

Epidemiology of Traumatic Brain Injury (TBI) in UAE – A Review

FAIQA FILZA KHAN, AFRA MUHAMMAD RAFIQUE, IMAD HAHSIM AHMAD

Department of Neurosurgery, Rashid Hospital, Dubai UAE

ABSTRACT

Objective: To evaluate the causes and pattern of Traumatic Brain Injury (TBI) in Dubai, UAE.

Material and Methods: This descriptive study was carried out at Rashid Hospital, Dubai UAE from June 1, 2008 to August 27, 2008. All the patients admitted to neurosurgical unit referred from A&E were included and the total no. was 96 patients in this short study. Demographic data, causes and pattern of injury and presentation with clinical and radiological findings were recorded.

Results: Most of the patients were young males (7.7:1) in the age range of 21 – 30 years. RTA being the most common (45%) cause in non-Arab expatriate population and 49 patients had minor injuries only with the rest included in moderate to severe category. The results were consistent with the international studies.

Conclusion: Traumatic Brain Injury (TBI) is a potentially preventable cause of mortality and morbidity in young population world over and still there is a need for formulating new strategies to avoid it.

Key words: TBI, RTA.

Abbreviations: TBI; Traumatic Brain Injury, mTBI: mild traumatic brain injury, GCS: Glasgow Coma Scale.

Introduction;

Traumatic Brain Injury (TBI), moderate though, is a major public health problem. Relatively much is known about different types of mechanisms involved in head injuries, the ultimate degree of neurological recovery in many patients is difficult to predict accurately. In young individuals, TBI is the major cause of morbidity and mortality in any given population. Even in mild traumatic brain injury (mTBI) cases, subtle behavioral and neuropsychological changes could make a person great burden on the society. The principle causes of such injuries include transport accidents, falls, violence, and injuries occurring at work, in the home and during sports.

The United Arab Emirates, population of about 4 million, is the most westernized country in the Arabian Peninsula. The total area of UAE is around 77,700 sq kilometers; it is located in the Middle East, bordering the Gulf of Oman and the Persian Gulf, between Oman and Saudi Arabia. After the discovery of oil in recent past, UAE as a whole has shown tremendous develop-

ments in the last few decades Dubai one of the largest cities of UAE, population 1.3 million, the financial centre of UAE is attracting corporate headquarter of international companies. Professional sports, music events and annual shopping festivals are hosted in Dubai. It is considered to be the most glamorous city in this region. A. Bener and D. Crundall reported in an article published in “Advances in transportation studies”, in May 2005 that road traffic accidents are a major health hazard in UAE due to rapid advancement and increase in no. of vehicles on roads, leading to a high rate of morbidity, disability and death.

The population of Dubai is increasing at a considerably rapid rate, and the city has a very large no. of car accidents, so a study was undertaken at Rashid Hospital Trauma Centre to assess the epidemiology of traumatic brain injury.

The Rashid Hospital has 600 beds and provides tertiary – level care services. RHTC, completed in mid-2006, is the busiest Emergency Department in the region, RHTC has a trauma OR, a trauma ICU with

eight beds, a 10 – bed post-anesthetic Recovery Room, and two Surgical trauma wards which together have 45 beds.

RHTC is the primary referral centre for all trauma patients in Dubai and neighboring areas. If primary prevention is to be targeted against the root causes of a problem, we must understand the magnitude of the problem and the leading factors specific to this region.

MATERIAL AND METHODS

The study was conducted at Rashid Hospital, trauma centre, Dubai. All cases reviewed were of 03 months duration, i.e. from June 01, to August 27, 2008. These were referred from A/E department to neurosurgeons,

and were admitted under neurosurgical care.

The cause, specific age groups involved and type of injury were recorded. Minor cases managed and discharged by ED, and those admitted under other specialties were excluded.

The study design is descriptive study.

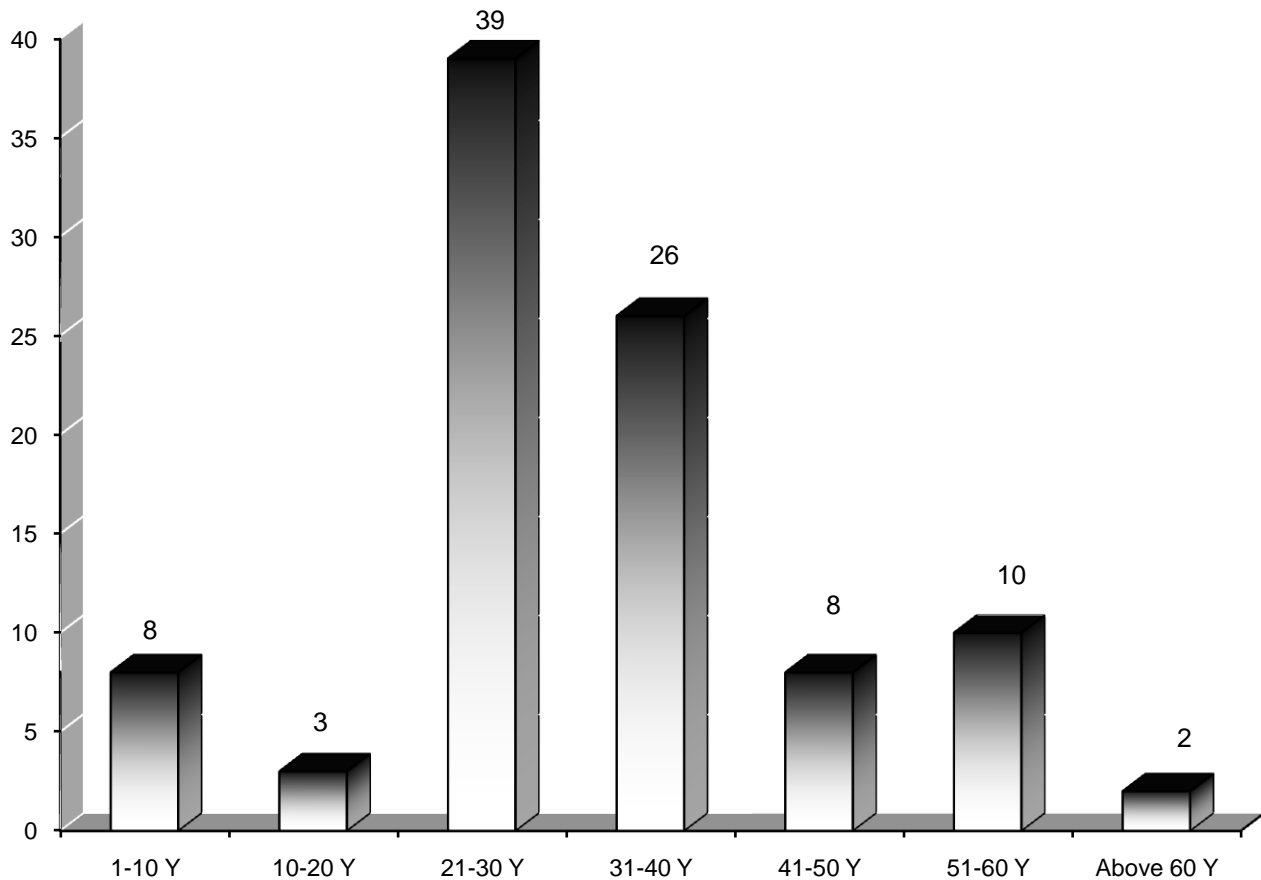
As purpose of the study was to have an estimate of epidemiology, so treatment strategies and outcome of these patients were not discussed.

RESULTS

Total no. of traumatic brain injuries in 03 months duration (June 01, 2008 – August 27, 2008) = 96
Parameters:

Table 1: Age Incidence.

	1 – 10 Y	11 – 20 Y	21 – 30 Y	31 – 40 Y	41 – 50 Y	51 – 60 Y	^ 60 Y
Male	4	3	35	25	7	10	1
Female	4		4	1	1		1



Graph 1:

Incidence

A total of 96 patients were admitted under neurosurgical care as diagnosed cases of head injury. The duration was about 03 months i.e. from June 01 to August 27, 2008. All these patients were referred from A/E department, Rashid Hospital. The incidence of head injuries typically includes only those patients who were admitted to hospital.

Emergency department (ED) managed cases were not counted in this study. Admission criteria were clinical (ranging from headache or post-traumatic amnesia to coma) and radiological (CT scan findings).

For a population of 4.3 million with around 80% expatriates, the incidence of head injuries in UAE was more (82%) in expatriates as compared to local population.

Age

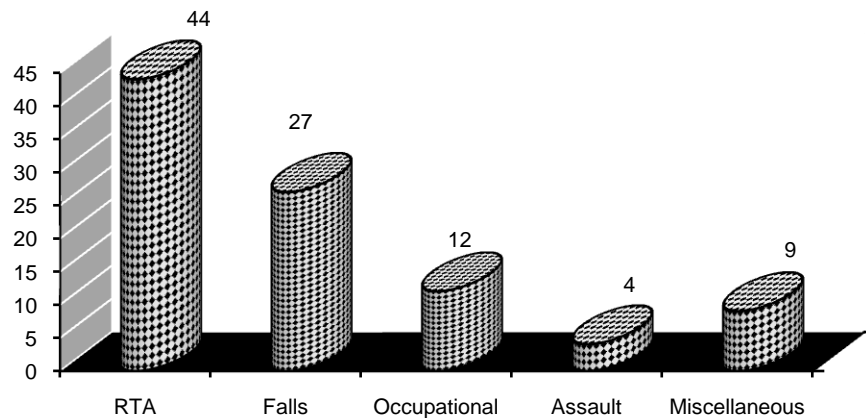
Out of 96 reviewed patients, the greatest proportion of these head injury patients was in the age range of 21 – 30 years old group (40%). The 2nd peak occurring in 31 – 40 years (27%). The number of patients was equal between age groups of 1 – 10 years and 41 – 50 years i.e. 8 patients in each group. Only 3 patients were from age group

Table 2: Gender distribution.

Male	Female
85	11

Table 3: Mode of trauma.

	RTAs	Falls	Occupational	Assault	Others
Male	37	23	12	4	9
Female	7	4			



Graph 2: Mode of Injury.

Table 4: Mode of Injury.

No.	Mode of Trauma	Types
1	RTA – 44	Car/Pickup – 33 Pedestrian – 14 Motorbike – 4 Bicycle – 3
2	Fall – 27	Roof top – 18 Slipped in bathroom – 3 Stairs – 2 Mother’s lap – 2 Slipped from horse – 1 Fell from bed – 1
3	Occupational – 12	Mechanical job in heavy industry
4	Assault – 4	Blunt objects
5	Miscellaneous – 9	

Table 5: Severity.

GCS 13 – 15	GCS 9 – 12	GCS less than 8
49	26	21

11 – 20 years. Ten patients were between 51 – 60 years and 2 above 60 years (Table).

Gender

Of the 96 patients, 85 were male and 11 female, giving a ratio of 7.7: 1.

Mode of Trauma

Transport accidents accounted for 45% of the admissions (table showing the distribution between different modes of trauma). Out of all these accident patients, 3 were bicycle injuries, 23 car accidents (driver /

passenger), 14 were pedestrians and 4 motorcycle accidents. These motor bike injuries could be included in sports injury as well, because 2 of them were racing in desert as a sport.

Thirty seven of the transport accidents patients were male and 7 were female. Majority of them were young (between 13 – 44 years). Two patients who were involved in pedestrian accidents were aged 56 and 58 years. One 11 months infant was reported to have met RTA being in the lap of his mother as passenger.

Fall, the 2nd major cause accounted to 28% of the admissions with 23 male and 4 female patients. Four out of 23 male patients were reported to be under the effect of alcohol. Three patients had a history of slipping in the bathroom, one of them was elderly, 66 years old lady.

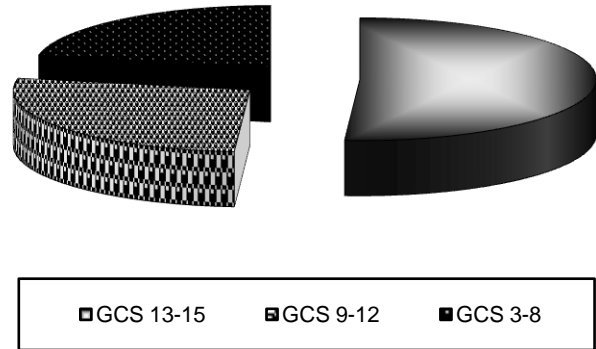
One male patient fell from horse, two infants fell from mother’s lap both were female. Two male patients fell from stairs, and one drunken patient fell from his bed and hit his head against the side table. Rests of the cases were fall from height.

Four patients were admitted for head injury due to physical assault with blunt objects, all were male. The no. of patient who suffered from head injury during work was 12. They were involved in mechanical work of heavy industries.

Nine patients were included in the category of miscellaneous. In these cases one patient suffered from myocardial infarction and fell down injuring his head too. One patient had a fall of wooden object and another metallic object over his head. Water tank fell over one patient causing a severe head injury.

Severity

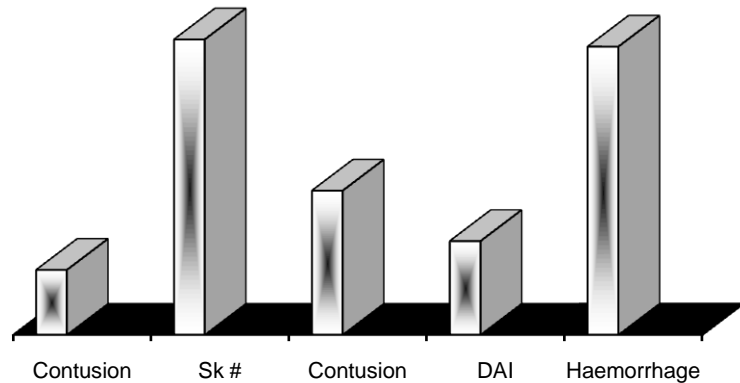
The majority of subjects had mild injuries as shown in table i.e. 49 patients were in the GCS range of 13 – 15.



Graph 3:

Table 6: Type.

Concussion	Skull Fracture	Contusions	Anoxia / Oedema DAI	Haemorrhages
9	41	20	13	40



Graph 4:

Table 7: Presentation.

LOC	Vomiting	Headache	Amnesia	ENT bleed	Drowsy/Confused / Altered sensorium	Fits
35	26	12	3	12	49	4

Twenty six patients were in GCS 8 – 12 and only 21 patients were in GCS 8 or below. Severity patterns were not influenced by age or gender in this study.

Table 8: Pupils.

Both Normal	Both Dilated	Unequal
78	6	12

Table 9: Associated Injuries.

Facial #	Long bone #	Abdominal	Chest	Spine #
18	21	4	7	10

Presentation

Clinical picture on arrival was as follows; loss of consciousness in 35 patients, vomiting in 26 patients and headache in 12 patients. Eighteen patients presented with confusion, drowsiness or posttraumatic amnesia. Twelve had and ENT bleeds, from nose in 4 patients and from ear in 8 patients (table).

Four patients presented with fits. These are not isolated symptoms to be present on admission. Most of the patients had multiple of the above mentioned complaints at the same time. The have been noted down separately for the purpose of documentation.

Pupils

Pupils were examined in each patient as part of the neurological assessment and their size, symmetry and reactivity were recorded. Six patients had bilaterally dilated pupils on arrival to trauma centre. Twelve patients arrived with one dilated pupil either right or left. Rest of the patients exhibited normal size and reactivity of pupils.

Radiological Findings

Radiological findings were base mainly on initial CT scan brain done in the radiology department of trauma centre. Forty one patients had skull fractures, linear in 33 and depressed in 8 patients. Twenty patients had small contusions, 40 patients suffered from intracranial haemorrhages either SDH, EDH, SAH or ICH. Diffuse axonal injury, anoxia and brain oedema cases accounted to 13 in total. Nine patients had a normal CT scan brain.

Associated Injuries

Apart from head injury, the following associated injuries were recorded in all of these 96 patients. Facial

fractures 18 patients, long bone fractures 21 patients, spine fractures 10 patients, blunt abdominal injury 4 patients and blunt chest trauma, including rib fractures and lung contusions in 7 patients.

DISCUSSION

Some general trends are universal for TBI, mainly mTBI regarding causes, age groups involved (i.e. young adults and adolescents) and gender differentiation i.e. males are at higher risks than females.

Incidence of TBI reported in literature is around 200 per 100,000 per anum. The incidence and nature of head injury in Dubai as evident from the data gained from this study was comparable in many respects with the international figures but a conspicuous finding was a very high incidence of trauma exceeding those reported by US, UK, and French studies.^{2,3,4} Susan L Hillier et al noted a high incidence of TBI in South Australia but our figures are even higher than that. The most common underlying cause being RTA as reported in international studies, but in Dubai the figures are dramatic, constituting the 2nd cause of death in nation¹ after CVA. The alarming factor here is that not only the incidence is high but also the contributing factor to these auto accidents is driver's careless behavior. Though wearing seat belts while driving is a law and is strictly enforced yet general trends of violations, lapses and errors and are higher among UAE population. Like in any developed western country, the time span between trauma and arrival of the patient to Rashid hospital was not very long and in certain instances it was just within half hour using an air ambulance which is a good factor in ultimate outcome of head injury patients but unfortunately this could not control the high incidence. UAE is a fastly developing nation with annual increase of no. of vehicles on roads. Also population growth is 3% per anum. This kind of variable needs to be addressed to avoid worsening of situation in the future. Apart from enforcing road safety measures and traffic laws, general public education is also mandatory.

Electronic media should be utilized for awareness regarding sequels of road trauma especially TBI and its overall impact on the society. Strategies are to be planned to reduce the incidence of trauma in UAE, more education, training and change of attitude is required. No doubt as a young nation UAE showed tremendous advancement in the field of technology and roads construction, the general pattern of behavior needs to be changed also.

CONCLUSION

The goal of neurosurgeon in managing Traumatic Brain Injury (TBI) is to prevent secondary brain damage, and reducing the morbidity and mortality. To do this effectively, considerable attention must be directed to all phases of patient management. This includes provision of facilities and staffing at trauma centre, Rashid Hospital to cope with the huge number of accident patients in this region.

But above all as the famous saying goes; ***Prevention is better than cure.***

If prevention is ignored, neurosurgeons would never be out of trauma work load. Success in injury prevention will prove to be another measure of the advancement of our civilization.

Address for Correspondence:

Dr. Faiqa Filza Khan

*Department of Neurosurgery, Rashid Hospital
Dubai UAE*

REFERENCES

1. Bener A, Crundall D. Road traffic accidents in UAE compared to western countries. *Advances in Transportation Studies*. 2005; 6: 5-12.
2. John Bruns Jr, Allen Hauser W. The epidemiology of Traumatic Brain Injury: A Review. *Epilepsia* 2003; 44 (suppl. 10): 2-10.
3. Susan L, Hillier, Janet E, Hiller, Jacques Metzger. Epidemiology of traumatic brain injury in South Australia. *Brain Injury* 1997; 11 (9): 649-59.
4. Peter G Harradine, Julie B Winstanley, Robyn Tate, Ian D Cameron, Ian J Baguley, Ross D Harris. Severe traumatic brain injury in New South Wales: comparable outcomes for rural and urban residents. *MJA* 2004; 181 (3): 130-34.