IJBPAS, March, 2022, 11(3): 1407-1415

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

ASSESSMENT OF CONSERVATIVE VERSUS SURGICAL TREATMENT IN HEAD INJURIES BY USING GLASGOW COMA SCALE (GCS)

VAIDYULA S[1*], NAGULA S[1], MADURI S[1], RAVEENDRA BK[2] AND C ESWARAIAH M[3]

1: Department of Pharmacy, Anurag Pharmacy College, Ananthagiri (V), Kodad (M), Suryapet (Dist), Telangana-508206, India

2: Assistant Professor, Department of Pharmacy, Anurag Pharmacy College, Ananthagiri (V), Kodad (M), Suryapet (Dist), Telangana-508206, India

3: Principal, Department of Pharmacology, Anurag Pharmacy College, Ananthagiri (V), Kodad (M), Suryapet (Dist), Telangana-508206, India

***Corresponding Author: Srivalli Vaidyula: E Mail:** srivallivaidyula1234@gmail.com

Received 18th April 2021; Revised 19th May 2021; Accepted 25th June 2021; Available online 1st March 2022

https://doi.org/10.31032/IJBPAS/2022/11.3.5966

ABSTRACT

Back ground: To assess the conservative versus surgical treatment in head injuries by using GCS scale to increase the rate of quality of life of people in both conservative and surgical treatment **Aim:** Assessment of conservative versus surgical treatment. **Method:** A prospective observational study was done in neurosurgery department of tertiary care hospitals. All the subjects who met with a head injury was included in the study, All the patients were divided into 2 groups based on their severity of the condition, among them some of them were treated with conservative management and some of them treated with surgical treatment, GCS score were assessed and treatments can be compared. **Results:** Patients with age groups (13-70) were calculated and the various type of injuries were recorded, severity of the conditions of the patient's mild (33.2%), moderate (38.8%), severe (28%) were observed based upon the GSC Scale. **Conclusion:** Modern researchers may not have significantly improved the assessment of both conservative vs surgical treatment in head injuries ,there is a lack of convincing evidence for approaching the exact therapy, so here in this study there is a perfect evidence for the therapy by assessing the severity of the condition by using GCS scale and there is a significant difference between the type of injury and age related to the type of treatment with (p=0.002108239) and (p=0.002634942) respectively.

Majority of the injuries observed were RTA (36%) and falls (18.4%). In case of conservative treatment there is a chances for reducing secondary brain insult, most of the cases observed were preferred conservative treatment and the patients with score <8 were preferred surgical treatment (decompressive craniectomy). In severe conditions in any type of TBI.

Keywords: Conservative, Road Traffic Accidents (RTA), Surgical treatment, Traumatic brain injury (TBI)

INTRODUCTION

Injuries are defined as a physical damage to a person caused by an acute transfer of either Mechanical, thermal, electrical energy or by lack of supply of oxygen **[1]**. In some cases, injuries are categorized into unintentional and intentional causes **[2]**. Burden of injury, In 2010 there were millions of deaths due to injuries more than deaths due HIV, malaria, and tuberculosis combined **[3]**, It was the second leading cause for death and disability **[4]**. After traumatic injury adequate and patient oriented treatment is necessary **[5]**, As the primary insult the direct mechanical damage, cannot be therapeutically influenced **[6]**, the target of the treatment will be limited influenced by the secondary damage**.**

Neurological assessment: Glass gow coma scale

Glass gow coma scale is the most widely used method for recording the levels of consciousness in patients at presentation and subsequent assessment **[7]**. In case of severity condition of the patient it is considered as- mild (13 -15), moderate (9-12), severe (3-8)

Pre-hospital management **Management of airway/oxygenation:**

Prevention, identification and treatment of hypoxia (O_2 saturation < 90% and/or cyanosis). Continuous high-flow O2 to all the potential TBI case Target of $ETCO_2$ level 40mmHg, with careful attempts maintain between 35mmHg to 45mmHg, try to maintain ventilation rates as: infants-25 beats/min, Children-20beats/min, Adolescence /adults-10beats/min.

Management of Blood pressure: Hypotension, in most of the cases SBP≤90mmHg is considered as hypotension mainly in adults, children, adolescence and elder, in case of pediatrics it is considered as fifth percentile of age, it is estimated by using formula [70mmHg + (age x 2)]. **[8]**.

Sedation and Analgesic: Prophylaxis against intracranial hypertension by administration of barbiturates to induce burst suppression is not recommended **[9]**.

IP Monitoring and management: Management for severe TBI patients depend upon ICP. Monitoring may decrease in hospital and two-weeks post

injury mortality **[10]**. The recommended treatment of ICP >22mmHg to reduce mortality. The newer technique invasive monitoring uses the EVD (Extra Ventricular Drain) by using catheter.

Osmotherapy: Mannitol has been used since 1960s as the major treatment for elevated ICP **[11]** and it is considered as a component of TBI Management guidelines.

Anticonvulsant therapy: To prevent the secondary brain injury many attempts have been studied for the benefits of prophylaxis for seizures with phenytoin as effective in decreasing the rate of post traumatic seizures in the first 7 days of injury**.** Clinical outcomes and comparision of Levetiracetam and phenytoin in prevention of earlier post traumatic seizures **[12]**.

Decompressive craniectomy: It is a surgical procedure; hence it involves removal of a large section of skull. Craniectomy reduces the ICP by giving extra space to swollen brain and that leads to quickly prevention of brain stem herniation. DECRA trial includes the patient who was having refractory raised ICP between 15min to 1 hour of onset **[13]**.

Antibiotic therapy: TBI patients more likely to receive mechanical ventilation. There is also mostly to be increased risk for chances of developing infections, then the potential infection to be identified and appropriate therapy should be recommended. It is evaluated that patient who have received bacitracin flushes shows higher rate of infection among intervention group.

OBJECTIVES: To assess the conservative vs surgical treatment.

- Diagnosing the condition of the patient by using GCS score.
- Estimating the stages of the patients by glass gow coma scale.
- To evaluate the prescribed pattern of drugs for the conservative as well as surgical treatment.
- To evaluate the possible outcomes in patients after PTBI.
- To improve the life expectancy of the patient.

MEHODOLOGY

Study design: Prospective observational study was conducted on assessment of conservative vs surgical treatment in head injuries by using GCS score. Study **site:** study was conducted in various hospital in Telangana region **Sample size:** 200 -300 samples **Data collection:** patient's medical records at ICU, neurology department, the medical records were reviewed on daily basis, the data will be collected in specially designed data collection form. **Inclusion criteria:** All the patients who met with head injury, Patients with any of the gender, Patients above 10 years, Patients who are already diagnosed also included in the study. **Exclusion criteria:** Patients who

are not willing to participate in the study, Patients with below 10 years of age and Patient treated in outpatient department, Patients above 80 years of age, Patients who left on LAMA **Duration of the study:** Study was conducted for a period of 6 months. **Statistical Analysis:** Statistical analysis will be conducted on the basis of descriptive analysis to furnish the data and the appropriate tables and charts should be used by excel. **Sources of the data:** Patient history interview, Inpatient profile interview, Diagnostic criteria, patient treatment charts.

RESULTS

A total number of 250 patients were enrolled in the study, All the patients who are included in the study were diagnosed by different types of head injury and the severity of the conditions also be observed in the patients with various stages can be considered by using GCS scale.

Gender wise distribution: Out of 250 patients, 161 males with (64.40%) and 89 females with (35.6%) were met with different types of injuries, males are more prone to injuries than females **(Table 1)**.

Age categorization:

Among the involved patients, according to age distribution 13-20years (19 patients) were involved (7.6%), 21-30 years (79 patients were involved (31.6%), 31-40 years (73 patients) were involved (29.2%), 41-50yrs (43 patients) were involved (17.2%), 51-60yrs (23 patients) were involved (9.2%), 60-70 years (13 patients) were involved (5.2%) was shown in the table. 2, mostly the age between 21-30 years was effected with head injuries, there is a significance difference ($P = 0.002634942$) i.e., $P<0.05$ between the both the treatments that is conservative as well as surgical treatment with the age categorization **(Table 2)**.

Distribution according to type of injury: Patients with various types of head injuries are involved in this study, mainly RTA - 90 patients (36%), sports -27 patients (10.80%), home accidents-14 patients (5.6%), interpersonal voilence-21 patients (8.4%), unintentional injuries -10 patients (4%), physical assault - 11 patients (4.4%), self-harm -11 patients (4.4%), febrile seizures -8 patients (3.2%), falls -32 patients (12.8%), drowning - 26 patients (10.4%), therefore **Table 3** shows that patients who met with RTA were more in number than any other, there is a significant difference ($p=0.007108239$) i.e., p value <0.05, observed between the type of injury and the both treatments conservative as well as surgical treatment **(Table 3)**.

Distribution based upon GCS Scale: Among of all 250 patients, according to the severity of the condition they can be distributed 83 patients (33.2%) showed mild (13-15), 97 patients (38.80%) showed

moderate (9-12) and finally 70 patients (28%) showed severe (3-8) **(Table 4)**.

Categorization according to type of treatment: In the total of 250 patients, 168 members treated with conservative treatment and surgical treatment in 82 patients, however more number of patients mostly preferred conservative treatment in some circumstances of the injury **(Table 5)**.

Categorization of diagnosis:

Patients with ACF repair-20 patients shows (8%), cerebral contusion-46 patients show (18.4%), cerebral hemorrhage -10 patients show (4%), FLC - 63 patients show (25.2%), head injury -25 patients show (10%), PLC -16 patients show (6.40%), skull fracture - 1 patient shows (0.40%), TBI -69 patients show (27.6%) **(Table 6)**.

Categorization of drugs:

Most widely used class of drugs in head injuries includes analgesics (18.1818%), anti convulsants (15.94%), antidepressants (7.318%), antibiotics (14.09%), benzo-diazepine's (7.935), anti-psychotics (7.704%), barbiturates (5.701%), vitamins supplements (11.016%), osmotic diuretic (9.399%), hematinic (2.696%) **(Table 7)**.

Table 1: gender wise distribution of head injury patients

Gender	No .of pts	Percentages
Males	161	64.40%
Females	89	35.60%
Total	250	100%

Table 2: Age wise distribution of patients with head injuries

Age	No. of pts	Percentages	Conservative	Surgical
13-20	19	7.6	15	4
21-30	79	31.6	53	26
31-40	73	29.2	46	27
41-50	43	17.2	26	17
51-60	23	9.2	18	5
61-70	13	5.2	10	3
Total	250	100	168	82

Table 3: Distribution of patients according to type of injuries

Type of injury	No .of patients	Percentages	Conservative	Surgery
Road traffic accident	90	36%	44	46
Sports	27	10.80%	24	2
home accidents	14	5.60%	12	2
interpersonal violence	21	8.40%	22	5
Unintentional	10	4%	9	1
physical assault	11	4.40%	26	6
self-harm	11	4.40%	3	8
febrile seizures	8	3.20%	8	3
Falls	32	12.80%	12	9
drowning	26	10.40%	8	0
Total	250	100	168	82

Table 4: Based upon severity of the injury

GCS scale	No. of Patient	Percentages
Mild	83	33.20%
Moderate	97	38.80%
Severe	70	28%
Total	250	100

Table 5: Categorization of patients according to their treatment

Type of treatment	No. of Patients
Conservative	168
Surgical	82
Total	250

Table 6: Distribution of patients according to categorization of diagnosis

Diagnosis	No. of patients	Percentages
ACF repair	20	8%
Cerebral Contusion	46	18.40%
Cerebral Hemorrhage	10	4%
FLC	63	25.20%
Head Injury	25	10%
PLC	16	6.40%
Skull fracture	1	0.40%
TBI	69	27.60%
Total	250	100

Table 7: Drugs categorization

Drugs Category	No. of patients	Percentage
Analgesics	236	18.1818
Anti convulsants	207	15.94
Anti-depressants	95	7.318
Antibiotic	183	14.09
Benzodiazepines	103	7.935
Anti-psychotic	100	7.704
barbiturates	74	5.701
vitamins	143	11.016
osmotic diuretics	122	9.399
Hematinic	35	2.696

DISCUSSION

In accordance with the patient's suitability majority of the patients were treated with conservative treatment in mild and moderate condition and surgical treatment in severe conditions.

Currently, the mode of injury on observing the GCS score for the younger and the elder patients with moderate and mild anatomic severity shows unknown better results rather than in case of severe conditions it may shows spectacular events in elders, probably there is a significant difference (p=0.002634942) between the age group and the type of treatment. In previous studies Sanisha Sunny *et al*., and Zafonte *et al*., also reported the younger and the elder age patients were showing more prevalence of TBI **[14] [15]**, according to their age groups treatment was recorded based upon the scores.

Among the 250 patients, 161 patients (64.4%) were males and 89 patients (35.6%) were females, In the recent studies the subjects enrolled in the study were 68% of males and 32% of females **[14]**, here we observed that males are more prone to head injuries than females because males engage in more behavioral exposal changes and having high risk of injuries.

Some of the other findings like patients with traumatic brain injury and falls were majorly observed in our study, TBI due to the road accidents and mainly

falls due to irreversible health, social and psychological consequences. Neha. S. Jadhav *et al*., 2018, reported that in total 185 patient's majority of them were prone to RTA. 152 patients with (82.16%), Assaults and falls 33 patients with (17.84%) were recorded, in our study RTA and falls are the majority of the patients prone to these injuries, and there is a significant difference (p=0.007108239) between the type of the injuries and both the treatments and there is no perfect correlation between the type of the injury and treatment that performed either conservative are the surgical treatment.

The management of head injury includes mainly includes firstly airway ventilation and other findings that analgesics was most frequently prescribed Neha. S. Jadhav *et al*., 2018, reported in this study that mostly 75 patients out of 185 were treated with Sedatives and antiepileptic's **[16]**. In this study it was found that the most of the analgesics along with Anticonvulsants were prescribed for the patients with conservative as surgery.

CONCLUSSION

Modern researchers may not have significantly improved the assessment of both conservative vs surgical treatment in head injuries, there is a lack of convincing evidence for approaching the exact therapy, so here in this study there is a perfect evidence for the therapy by assessing the severity of the condition by using GCS scale and there is a significant difference between the type of injury and age related to the type of treatment. In case of conservative treatment there is a chances for reducing secondary brain insult, most of the cases observed were preferred conservative treatment and the patients with score <8 were preferred surgical treatment (decompressive craniectomy), in this study mainly we observed the TBI and falls in any age of the people mainly the of 20-40 years were mostly effected, there by TBI mostly seen in young male population and most of these are preventable. Mortality increases with the severity of the condition, by improving our system for better reporting and documentation of the cases, finally when conservative and surgical treatment is considered there is a mandatory observation of the neurological assessments.

ACKNOWLEDGEMENT

We would like to thank to my parents and to Dr. M. Chinna Eswaraiah, Principal of Anurag Pharmacy College for granting us necessary permissions for the study. The authors also thank all the faculty members of Anurag Pharmacy College for their constant support and their guidance.

Ethical Approval

Ethical approval was obtained from the Ethical committee of Anurag Pharmacy College.

REFERENCES

[1] Krug E, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, eds. World report on violence and health. Geneva: World Health Organization; 2002.

[2] Cause specific mortality: regional estimates for 2008. Geneva: World Health Organization. (http://www.who.int/healthinfo/global_burden_disease/estimates_regional/en/index.html).

[3] Rivara FP, Grossman DC, CummingsP. Injury prevention. N Engl J Med 1997; 337: 543-8.

[4] Seedat M, Van Niekerk A, Jewkes R, Suffla S, Ratele K. Violence and injuries in South Africa: prioritizing an agenda for prevention. Lancet 2009; 374: 1011-22. [Erratum, Lancet, 2009; 374: 978].

[5] Baethmann A, Eriskat J, Stoffel M, Chapuis D, Wirth A, Plesnila N. Special aspects of severe head injury: recent developments. Curr. Opin. Anaesthesiol., 1998; 11: 193-200.

[6] Marshall LF. Head injury: recent past, present, and future. Neurosurgery, 2000; 47: 546-61.

[7] Lin K, Dulebohn SC. Ranchos Los Amigos. Treasure Island (FL), Stat Pearls Publishing. 2017.

[8] Contant CF, Valadka AB, Gopinath SP, Hannay HJ, Robertson CS. Adult respiratory distress syndrome: a complication of induced hypertension after severe head injury. J Neurosurg., 2001; 95: 560-8.

[9] Chou A, Krukowski K, Jopson T, Zhu PJ, Costa-Mattioli M, Walter P, *et al*. Inhibition of the integrated stress response reverses cognitive deficits after traumatic brain injury. Proc Natl AcadSci U S A 2017; 114: E6420-6.

[10] Balestreri M, Czosnyka M, Hutchinson P, Steiner LA, Hiler M, Smielewski P, *et al*. Impact of intracranial pressure and cerebral perfusion pressure on severe disability and mortality after head injury. Neurocrit Care 2006; 4: 8-13.

[11] Cottenceau V, Masson F, Mahamid E, Petit L, Shik V, Sztark F, *et al*. Comparison of effects of equiosmolar doses of mannitol and hypertonic saline on cerebral blood flow and metabolism in traumatic brain injury. J Neurotrauma 2011; 28: 2003-12.

[12] Yang Y, Zheng F, Xu X, Wang X. Levetiracetam versus phenytoin for seizure prophylaxis following traumatic brain injury: a systematic review and meta-analysis. CNS Drugs 2016; 30: 677-88.

[13] Hutchinson PJ, Kolias AG, Timofeev IS, Corteen EA, Czosnyka M, Timothy J. Trial of decompressive craniectomy for traumatic intracranial hypertension. N Engl J Med 2016; 375: 1119-30.

[14] Sanisha Sunny, Priyanka Vajjapally, Sheshagiri Sharavana Bhava Bandaru, Venkateshwarlu EggadI, Umasankar Kulandaivelu, Rajamohan Bandari, Evaluating the Outcomes of Surgical Versus Conservative Treatments in Head Injury: A Comparative Observational Study Using Different Scales, Indian Journal of Pharmacy Practice, Vol 13, Issue 2, Apr-Jun, 2020.

[15] Zafonte R, Fried Ewald WT, Lee SM, Levin B, Diaz-Arrastia R, Ansel B, *et al*. The citicoline brain injury treatment (COBRIT) trial: Design and methods. Journal of Neurotrauma. 2009; 26(12): 2207-16.

[16] Neha S. Jadhav, Avinash S. K, Conservative Management of Traumatic Brain Injury, J. Evolution Med. Dent. Sci./eISSN- 2278-4802, pISSN- 2278-4748/ Vol. 7/ Issue 36/ Sept. 03, 2018.