

Epidemiology and Demographic Profile of Operative Traumatic Brain Injuries presenting to Emergency: An Observational Study at a Tertiary Care Facility in East Godavari District, Andhra Pradesh

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ABSTRACT

In this era of urbanization and motorization, Traumatic Brain Injuries have emerged as a challenge to the modern society and has varied economic, social and medical implications. There are numerous factors like age, sex, mode of injury to admission interval, alcoholism, co-morbidities and severity of injury among others, that have an impact on the survival of Traumatic Brain Injury patients. The present study was designed to study the epidemiology and the demographic profile of patients presenting with operative Traumatic Brain Injury planned for decompressive craniotomy at a tertiary care centre in East Godavari district of South India.

Keywords: epidemiology, demographic, decompressive craniotomy, two-wheeler RTA, Traumatic Brain Injuries (TBIs)

INTRODUCTION

Since the start of the 21st century, India has been emerging as one of the major economies of the world. In the process of rapid urbanization, motorization and changing socio-economic equation, a number of health problems have also emerged with a significant increase in the number of Traumatic Brain Injuries (TBI). India being the second largest in world population, over a quarter of the world's trauma deaths occur here. RTAs are the leading cause of Traumatic Brain Injuries (60%), followed by falls (20-25%) and assault (10%). Alcohol involvement is also a common association among 15-20% of TBIs.¹

In a large study of patients involved in trauma, it was found that the presence of head injury resulted in a 1.5 times increase in death when compared with mortality due to other injuries.² There are numerous factors that decide the fate of TBI patients, namely age, sex, mode of injury, injury to admission

interval, alcoholism, co-morbidities and severity of injury among others. In view of increasing incidences regarding TBI particularly in south India, there are fewer studies reporting their scenarios in TBI which made us to undertake this study. The present study was designed to study the epidemiology and the demographic profile of patients presenting with operative TBI planned for decompressive craniotomy.

.MATERIALS AND METHODS

It was a prospective study conducted at the Department of Neurosurgery, Rangaraya Medical College, Kakinada during the period of December 2018 to January 2021. About 200 patients admitted with operative traumatic brain injuries to the department and planned for decompressive craniectomy were taken into the study, considering

their age, sex, co-morbidities, mode of injury, clinical assessment, radiological evaluation and indications for surgery. Patients of TBI who were previously operated, operated elsewhere and conservatively managed cases were excluded.

Clinical diagnosis of TBI was made by the treating surgeon, based on presenting symptoms of headache, vomiting, seizures or any other feature suggestive of raised ICP. A complete neurological examination was done; all findings- GCS, pupillary reactivity, BP, PR, associated extracranial injuries were noted. Radiological assessment in the form of CT Brain after resuscitating the patient was then performed. The patients were subjected to further investigations for anaesthetic workup. As per the location of SDH/contusion and degree of midline shift, patients

were advised decompressive craniectomy. The patients/attendants had been explained regarding intraoperative complications, postoperative complications and follow up and after obtaining consent; the patients were operated and meticulously monitored in the post-operative period for any complication. The discharged patients were followed up in the outpatient department for a total post-operative period of 6 months.

RESULTS

The study included patients ranging from 10 years to above 70 years, however the majority were from the third, fourth and fifth decade of life (59%). There was a male dominance in the study (80.5%) with male to female ratio of 4.1:1.

Table 1: Age wise distribution

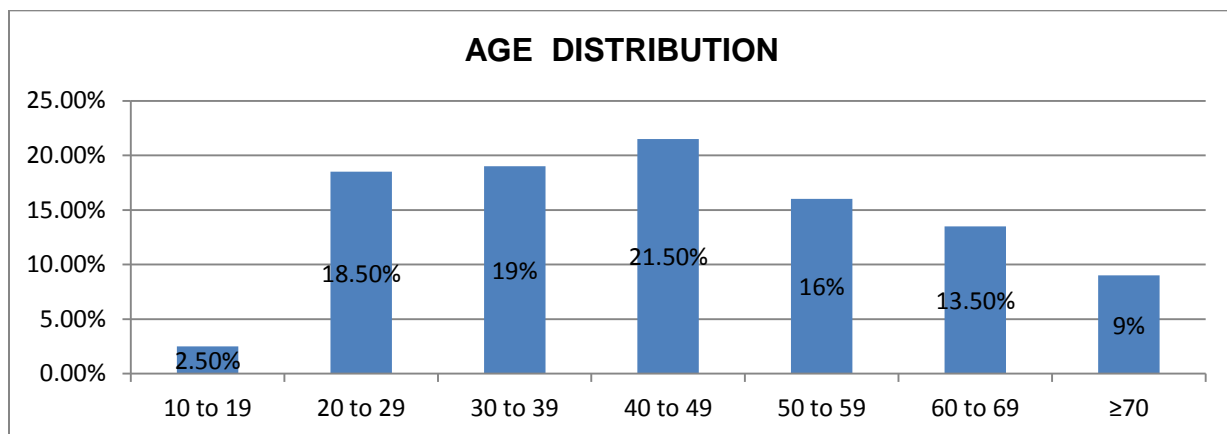
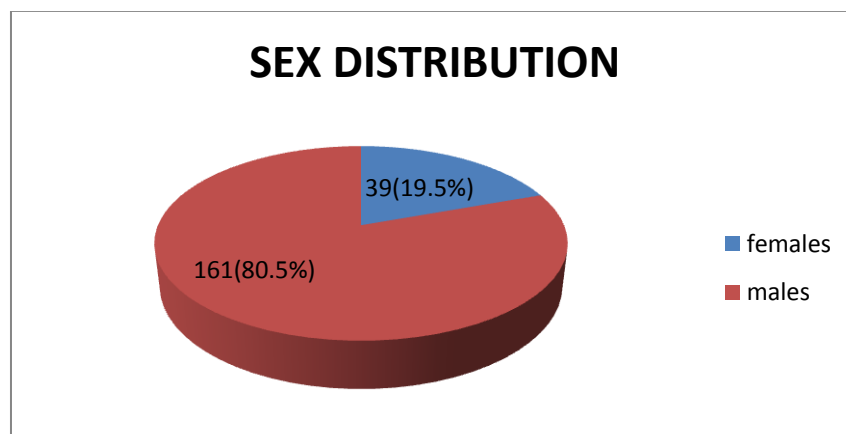


Figure 1: Sex Distribution

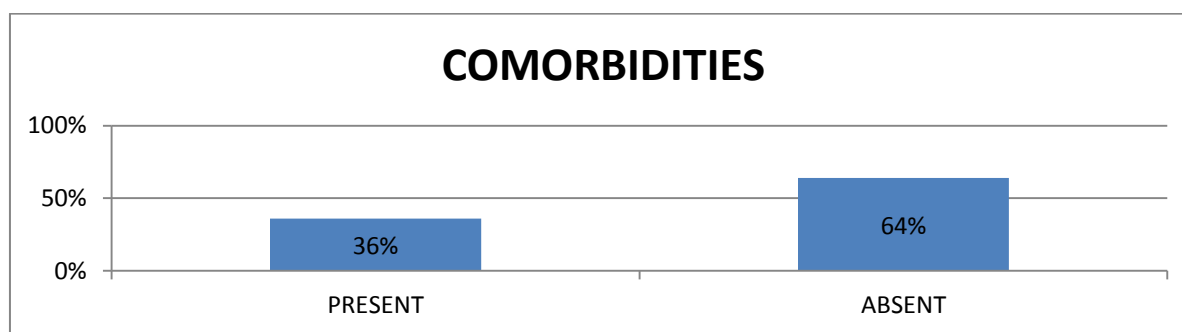


The most common mode of injury was due to RTA (82.5%); followed by self fall (13.5%) and assault (4%). Overall, two-wheeler RTA was the most common mode (61%). Self fall was the 2nd most common mode for patients in 5th decade and beyond; assault cases were mainly from 6th and 7th decade of life.

Table 2: Mode of Injury

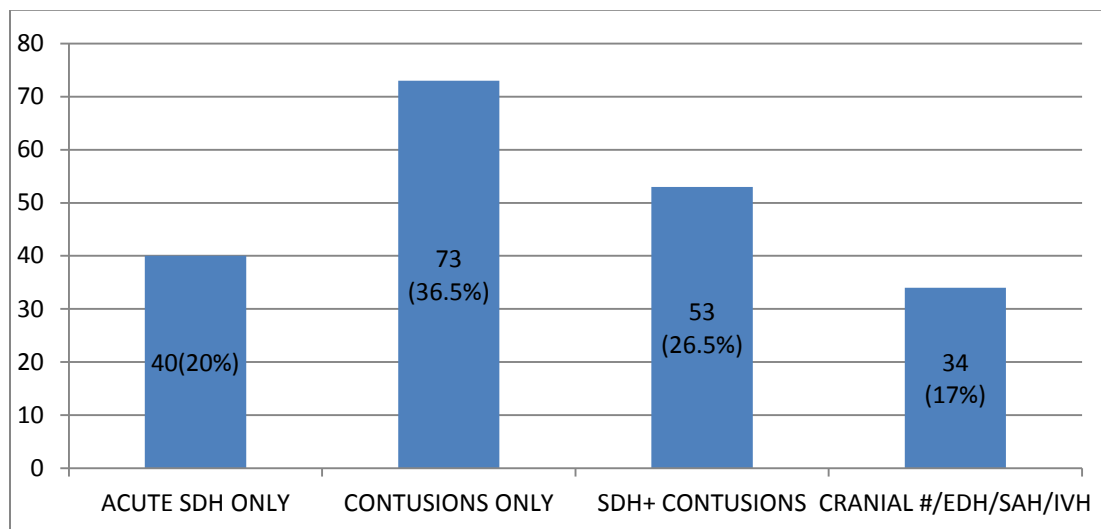
MODE OF INJURY	NO. OF PATIENTS	PERCENTAGE
RTA	165	82.5%
SELF FALL	27	13.5%
ASSAULT	8	4%

36% of the patients had co-morbidities. These included DM, Hypertension, CVA, epilepsy, etc out of which HTN was found to be the most common (66.7%), followed by DM (37.5%).

Figure 2: Distribution of Co-morbidities

Alcohol influence was seen in 47.5% cases.

Regarding CT findings, a large number of our patients had unilateral lesions (86.5%); 13.5% cases had bilateral lesions. Only contusions were present in 36.5%; acute sdh in 20% whereas 26.5% had both.

Figure 3: Distribution of CT Findings

The overall mortality rate in our study was 56% (112 deaths out of 200 operated cases). According to age [Figure 4], the highest mortality was reported in ≥ 30 years age group (56.3%). In modes of injury [Figure 6], two-wheeler RTA was the leading killer with the highest mortality (63.9%) mainly because it is the main mode of

transport in this region. Self fall had the lowest mortality (29.6%). In 72 patients with co-morbidities [Figure 5], only 26.4% survived. Diabetics with pre-existing HTN had 100% mortality; followed by pure diabetics with 94.7% mortality. Among alcoholics, only 42.1% survived. Highest death rate was reported in patients with GCS \leq 8 at admission (98.1%). Radiologically [Figure 7], maximum death rates were reported in patients with both acute SDH and contusions (73.6%); followed by acute SDH alone (47.5%) and contusions alone (37%).

Table 3: Analysis of Mortality

PARAMETER WITH NO. OF PATIENTS	NO. OF PATIENTS SURVIVED WITH PERCENTAGE	NO. OF PATIENTS EXPIRED WITH PERCENTAGE
Age < 30 years(42)	19(45.2%)	23(54.8%)
Age > 30 years(158)	69(43.7%)	89 (56.3%)
Two-wheeler RTA(122)	44(36.1%)	78(63.9%)
Self fall(27)	19(70.4%)	8 (29.6%)
Assault(8)	3(37.5%)	5(62.5%)
Co-morbidities(72)	19(26.4%)	53(73.6%)
DM only(19)	1(5.3%)	18(94.7%)
HTN only (41)	15(36.6%)	26(63.4%)
DM+HTN(8)	0	8(100%)
Alcoholism(95)	40 (42.1%)	55(57.9%)

Figure 4: Survival and Mortality Age-wise

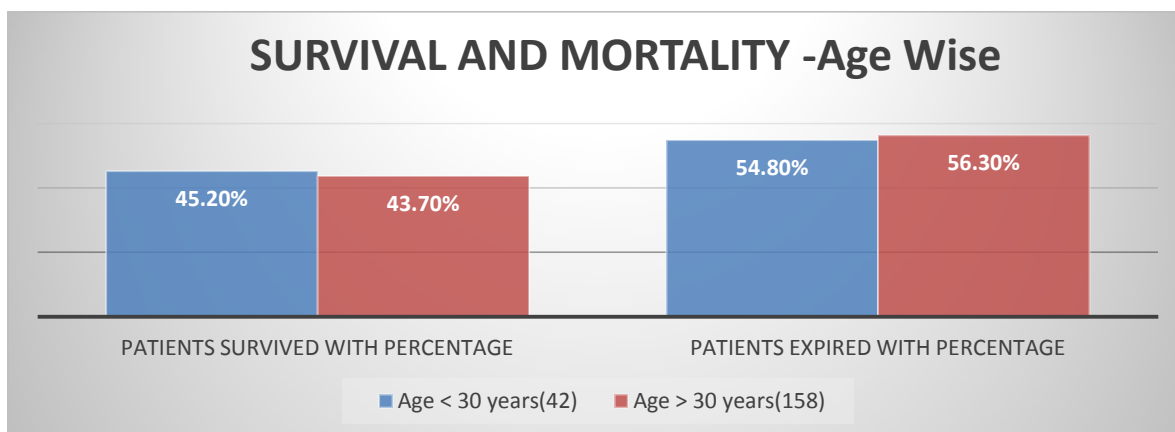


Figure 5: Survival and Mortality-Comorbidities

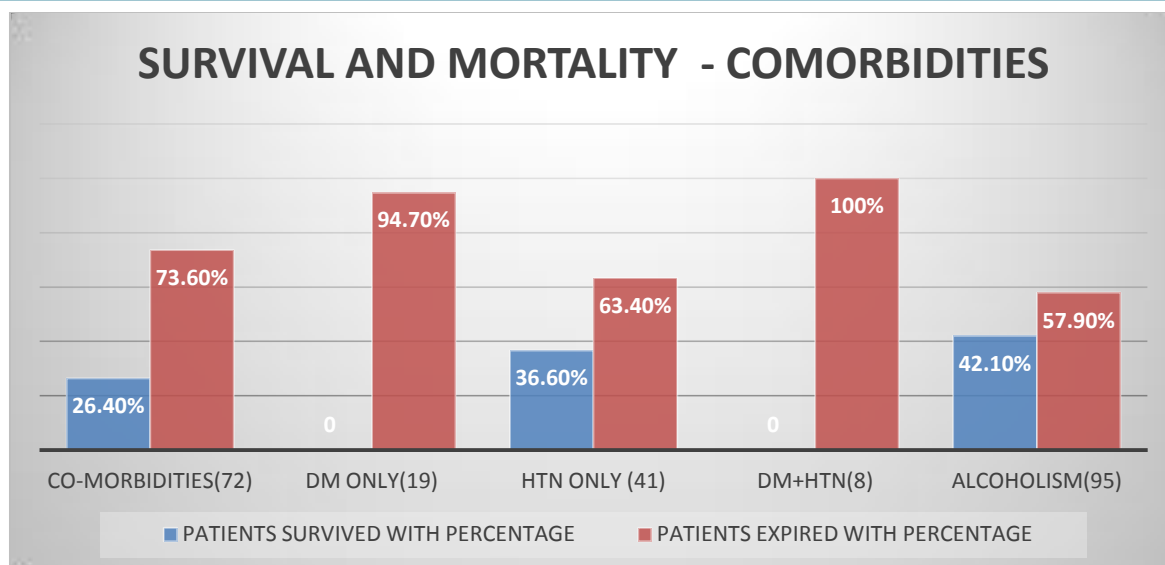


Figure 6: Survival & Mortality-Modes of Injury

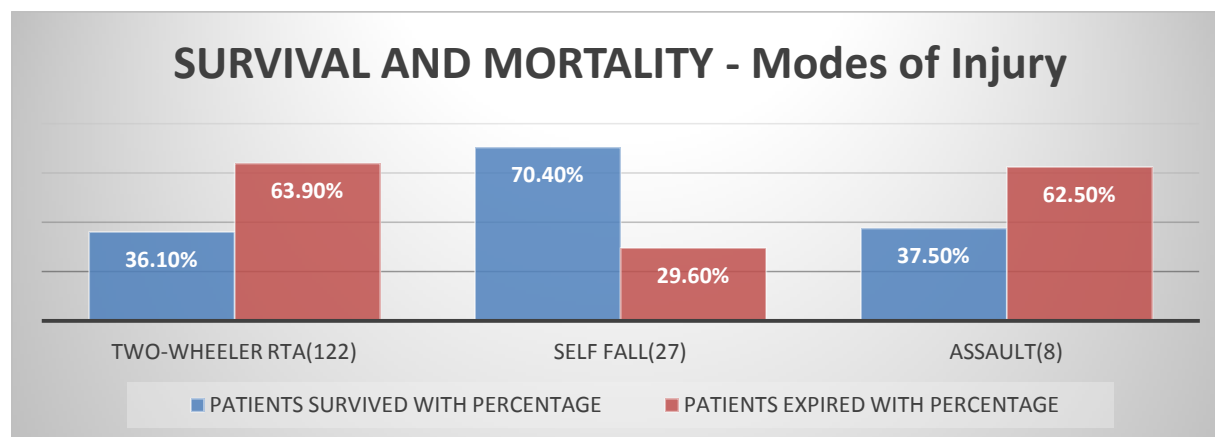
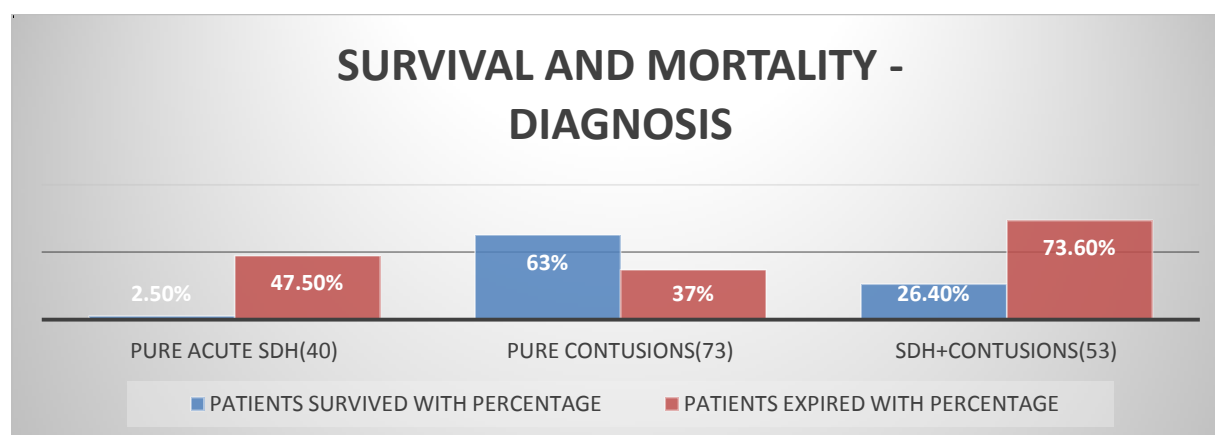


Figure 7: Survival & Mortality-Diagnosis



DISCUSSION

The most commonly affected group with TBI in our area was between 20-50 years of age because they are

the most active of all. This correlated with the study of Bagheri et al³. Males were more commonly affected than females; male to female ratio was 4.1:1. This was similar to the study of Timofeev et al⁴ where the male female ratio was 3:1. Two-wheeler RTA was the most common mode of injury in this region. Alcoholism was one of the main factors (47.5%) associated with TBI. HTN and DM were the

CONCLUSION

Many important conclusions can be drawn from our study. Regionally, East Godavari is a semi-urban area with a large proportion of rural population as well, so public transport is not routinely available. So two-wheelers are the main modes of transport and hence the most common mode of injury also. Also alcoholism is rampant in this part of the country so it is frequently associated with TBI. Co-morbidities like DM, HTN; older age and poor GCS at admission have an adverse impact on the survival and surgical outcome of TBIs.

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