Journal Homepage: -www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/7246
DOI URL: http://dx.doi.org/10.21474/IJAR01/7246

RESEARCH ARTICLE

PREVELANCE OF TRAUMATIC BRAIN INJURY (TBI) IN SUMMER MONTHS OF 2017 IN HAIL, KSA.

Amany M. Khalifa, Reem S. Albalawi, Shada K. Bashantoof, Aljoharah M. Alwajaan, Afrah A. Altamimi[2] and Zahra M. Khormy[2].
Faculty of Medicine, Hail University, KSA.
Data collecter[2], Hail University, KSA.

Manuscript Info

Manuscript History

Received: 10 April 2018
Final Accepted: 12 May 2018
Published: June 2018

Keywords:-
Viral hepatitis, Taraba State , Prevalence, Healthcare

Abstract

Background and objective: Traumatic brain injury (TBI) is one the most dangerous injuries worldwide. The effects of TBI can be profound and may result in long-term unresponsive states. Tell now there is no enough conductive studies in Hail region regarding it. The current study aimed to report the importance of head injuries in Hail region and correlate the incidence with age, sex, occupation, cause and types.
Material and Method: The database registry was retrospective study, hospital-based to any head trauma referred to neurosurgery department, KKH, Hail.
Results: 121 patients were attending the neurosurgery department of KKH. The prevalence of head trauma among patients was 76%. The highest age group was 12 years and less (38.0%), (45,7%) of them were diagnosed as brain trauma. RTA was the leading cause of TBI (55.4%), while 44.6% were due to fall down. Surgical intervention as management was only 20.7% while other management procedures were 79.3%.
Conclusion: There is a significant relationship between age and head trauma. The most affected group were children under 12 years. Males were more common than females. The impact of TBI in Hail region requires more observation and prevention programs to improve the health and reduce the risk from remarkable increasing in the following years.

Copy Right, IJAR, 2018,. All rights reserved.

Introduction: -

Traumatic brain injury (TBI) is a non-degenerative, non-congenital insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions, with an associated diminished or altered state of consciousness. (1) The most common etiological factors for TBI are falls, road traffic accidents, violent physical assaults, and injuries associated with athletic activities. (2)

Following TBI, significant neurologic complications may occur which include seizures, dementia, Alzheimer's disease, and cranial nerve injuries. In addition, people may suffer from various psychiatric complications such as depression, posttraumatic stress disorder, generalized anxiety disorder, obsessive-compulsive disorder, and other cognitive and behavioral sequel that might significantly increase the comorbidity of the victims. (2)

Corresponding Author:- Amany M. Khalifa.
Address:- Faculty of Medicine Hail University.

According to the CDC (United States Centers for Disease Control and Prevention), there are approximately 1.5 million people in the U.S. who suffer from a traumatic brain injury each year. [3] Approximately 50,000 Americans die each year following traumatic brain injury, representing one third of all injury-related deaths. [4]

Research towards injury etiology and risk factors remained the key factor leading to any successful prevention program. [5]

Aim of the study: -

The present work was a retrospective study aimed at threw light on the importance of head injuries in Hail region which was reflected by their prevalence in the summer months of (2017). The study also was correlating the prevalence with age, sex, cause and types.

Material:-

The present work was a retrospective cohort study. It incorporated the brain trauma cases, from June 2017 to August 2017, who admitted the King Khalid neurosurgery department and recorded in database of KKH.

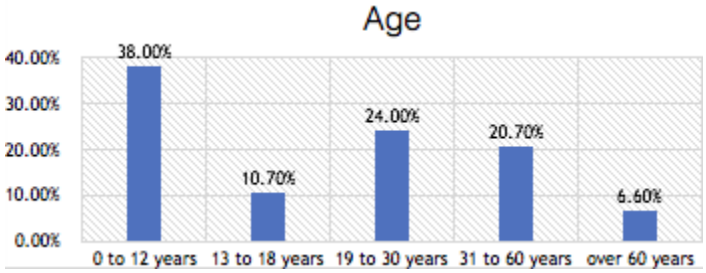
Methods:-

The data collected was following the cases from the time of admission till the final discharge. The prevalence was studied using SPSS program [6] , as regards age, gender, cause, route of admission, head trauma, severity. LOC, GCS scale, CT brain, management, admission, complication, hospital stay, prognosis and discharge.

Results:-

During the period of summer months of 2017, 121 patients were identified. 46 (38.0%) were 12 years and less. 42 (45,7%) of them were diagnosed with head trauma. 24% of patients were between 19 and 30 years old. Also 20.7% were in age group of 31 to 60 years old, and 10.7% of patients aged 13 to 18 years. The lowest percentage (6.6%) were seen in elderly patients over 60 years old. (Figure 1) .

Figure 1: -Age distribution of TBI patients.



The majority (76%) of patients were Saudis, while only 24% were other nationalities (Figure 2).

Figure 2: -Nationality distribution.

Males were more affected than females (83.5% vs16.5%) (TableIII, figure3).

Figure3:-Gender distribution.

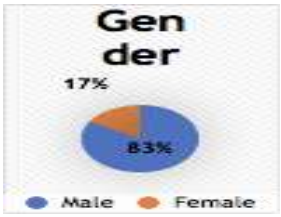


Table lll:-Gender distribution.

		Count	Table N %
Gender	Male	101	83.5%
	Female	20	16.5%

The highest route of patient's admission was Emergency department (83.5%.) (Figure 4).

Figure 4:-Route of admission of TBI patients.

The prevalence of head trauma among patients was 76% (76.1%were mild,9.8% were moderate and 14.1% were sever). (TablelV)

TablelV:-Severity of head trauma.

		Count	Table N %
Head trauma	No	29	24.0%
	Yes	92	76.0%
If yes (n=92)	Mild	70	76.1%
	Moderate	9	9.8%
	Sever	13	14.1%

Only 28.3% of patients with head trauma had loss of consciousness. GCS scale evaluation showed that 69.6% of them were mild, while 15.2% were sever and moderate as well. (TableV)

Table V:-Head traumatic patients evaluation.

		Count	Table N %
Loss of consciousness	No	62	67.4%
	Yes	26	28.3%
	No data	4	4.3%
GCS scale	Sever	14	15.2%
	Moderate	14	15.2%
	Mild	64	69.6%

Overall, RTA was the leading cause of TBI (55.4%), while 44.6% were due to fall down..(TableVI)

Table VI:-Causes of head traumatic patients.

		Count	Table N %
cause	road traffic accident	51	55.4%
	Fall down	41	44.6%
	Assault	0	0.0%
	Work related	0	0.0%
	Other	0	0.0%
	No data	0	0.0%

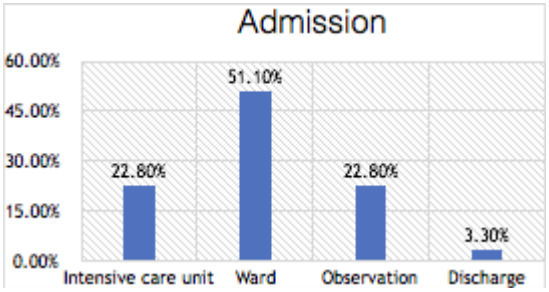
CT brain showed that mild head trauma was highest diagnosis observed (33.7%), skull fracture in 12% of cases, and then subdural hematoma (7.6%). Findings showed that normal CT brain was seen in 20.7% of patients who had head trauma (TableVII).

Table VII:-CT finding in patients with head trauma.

CT brain	Count	%
Epidural hematoma	2	2.2%
Epidural hematoma and subdural hematoma	2	2.2%
Epidural hematoma and skull fracture	1	1.1%
Subdural hematoma	7	7.6%
Subdural hematoma and skull fracture	2	2.2%
Subdural hematoma and subarachnoid hemorrhage	1	1.1%
Skull fracture	11	12.0%
Skull fracture, contusion and other	1	1.1%
Skull fracture and mild head trauma	2	2.2%
Skull and fracture and subarachnoid hemorrhage	1	1.1%
Contusion	4	4.3%
Contusion and mild head trauma	2	2.2%
Contusion and subarachnoid hemorrhage	2	2.2%
Intracranial hemorrhage	2	2.2%
Other	2	2.2%
Mild head trauma	31	33.7%
Subarachnoid hemorrhage	0	0.0%
No finding (normal)	19	20.7%

According to admission,51.1% were admitted to ward, while 22.8% to observation and 22.8% to intensive care unit. Only 3.3% were discharged. (Figure5)

Figure5:-Admission distribution.



Therefore, surgical intervention as management for head traumatic patients was only 20.7% while other management procedures were 79.3%. There were some injuries associated with head trauma, such as chest trauma (7.6%) as highest percentage. (TableVIII)

Consequently, only 15.2% from head traumatic patients had complications. (Figure6)(TableVIII)

Figure 6:-Complication distribution.

TableVIII:-Management of cases.

		Count	Table N %
Admission	Intensive care unit	21	22.8%
	Ward	47	51.1%
	Observation	21	22.8%
	Discharge	3	3.3%
Management	Surgical	19	20.7%
	Other	73	79.3%
Associated injury	Chest trauma	7	7.6%
	Chest trauma and abdominal	2	2.2%
	Chest trauma, abdominal, and lower limb	1	1.1%
	Chest trauma, abdominal, and other	2	2.2%
	Chest trauma and upper limb	1	1.1%
	Chest trauma and lower limb	1	1.1%
	Chest trauma, lower limb, and other	1	1.1%
	Chest trauma and other	3	3.3%
	Abdominal	2	2.2%
	Abdominal and lower limb	1	1.1%
	Abdominal and other	1	1.1%
	Upper limb	4	4.3%
	Lower limb	0	0.0%
	Other	6	6.5%
	No finding	60	65.2%
complication	No	78	84.8%
	Yes	14	15.2%

As monitoring for head traumatic patients, Figure7showd that 90.2% of them were hospitalized.

Figure7:-Hospital stay distribution.

In whom 77.1% stayed less than 1 week, while only 6% stayed more than one month. In tableIX, 84.8% of head traumatic patients improved, while 7.6% died. Accordingly, as a result, 92.4% of patients with head trauma were discharged.

TableIX:-Head traumatic patients prognosis and discharge situation.

		Count	Table N %
prognosis	Improved	78	84.8%
	Worsen	0	0.0%
	Death\expired	7	7.6%
	Transfer	4	4.3%
	Other	2	2.2%
	No data	1	1.1%
discharge	Yes	85	92.4%
	No	0	0.0%
	No Data	7	7.6%

Discussion:-

The present work was a retrospective study that aimed at spotting light on the importance of TBI in Hail region. The present work is the first research in Hail region to report the prevalence of TBI, in the summer months of 2017.The study was also correlating the prevalence with age, sex, cause and types.

In summer months (June, July and August) of 2017, the highest prevalence was recorded in age group of 12 years and less. (38.0%) . The second high prevalence was seen in adolescence age (24%) of patients aged 19 to 30 years old. The lowest percentage (6.6%) was in elderly patients over 60 years old. Similarly, Alhabdan et al[(7)] in 2013 in Riyadh government , capital of KSA, reported that 32.1% suffered head injury with mean age 8.6 years. They concluded that preschoolers and elementary school students were mostly affected. They also added that Head injury is a major cause of mortality, morbidity and disability in children.

A lower prevalence of 7.4% of total injury of patients less than 14 years in USA [(8)] . Also, a report by Ivan et al showed a head injury rate of 8.8% among pediatric emergency admissions in a Canada.[(9)]The difference in prevalence rate may be explained by the application of different injury prevention programs that can reduce morbidity and mortality specially in children. The use of seatbelts, helmets for motorcycles and bicycles and babies seats can reduce the incidence of cranial and non-cranial injuries.[(10,11,12)]

According to The GCS scale evaluation, the present study found that there's a significant relationship between age and the GCS scale. The most affected patients have a mild GCS scale of 69.6%. This finding is in agreement with study conducted in Tabuk (Sara M. Elsiddig et al-tabuk) [(13)] that reported (44.9%) presented with mild injury (GCS; 13 – 15). The disparity between the two percentage might be due to the larger number of patients (551) in their study. They also observed a strong correlation between patient's fatality outcome and their GCS scale. In contrast with similar study in the capital city of KSA, Riyadh [(14)] which approved that highest percent (56.7%) had a severe THI (GCS 3-8) followed by 30.3% with mild THI (GCS13-14). It may reflect the aggressive leading cause in riyadh city which is MVC.

In the present work, in Hail region, the most common cause of TBI was road traffic injuries 55.4% Followed by fall down 44.6% especially in children which is similar to other studies in the Gulf Cooperation countries such as Qatar and United Arab Emirates. AymanEl-Menyar et al [(15)] explained that it's due to the fact that only 5% were using a seatbelt/restraint system. Underutilization of seatbelt among people in KSA is strongly associated with higher morbidities and mortality. We noticed that most TBI patients are non-surgically managed 79.3% as most of the traumas were mild and most commonly admitted to the wards. In the United States, approximately 95 per 100 000 have severe head injuries to require hospital admission every year [(16)].

The present study found that the percent of patients who have had complications due to TBI was 15.2% while other study in Riyadh reported that 19.6% of trauma patients developed complications which might be due to several factors: first, the rate may influenced by patient's condition which is highly different from one another [(17)] . Second: hospital quality, quality is a critical and essentially required especially in relation to practicing and complication development. Finally, unmeasured factors could influence the rate. [(18,19,20)]

During the 3-month study period, in the present study, 76.0% of neurologic patient had a traumatic head injury; only 28.3% of them had a loss of consciousness. A lower percentage was reported by Abdullah AL-Kuwaiti et al

(2012)[21] who found in his research done in United Arab Emirates that only 22.9%patients had Traumatic brain injury [21] . The difference may be due to difference in age, gender or accompanying lesions. Also it might be due to the fact that Saudi Arabia has more population than UAE which means more traffic [21] .

In the present work, the majority 76% of patients were Saudis, in another study conducted in Tabuk (2017) [13], Saudi Arabia also reported that the majority of their patients were also Saudis 78.8% [13]. This could be explained by the fact that the majority of populations were Saudis. Also the high risk of car accidents was more in Saudis.

The present study also discovered that 83.5% from the total patients were males. This could be due to the fact that in Saudi Arabia women are not allowed to drive at the time of the research. Also, a study was done in Saudi Arabia in 2013 [7], males were more affected than females 78.4% vs. 21.6%. [7]

In the present work, the diagnosis of the type of injury was according to CT brain finding. CT brain showed that mild head trauma was the highest diagnosis observed 33.7%, skull fracture in 12% of cases, and then subdural hematoma 7.6%. Contrary, a higher results of another study done in Qatar were 61.70% skull fracture ,24% subdural hematoma.[15] This might be due to different causes since car accidents increase the risk of these signs.

In the present study, 90.2% of all cases were hospitalized. However, a study done in United States, 2002-2006[22] showed that 15.1% of all injuries were hospitalized and 0.7% of all visits were hospitalized [22] .In USA there are lots of traffic rules and lows to control and prevent car accidents . Other major reasons for the increase were more fall-related TBIs and overall population growth. It is also likely that the public's awareness of TBI contributed to increased treatment [22].

The present research clarified that the majority of patients had multiple injuries. The most commonly injured body region was the chest (7.6%). Other finding was abdominal injury in 2.2% and upper limb 4.3%. However, in a study conducted in the United Arab Emirates, the most commonly injured body region in association with hospitalized head-injured patients was the upper limbs 28.4%, chest injury 21.7% and abdomen injury with 4.8% [21]. The higher percentages of associated lesions could be due to vehicle accidents which resulted in multiple severe lesions in their patients. Also, the explanation of another paper done in Arar Saudi Arabia, was that the most frequent occurrences of RTC were angle collision (40.8%), back collision (19.9%), and hitting a fixed object (13.3%)which in mechanism could lead to multiple injury . [23]

Our present study had shown that the 84.8 %of the patients have been improved and discharged, and the mortality was 7.6% who died in the hospital. A study carried out in United Arab Emirates showed that more than one-third of their patients were discharged within 48 hours and the overall mortality in their study was about 6%, which is nearly similar to the present research [21].

Conclusion and Recommendations:-

During the period of summer months of 2017, children ,12 years and less, were the mostly affected of TBI in Hail region (38.0%). Males were more common than females. Although the mortality was only 7.6%, yet TBI in Hail region necessitates more care, observation, preventive programs and firm action packages of traffic laws to improve the health and reduce the risk from remarkable increasing in the following years.

Acknowledgement:-

The authors would like to acknowledge the consultant in neurosurgery department, King Khalid Hospital; Dr. Muhammad Yaseen Rauf to his great effort, major help and support to conduct this research, Also the authors are thankful to the officers at the King Khaled Hospital , Hail, KSA .

References:-

1. Lee B, Newberg A. Neuroimaging in traumatic brain imaging. NeoroRx. 2005. 2(2):372-383.
2. Ahmed S, Venigalla H, Mekala HM, Dar S, Hassan M, Ayub S. Traumatic brain injury and neuropsychiatric complications. Indian J Psychol Med 2017;39:114-21
3. Sosin DM, Sniezek JE, Thurman DJ. Incidence of mild and moderate brain injury in the United States, 1991. Brain Injury 1996;10:47-54.
4. Sosin DM, Sniezek JE, Waxweiler RJ. Trends in death associated with traumatic brain injury, 1979 through 1992. JAMA 1995;273:1778-80.
5. MacKenzie eJ. epidemiology of injuries: current trends and future challenges. epidemiol rev. 2000;22(1):112-9.
6. IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
7. Alhabdan S, Zamakhshary M, AlNaimi M, Mandora H, Alhamdan M, Al-Bedah K, Al-Enazi S, Al-Habib A. Epidemiology of traumatic head injury in children and adolescents in a major trauma center in Saudi Arabia: implications for injury prevention. Ann Saudi Med. 2013 Jan-Feb;33(1):52-6.
8. Reid Sr, roesler JS, Gaichas AM, tsai AK. The epidemiology of pediatric traumatic brain injury in Minnesota. Arch PediatrAdolesc Med. 2001 Jul;155(7):784-9.
9. Ivan lP, choo Sh, Ventureyraec. Head injuries in childhood: a 2-year survey. can Med Assoc J. 1983 Feb 1;128(3):281-4.
10. Kleiven S, Peloso PM, von holst h. the epidemiology of head injuries in Sweden from 1987 to 2000. inj Control SafPromot. 2003 Sep;10(3):173.80.
11. Hefny AF, barss P, Eid hO, Abu-Zidan FM. Motorcycle-related injuries in the united Arab Emirates. Accid Anal Prev. 2012 nov;49:245-8.
12. Al-habib A, Attabib n, hurlbert rJ. rec.reational helmet use as a predictor of noncranial injury. J trauma Acute Care Surg. 2012 May;72(5):1356-62.
13. Elsiddig SM, Farahat HH, Mahmoud AA, Amri M, Ajwah IM, Ajwah AM. Causes , patterns , and mortality of traumatic head injuries in a Tertiary Hospital in Tabuk , Saudi Arabia. Basic Res J MedClalinSci 2017; 6(9):93–8.
14. Al-Habib A, A-shail A, Alaqeel A, Zamakhshary M, Al-bedah K, AlQunai M, et al. Causes and patterns of adult traumatic head injuries in Saudi Arabia: implications for injury prevention. Ann Saudi Med 2013; 33(4): 351-355.
15. El-Menyar A, Consunji R, Al-Thani H, Mekkodathil A, Jabbour G, Alyafei KA. Pediatric Traumatic Brain Injury: a 5-year descriptive study from the National Trauma Center in Qatar. World Journal of Emergency Surgery : WJES. 2017;12:48. doi:10.1186/s13017-017-0159-9.
16. Adekoya N, Thurman DJ, White DD, Webb KW. Surveillance for traumatic brain injury deaths - United States,1989-1998. Morb Mort Weekly Rept. SurveillSumm. 2002. 51(10);1-16
17. Alghnam S, et al. Burden of traumatic injuries in Saudi Arabia: lessons from a major trauma registry in Riyadh, Saudi Arabia. Ann Saudi Med. 2014 Jul-Aug;34(4):291-6.
18. Brill JC, Geiderman JM. A rationale for scoop-and-run: Identifying a subset of time-critical patients. AdvEmergNurs J. 1981;3(2):33-44.
19. Galvagno SM, Thomas S, Stephens C, et al. Helicopter emergency medical services for adults with major trauma. Cochrane da- tabaseSyst Rev. 2013;3(3):CD009228.
20. Jr SMG, Haut ER, Zafar SN, Millin MG, Efron DT, Koenig GJ, et al. Asso- ciation between helicopter vs Ground Emergency Medical Services and Sur- vival for Adults With Major Trauma. Jama. 2012;307(15):1602-1610.
21. Abdullah Al-Kuwaiti, Ashraf F Hefny, AbdelouahabBellou, Hani O Eid, Fikri M Abu-Zidan. Epidemiology of head injury in the United Arab Emirates. Ulus TravmaAcilCerrahiDerg. 2012; 18(3): 213-218
22. Faul M, Xu L, Wald MM, Coronado VG. Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations and Deaths 2002-2006 . Atlanta (GA): CDC; 2010. 1-74
23. AlshammariMuharib M, AboEl-FetohNagah M, , et al . A study on road traffic accidents in Arar, Saudi Arabia. Egypt J Surg.2017; 36(4) :451-6