcycle riders. Home was the commonest place of incidence of fall from height and ground level falls. On CT findings cerebral contusion was most common, followed by skull fracture, SDH and EDH. Death was reported among 6.5% of patients. Public awareness about TBI consequences and possible preventable measures that can benefit general population is detailed from the demographic and clinical details.

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