

## Head Injury in old Age- An Institutional Experience

\*Dr. B. Chandra shekar<sup>1</sup>, Dr. Rohit Reddy Arumalla<sup>2</sup>, Dr. I BabjiSyam Kumar<sup>3</sup>,

Dr. Kesanakurthi Satyanarayana Murthy<sup>4</sup>.

<sup>1</sup>Assistant Professor, <sup>2</sup>Post Graduate, <sup>3</sup>Assistant Professor, <sup>4</sup>Professor, Department Of Neurosurgery, Guntur Medical College, Guntur, Andhra Pradesh, India.

Corresponding Author: \*Dr. B. Chandra shekar

### Abstract

**Introduction:** Head injuries are common in all age groups, the incidence of head injuries in old age groups have shooted up in recent past throughout globally, the reason behind this is, increased life expectancy and thereby adapting to more active life style in older age groups, the aim of this study is to identify the better method of approaching in such patients who sustain head injuries and thereby help in reducing mortality, morbidity and disability in this group of patients.

**Objective:** The aim of this study is to identify the treatment approach in old age groups who sustain head injuries to minimize morbidity and mortality.

**Material and Methods:** This is a prospective study which includes all the patients with age above 60 years who are admitted to department of neurosurgery, Guntur medical college and hospital, Guntur, following head injury for a period of 1 year from January 2016 to February 2017.

**Results:** 536 patients are included in this study in a period of 1 year, from January 2016 to February 2017, patients were categorized according to their 1. sex, 2. age group, 3. mode of injury, 4. Presenting GCS, 5. Time of presentation to the hospital (within 24 hours or after 24 hours), 6. Computerized tomography done at the time of admission or not, 7. Associated comorbidities, 8. Surgical or non-surgical management, 9. Morbidity, and 10. Mortality.

**Conclusion:** Head injuries leading to morbidity and mortality in old age groups can be reduced if the provision of treatment is early and approach is multi departmental, it is further more beneficial to the patient as well as the family if geriatric care units can be established in as many centers as possible.

**Keywords:** Head injuries, Old age, Morbidity, Mortality, Geriatric care units.

Date of Submission: 26 -10-2017

Date of acceptance: 04-11-2017

### I. Introduction

Indian population life expectancy is being improved with every year adding up to its age, this is because of drastic improvements in public health and medical advances in prevention of many diseases thereby resulting in growth of old age population, the size of old aged population has risen from 12.1 million (5%) in 1901 to 77 million (7.4%) in 2001<sup>1</sup>. National commission on population in 2011 quoted the total senior citizen population of India is 8.3%.<sup>2</sup> The United Nations Population Fund and Help Age International reported that the old aged population will shoot up to 360%, that is up to 323 million, constituting 20% of total population by 2050<sup>2</sup>. The growth of old aged population in India is actually a good sign in progress of countries health care system, however provision of such health facilities can be challenging sometimes, especially for old aged people who have had head injuries, as this becomes emotional, physical and economical burden to both patient and patient's family. Head injuries are one of the leading cause of disability in India<sup>3</sup>. With increasing age there is decrease in physiological reserve, metabolic activity and hormonal response of the patient which are risk factors in outcome after head injury<sup>4,5</sup>. The goal of this study is to establish the pattern of head injuries in old aged population and their outcome in a tertiary referral hospital.

### II. Aims And Objectives

1. To identify and establish the pattern of head injuries in old aged population being admitted and treated in this tertiary hospital.
2. To plan and design a treatment strategy for such patients in this tertiary hospital thereby reducing morbidity and mortality.

### III. Material And Methods

This is a prospective study comprising of 536 patients, aged 60 years or above, who sustained head injuries and are admitted in Department of Neurosurgery, Guntur medical college and hospital, Guntur, Andhra Pradesh, India for a period of 1 year( January 2016- February 2017). The data collected is analyzed and reviewed with other similar studies to identify the pattern of head injuries in old aged population and strategize the treatment approach in such patients for this tertiary hospital.

### IV. Inclusion And Exclusion Criteria

**Inclusion criteria:** 1. All the patients aged 60 years or above who sustained head injury, 2. Patient, whose attenders have consented for the study, 3. Patients whose pathology is established in CT Brain or MRI brain.

**Exclusion criteria:**1. Patients who are brought dead to the hospital, 2. Patients whose pathology cannot be established in CT Brain or MRI brain even after 48 hours after the injury, 3. Patients from whom the consent is not obtained, 4. Comatosepatients for whom surgical intervention was required but patient attenders were not willing to provide consent for surgical intervention.

### V. Observation And Results

**Age:** Number of patients aged 60 years or above who sustained head injury in a period of 1 year were 536, patients in age group between 60 to 69 years were 347(64.73%), 70 to 79 years were 102(19.02%), 80 to 89 years were 63 patients (11.75%), 90 years and above were 24 (4.47%) patients.

s.no.	Age in years	No. of patients (n)	Percentage (%)
1.	60-69 years	347	64.73%
2.	70-79 years	102	19.02%
3.	80-89 years	63	11.75%
4.	90 years and above	24	4.47%
5.	<b>Total</b>	<b>536</b>	<b>100%</b>

**Sex:** Out of 536 patients 393(73.32%) were male patients and female patients were 143 (26.67%). Male patients between 60-69 years were 238, 70-79 years were 92, 80-89 years were 49 and 90 years and above were 14. Female patients between 60-69 years were 109, 70-79 years were 10, 80-89 years were 14 and 90 years and above were 10.

s.no.	sex	No. of patients (n)	Percentage (%)
1	Male	393	73.32%
2.	Female	143	26.67%
3.	<b>Total</b>	<b>536</b>	<b>100%</b>

**Mode Of Injury:** Patients who sustained head injury due to: Fall were 186(34.70%), Motor vehicle accidents including railway accidents were 294 (54.85%), Burns were 9(1.67%), Assault were 43(8.02%), and due to unknown cause were 4(0.74%).

s. no.	Mode of injury	No. of patients	percentage
1.	Fall	186	34.70%
2.	Motor vehicle accidents including railway accidents	294	54.85%
3.	Burns	9	1.67%
4.	Assault	43	8.02%
5.	Unknown cause	4	0.74%
6.	<b>Total</b>	<b>536</b>	<b>100%</b>

**Polytrauma:** Out of 536 patients, 198(36.94%) patients had polytrauma, and amongst them 32(5.97%) were due to fall, 154(28.73%) were due to motor vehicle accidents including railway accidents, 9(1.67%) were due to burns, 2(0.37%) were due to assault, and 1(0.18%) due to unknown cause.

**Alcohol Influence:** Patientswho sustained head injury after alcohol consumption were 139 (25.93%), out of these 139 patient's males were 136 females were 3.

s. no.	Patients under alcohol influence	No. of patients	percentage
1.	Male	136	97.84%
2.	Female	3	2.15%

**Time Of Presentation:** out of 536 patients 224(41.79%) presented to the hospital within 24 hours after the injury and out of this 224 patients males were 159 and females were 65 and 312 (58.20%) patients presented after 24 hours and out of these 312 patients 234 were males and 78 were females.

s. no.	Time of presentation	No. of patients	percentage
1.	< 24 hours	224	41.79%
2.	> 24 hours	312	58.20%

**Gcs:** Out 536 patients 261(48.69%) patients presented with mild traumatic brain injury (GCS 13- 15), 100 (18.65%) patients presented with moderate traumatic brain injury (GCS 8-12), 142( 26.49%) patients presented with severe traumatic brain injury( GCS 3-8) and 33 (6.15%) patients were under alcohol influence at the time of presentation.

s. no.	GCS	No. of patients	percentage
1.	13-15	261	48.69%
2.	8-12	100	18.65%
3.	3-8	142	26.49%
4.	Patients under alcohol influence at the time of presentation	33	6.15%
5.	<b>Total</b>	<b>536</b>	<b>100%</b>

**Time Of Imaging To Rule Out Brain Injury:** CT brain was done in 439 patients immediately after presenting to the hospital, it was delayed in 97 patients as they were referred to neurosurgery unit from other departments following deterioration of the patient.

s. no.	Time of imaging	No. of patients	percentage
1.	Immediately	439	81.90%
2.	Delayed	97	18.09%
3.	<b>Total</b>	<b>536</b>	<b>100%</b>

**Treatment:** out of 536 patients, 145(27.05%) patients were intervened surgically and 391(72.94%) patients were treated conservatively.

s.no.	Intervention	No. of patients	percentage
1.	Surgical	145	27.05%
2.	Conservative	391	72.94%
3.	<b>Total</b>	<b>536</b>	<b>100%</b>

**Mortality:** Out of 536 patients, 230 patients succumbed, amongst the age group 60-69 years the mortality was 129 patients (37.17%), amongst 70-79 years age group mortality was 42 patients(41.17%), amongst 80-89 years age group- 39 patients expired (61.90%), and patients with age 90 years and above 20 patients(83.33%) expired. 78 patients (53.79%) out of 145 surgically intervened patients expired and 152 patients (38.87%) out of 391 who were treated conservatively expired.

s.no.	Mortality amongst age groups	No. of patients	percentage
1.	60-69 years	129	37.17%
2.	70-79 years	42	41.17%
3.	80-89 years	39	61.90%
4.	90 years and above	20	83.33%
5.	<b>Total</b>	<b>230 (out of 536)</b>	<b>42.91%</b>

s.no.	Mortality	No. of patients expired	percentage
1.	Surgically intervened group	78 /( <b>145</b> )	53.79%
2.	Conservatively treated group	152/ ( <b>391</b> )	38.87%

**Morbidity:** Amongst the 4 age groups, patients who survived but lost the ability to perform their daily activities were: 60-69 years- 119 patients (54.58%), 70-79 years- 43 patients (71.66%), 80-89 years-22 patients (91.66%), 90 years and above- 4 patients (100%).

s.no.	Patients who survived but lost ability to perform their daily activities	No. of patients	percentage
1.	60-69 years	119	54.58%
2.	70-79 years	43	71.66%
3.	80-89 years	22	91.66%
4.	90 years and above	4	100%

## **VI. Discussion**

According to the World Health Organization, traumatic brain injury (TBI) will lead as the major cause of death and disability by the year 2020. It is estimated that 10 million people are affected annually by TBI<sup>6</sup>, Peschman et al. concluded in their study that, age alone is associated with increased odds of being admitted to the hospital after head injury<sup>7</sup>. Old aged patients suffering from head injury were thought to have poor outcome. They were more likely to go to rehabilitation or long-term care facilities, or expired compared to young and middle-aged patients<sup>8</sup>, Elderly TBI patients also bear higher cost during hospital stay in cost-analysis models<sup>9</sup>. In the present study, patients of age 60 years and above with head injuries were considered and accounted in total of 536 patients, out of which 73.32% are males and 26.67% are females, compared to 71% males and 29% females in Ashok Munivenkatappa et al. study<sup>10</sup>. In the present study, head injuries accounted to falls are 34.70%, motor vehicle accidents including railway accidents are 54.85%, burns accounted to 1.67%, assault is the cause in 8.02% patients and cause was not found in 0.74% of patients, whereas in Ashok Munivenkatappa et al. study falls accounted for 53%, motor vehicle accidents and railway accidents accounted for 32.5%, Burns accounted for 4.5%, assault accounted for 3.5% pedestrian and others accounted for 6.5%<sup>10</sup>.

In the present study, a total of 25.93% were found to have consumed alcohol, leading to the incident. Out of which 97.84% were males and 2.15% were females. In the present study, 41.79% patients presented within 24 hours of injury and 58.20% of patients presented after 24 hours of injury, there are no other studies to compare the patients time of presentation and the correlation of it in establishing the importance of presentation time, in management and outcome of the patient. In the present study, according to Glasgow coma scale, 48.69% patients had mild traumatic brain injury (TBI), 18.65% patients had moderate TBI, 26.49% had severe TBI, and in 6.15% GCS could not be evaluated as they were under alcohol influence at the time of presentation, compared to Ashok Munivenkatappa et al. study, 56% had mild TBI, 16% had moderate TBI and 28% had severe TBI<sup>10</sup>.

In the present study, CT imaging is done immediately in 81.90% of patients after presenting to the hospital, and it was delayed in 18.09% of the patients, as they were initially admitted in other departments for other than head injuries and deteriorated in GCS and later were referred to neurosurgery unit. Moderate cerebral atrophy may be present in some older adults, which can cause occult findings to be present on head computed tomography (CT) despite an initial intact neurological examination<sup>11</sup>. In the present study, 27.05% patients are treated surgically by evacuating intracranial bleed and 72.94% patients were treated conservatively, which were observed to be almost similar to the other study done from India by Ashok Munivenkatappa et al<sup>10</sup>, where 27% of patients were treated surgically and 73% of patients were treated conservatively. In the present study, mortality is 42.91%, which is high compared to Ashok Munivenkatappa et al study, where it is 36%. In the present study, amongst the age groups the mortality is as follows: patients among 60-69 years had 37.17%, among 70-79 years age group mortality was 41.17%, among 80-89 years age group mortality was 61.90% and among patients with age 90 years and above the mortality was 83.33%, showing progressively increasing mortality with age of the patients. Cerebrovascular atherosclerosis and decreased free radical clearance are behind the physiological causes for poor outcome of older age patients<sup>11</sup>. Also in this study, mortality was high in surgically treated group of patients i.e. 53.79% compared to conservatively treated group, where mortality was 38.87%. In the present study, among the four age groups taken into consideration, patients who survived but lost ability to perform their daily activities by themselves in the followup period are as follows: 54.58% among 60-69 years age group, 71.66% among 70-79 years age group, 91.66% among 80-89 years age group and 100% among patients with age 90 years and above.

## **VII. Conclusion**

The present study implicates that there is progressive increase in morbidity and mortality with increasing age in patients with head injuries above 60 years, there is a need for many more demographic analysis data required on head injuries in elderly people in India. The present study is pointing to a specific pattern of head injuries in this developing nation. There is increase in head injuries in elderly people with time progress due to advancement in transportation like development of roads and increase in high speed vehicles, as road traffic accidents were the leading cause of head injuries not only elderly people but also in their counterpart younger people, so the development of transportation should also match the safety measures in avoiding such road traffic accidents. This study also pointed out that about one fourth of the patients in this study included have consumed alcohol prior to the injury, which is a significant percentage. A separate geriatric unit in a tertiary referral hospital with set protocols to manage trauma cases will help avoid in delayed diagnosis of head injuries in old age people and there by reducing morbidity and mortality. This study noted that, there is increase in morbidity with age progress in elderly patients with head injuries, thereby increase in hospital stay and proportionately increase in cost of management, governments should consider a separate health policy or insurance in accommodating such cost in management of elderly patients with head injuries.

### References

- [1]. Central S. Office. Situation Analysis of the Elderly in India. Available at: [http://www.mospi.nic.in/mospi\\_new/upload/elderly\\_in\\_india.pdf](http://www.mospi.nic.in/mospi_new/upload/elderly_in_india.pdf). Accessed July 21, 2016
- [2]. India's Elderly Population. Some Fundamentals. March 8, 2013. General Knowledge Today. <http://www.gktoday.in/indias-elderly-population-some-fundamentals/>. Accessed July 21, 2016
- [3]. Das A, Botticello AL, Wylie GR, Radhakrishnan K. Neurologic disability: a hidden epidemic for India. *Neurology* 2012;79(21):2146-2147
- [4]. Broos PL, D'Hoore A, Vanderschot P, Rommens PM, Stapperts KH. Multiple trauma in elderly patients. Factors influencing outcome: importance of aggressive care. *Injury* 1993;24(06):365-368
- [5]. Morris JA Jr, MacKenzie EJ, Damiano AM, Bass SM. Mortality in trauma patients: the interaction between host factors and severity. *J Trauma* 1990;30(12):1476-1482
- [6]. Hyder AA, Wunderlich CA, Puvanachandra P, et al. The impact of traumatic brain injuries: a global perspective. *NeuroRehabilitation*. 2007;22(5):341-53
- [7]. Peschman J, Neideen T, Brasel K. The impact of discharging minimally injured trauma patient: does age play a role in trauma admission? *J Trauma*. 2011;70(6):1331-6
- [8]. LeBlanc J, de Guise E, Gosselin N, et al. Comparison of functional outcome following acute care in young, middle-aged and elderly patients with traumatic brain injury. *Brain Inj*. 2006;20(8):779-90
- [9]. Chan LY, Moran JL, Clarke C, et al. Mortality and cost outcomes of elderly trauma patients admitted to intensive care and the general wards of an Australian tertiary referral hospital. *Anaesth Intensive Care*. 2009;37(5):773-83.
- [10]. Ashok Munivenkatappa et al. Neurotrauma in Old Aged: A Study from India *Indian Journal of Neurosurgery* Vol. 6 No. 1/2017;4-9
- [11]. Timiras, P. The nervous system: Structural and biochemical changes.. In: Timiras, P., editor. *Physiological Basis of Aging and Geriatrics*. 3rd Ed.. CRC Press; Boca Raton, FL: 2003. p. 99-118.

\*Dr. B. Chandra shekar. "Head Injury in old Age- An Institutional Experience." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 16.11 (2017): 04-08