Outcome of Patients with Moderate and Severe Head Injuries in South Valley University Hospitals

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Abstract

Background: Traumatic brain injury (TBI) is a major health problem, as it is responsible for mortality and long-term morbidity worldwide. Lately, head injury cases have increased in both developed and developing nations.

Objectives: The study was conducted on selected cases of moderate and severe traumatic head injuries that referred to Neurosurgery department in South Valley University Hospital, to evaluate outcome and medico legal aspects following head injury.

Patients and methods: The total number of selected cases was 200 cases. The data collection sheet enclosed personal data (age, gender, and residency), incident associated data (cause, manner, and time of injury) and both, clinical and imaging investigation.

Results: Most of the cases were males in the age group (40-59) years. The most affected sites were temporo-parietal sites. The almost outcome was complete recovery (46%). The commonest abnormal CT findings were intracranial hemorrhages (subdural hematoma 68%). According to GCS about (58%) of the cases had moderate head injuries (GCS 9:12), and (42%) of the cases had severe head injuries (GCS less than 8).

Conclusion: Severe traumatic brain injury (TBI) has a higher mortality and morbidity than moderate TBI. It has a high impact on middle age people, especially men. Most cases received conservative treatment; large number of the cases had full recovery. GCS at admission and the CT scanning are significant predictors of outcome.

Keywords: Traumatic head injury, Outcome, CT finding.

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Introduction

Traumatic brain injury (TBI) is an insult to the brain from an external mechanical force, It may lead to temporary or permanent change of cognitive, physical, and psycho social functions, with an associated decreased or changed state of consciousness **(Jang, 2009).**

TBI affects individuals of all age groups both young and old age, but common in male population **(Shivaji et al ., 2014).** TBI was proposed by the World Health Organization (WHO) to become the third leading cause of world-wide mortality and disability by the year 2020 **(Tran et al., 2015).**Severe traumatic brain injury is associated with a high mortality and morbidity rate and is one of the main causes of death in the intensive care units .Pre-injury factors as age, associated injuries, a history of previous head injury, alcohol abuse, and lower socioeconomic and educational level have been related to raised mortality and worse outcome after TBI (**BaguNottley et al., 2012; peeters et al., 2016).**

Though primary brain injury caused by direct impact on the skull and brain can lead to mortality or severe disability. Secondary brain injury resulting from hypoxia, hypotension, edema, and formation of hematoma cause the most worsening signs, and symptoms of TBI (**Nolan, 2005**). The major causes of TBI worldwide are falls, motor vehicle accidents, war assaults**,** child abuse, and sport related injuries (**Wojcik et al., 2010**; **Peeters et al., 2015).**

According to Glasgow coma scale (GCS), TBI is classified into mild (14–15), which is termed as concussion, moderate (9–13), and severe (3–8) **(Mena et al., 2011).** In 2014, a new approach was recommended by the Centers for Disease Control and Prevention (CDC) for TBI classification **,** where new parameters have been added to explain the deficit in GCS that only includes in its assessment the level of consciousness (LOC), and ignores clinical signs such as pupil reflexes **(Chieregato et al., 2010)** .The new parameters planned have included the Abbreviated Injury Scale, LOC and its duration, post-traumatic amnesia, and evidence of brain involvement on structural imaging**(Brasure et al ., 2014).**

Extradural hematomas usually occur when the middle meningeal artery bleeds into the extradural space. This can occur sometime after the head injury and should be considered in any patient with deterioration following an apparently good recovery after trauma to the head. Extradural /Epidural hematomas are caused by bleeding from an artery or a large vein (venous sinus) located between the skull and the dura matter. Bleeding often occurs when a skull fracture tears the blood vessel (**Kanematsu et al., 2018).**

Subdural hematoma results from the accumulation of venous blood in this potential space, which is easily distended by blood under venous pressure. Because the dura and arachnoid are only loosely attached to each other, this is the most common type of traumatic intracranial hemorrhage **(Rao et al., 2016).**

Acute subdural hematoma commonly follows an evident head injury, it is more common in younger people and is likely to need surgical evacuation. In contrast, chronic subdural hematoma is often seen in the elderly, especially in those with some degree of brain atrophy **(Cheshire et al., 2018**).

A subarachnoid hemorrhage (SAH) is bleeding between the arachnoid and pia membranes covering the brain. The main cause is head trauma, however non-traumatic cause, such as those caused by cerebral aneurysm may occur **(Toth and Cerejo, 2018**).Intracerebral hematomas are commonly occurring both at the site of direct trauma and at the counter-coup site, also they can be caused by bruising of the brain (a cerebral contusion). They are common after a severe head injury. The mass effect of any of these bleeds may lead to cerebral herniation (**Greenberg, 2001**).

People may develop drowsiness, confusion, paralysis on the side of the body opposite the hematoma, speech or language impairment, or other symptoms, depending on the location of the brain damage.

Skull fractures can be classified into simple, depressed and basal skull fractures. The latter are difficult to see on skull X-rays but are associated with physical signs such as periorbital bruising or Battle's sign **(Oehmichen et al., 2006)**. These may also be associated with cranial nerve damage, especially facial and auditory nerves. Basal fractures also cause bleeding into the middle ear, seen as either blood behind the ear drum or coming from the external ear, or rhinorrhea, basal and compound fractures can produce a dural leak, which provides a potential route of C.N.S infection (**Solai et al ., 2018)** .

Most of patients with moderate and severe TBI are intubated, anaesthetized, and sedated.So, using of clinical evaluation for detection of severity of intracranial injury as the GCS become less reliable (**Teasdale et al., 2015**). Thus, the use of CT scanning is mandatory, also it can provide information on prediction of outcome (**Kolias et al., 2013**).

The study was carried out to investigate cases of traumatic head injuries referred to Neurosurgery Department of South Valley University Hospital over the period starting from September 2019 till September 2020 to evaluate the outcome and medico legal aspect following head injury, to reduce complications, and improve clinical equipment utilization and quality of care for head trauma patients.

Patients and Methods

One-year period prospective descriptive epidemiological study of cases with moderate and severe head injuries. This study was conducted on 200 patients selected from all cases admitted to the Emergency department, South Valley University Hospital during the period from septmper2019 to September2020 and the selection was according to the inclusion criteria.

The data collection sheet included personal data (age, sex, and residency), incident related data (cause, manner, and time of injury) and, both clinical and radiological findings.

⇒ **Patients:**

1. Inclusion criteria:

- Age: 18-70 years.
- Sex: both**.**
- Patients with moderate and severe head injuries

2. Exclusion criteria:

- Age: below 18 years, above: 70years.
- History of liver, kidney and heart diseases

⇒ ***Methodology**:*

1. History was taken from the patients to determine the etiology, the time and the manner of head injury, drugs intake. History of diabetes or hypertension, and if there was previous head injury.
2. Clinical examination for detection of neurological deficits and the Glasgow Coma Scale.GCS was measured in every patient at time of admission to detect the degree of severity, either moderate (GCS = 9–13), or severe (GCS = 3–8).
3. Using CT-scan on the head to detect the type of head injury, with comparison of CT positivity with the patient's demographics and clinical characteristics was carried out using Chi-square.
4. Finally, evaluation for detection the outcome, regarding to good recovery, moderate disability, severe disability, vegetative state or death.
5. Types of treatment plan either surgical or conservative.

Statistical analysis

Results were expressed as frequency and percent for categorical variables and mean ± SD for continuous variables. Chi-square test ($\chi 2$) was used for comparing proportions between the different etiological causes of head injuries regarding age and gender. p value< 0.05 was considered statistically significant.

Ethical Considerations

The current study has been approved by the Ethics Committee of Faculty of Medicine, South Valley University, Qena, Egypt.

- An official letter was taken to approach the director of Neurosurgery department in SVU hospital for permission to conduct the study.
- Security of data base.

Results

The hospital-based study included all moderate and severe head injuries (200cases) that attended the Trauma Unit of South Valley University Hospitals, Qena, Egypt, between1st September 2019and 1st September2020.

Table (1):showed the socio-demographic characteristics of the studied population, the incidence of moderate and severe head injuries among the age group 18-39 years was(28%)of the cases , the highest percentage was in the age group 40–59years (54%) ,while the lowest percentage was in the age group 60-70years.As regard sex of cases male percentage was (76%)and females represented (24%) of the cases. About the residence 30% of the cases belonged to the urban area while 70% were from rural areas. Regarding chronic disease ,it was found that 50% of the cases did not have diabetes mellitus (DM) or hypertension (HTN) while 4% of the cases had DM,11% of the cases had HTN and35% of the cases had both DM and HTN. As regard drug intake, it was found that that 56%of the cases took drugs and 44% did not take drugs. As regard previous head injury , it was found that 82% of the cases did not have a previous head injury, and 18% had a previous head injury.

Table (2): showed the medico-legal criteria of head injury , it revealed that falls (fall from height) were the main etiology of injuries (44%), followed by road traffic accidents (34%) and violent assaults (22%). Accidental manner of injury was the commonest in more than half of the cases (64%) followed by the homicidal manner (22%) and suicidal manner (14%) of the cases. As regard the causative instruments, it was found that blunt instruments were the commonest (94%) followed by sharp instruments (6%). About the sites of head injury (right and left temporoparietal) sites were the commonest ones (43%), followed by frontal (25%), occipital site (20%), and lastly combined sites (12%) of the cases.

Table (3): The clinical profile of the studied group with moderate to severe head injuries was as follows: Time passed from injury to admission was found to be more than 4hours in34% of the cases, while 1-4 hours in62% of the cases, and less than one hour in only 4% of the cases. Regarding to signs of lateralization, it was found that about76%of the cases had signs of lateralization while 24% of the cases did not have signs of lateralization. As regard associated injuries, about 58% of the cases presented with associated injuries (limb fracture, internal organ hemorrhage, chest trauma and multiple fractures) while42% with isolated head injuries. As regard GCS, it was found that (58%) of the cases had moderate head injuries (GCS 9:13), and (42%) of the cases had severe head injuries (GCS less than 8).

CT findings revealed that intracranial hemorrhages were the most common findings (subdural hematoma 40% followed by subarachnoid hemorrhage 30% then extradural hematoma 26%, and intraventricular hemorrhage4%). About brain injury, it was found that (brain edema 25% and brain contusion 38%) of the cases, As regard skull fractures,it was found that fissure fracture was the commonest one 70%of cases. Treatment of these cases was conservative in 36% of the cases, surgical in56%, while conservative followed by surgical in8%of cases. The outcomes of the cases were improvement in 46%, while 14% had disabilities, 10% with vegetative state, and30% of the cases died head injuries.

Table 1. Socio demographics criteria of cases with moderate and severe head injuries.

Variable		Frequency (200 cases)
AGE		42.9±16.9
	18-39yrs.	56 (28%)
	40-59yrs	108 (54%)
	60-70yrs	36 (18%)
Sex	Male	152 (76%)
	Female	48 (24%)
Residence	Rural	140 (70%)
	Urban	60 (30%)
chronic diseases	No	100 (50%)
	DM	8 (4%)
	Hypertension	22 (11%)
	DM, Hypertension	70 (35%)
Drug intake	No	88 (44%)
	Yes	112 (56%)
Previous head injury	No	164 (82%)
	Yes	36 (18%)

DM=diabetes mellitus

Table 2. Medico-legal criteria of cases with moderate and severe head injuries.(N=200cases)

Causes of injury.	Assaults	44 (22%)
	Falls	88 (44%)
	Road traffic accident	68 (34%)
	Firearm injuries	-
Manner of injury	Accidental	128 (64%)
	Homicidal	44 (22%)
	Suicidal	28 (14%)
Instrument		
• Blunt		188 (94%)
• Sharp		12 (6%)
• Firearm		-
Site of injury		
• Occipital		40 (20%)
• Frontal		50 (25%)
• Right Temporoparietal		44 (22%)
• Left Temporoparietal.		42 (21%)
• Combined sites		24 (12%)

There was no statistically significant difference between the etiology of moderate to severe head injury and gender of cases (p value < 0.3).

As regard the residence of the cases, there was no statistically significant difference between the etiology of moderate to severe head injury and residence of cases (p value < 0.07).

There was a statistically significant difference between the etiology of moderate to severe head injuries and time passed from injury to admission. (p value < 0.002); In road traffic injuries , the time passed from injury to admission usually was 1-4hrs in (70.6%)of cases ,While it was >4hrs in29.4% .

Table 4. Correlation between the Etiology of moderate to severe head injuries and the manner of injury in the studied cases.

manner		injury cause			
		Assaults (44case)	Fall from height. (88cases)	Road traffic (68cases)	P value
accidental	Count	0	60	68	.000*
	% within injury _cause	0.0%	68.2%	100.0%	
homicidal	Count	44	0	0	
	% within injury _cause	100.0%	0.0%	0.0%	
suicidal	Count	0	28	0	
	% within injury cause	0.0%	31.8%	0.0%	

Also, in fall from height, the time from injury to admission in usually was 1-4hrs (77.3%) ,On the other hand ,it was >4hrs and <1hr in 13.6% and9.1%of cases , respectively. In assaults it usually was>4hrs in(81.8%)of cases. While it was 1-4hrs in 18.2% of cases.

Table (4): There was a statistically significant difference between the etiology of moderate to severe head injury and manner of injury. (p value < 0.000); In road traffic injuries associated with accidental manner only . while in fall from height mostly associated with accidental manner (68.2%) compared to suicidal manner (31.8%) of the cases; In assaults associated with homicidal manner only.

Table 3. Clinical criteria of moderate and severe head injuries in studied cases.

Variable			Frequency (200cases)
	4 hours		68 (34%)
	1-4 hours		124 (62%)
	<1 hour		8 (4%)
GCS	moderate (GCS9-13)		116 (58%)
	severe (GCS<8)		84 (42%)
Signs of lateralization	Without		152 (76%)
	With		48 (24%)
Associated injury	no		84 (42%)
	yes		116 (58%)
Ct scan on the head	Skull fractures	Fissure fracture	140 (70%)
		Depressed fracture	32 (16%)
		Comminuted fracture	28 (14%)
	Intracranial hemorrhage	Extra dural hematoma	52 (26%)
		Subdural hematoma	80 (40%)
		Subarchnoid hemorrhage	60 (30%)
		Inter ventricular haemorrhage	8 (4%)
	Brain injury	Brain contusion	76 (38%)
		Brain edema	50 (25%)
		Brain laceration	44 (22%)
Line of treatment	conservative		72 (36%)
	surgical		112 (56%)
	Conservative and surgical		16 (8%)
outcomes		death	60 (30%)
		vegetative	20 (10%)
		disability	28 (14%)
		recovery	92 (46%)

Table 5: There was a statistically significant difference between the etiology of moderate to severe head injury and GCS(p value < 0.009); In violent assaults were mostly responsible for sever injuries (with GCS <8) 81.8%compared to moderate injuries(GCS 9-13)18.2%,While in falls from height were mostly responsible for moderate injuries (72.7%)compared to severe injuries (27.3%).On the other hand , road traffic injuries were mostly responsible for moderate injuries (64.7%)compared to severe injuries (35.3%) of the cases.

Table 5. Correlation between the etiology of moderate to severe head injuries and GCS in the studied cases

GCS			Violent assaults (44 cases)	Fall from height (88 cases)	road traffic injuries (68 cases)	P value P
	severe	number	36	24	24	.009*
		% within injury cause	81.8%	27.3%	35.3%	
	moderate	number	8	64	44	
		% within injury cause	18.2%	72.7%	64.7%	

Table 6. Correlation between fissure fracture and the etiology of moderate to severe head injuries in the studied cases

Fissure fracture_ff			Assaults (44cases)	Fall from height/on the ground. (88cases)	road traffic injuries (68cases)	P value
	yes	number	36	44	60	.02*
		% within injury cause	90.9%	50%	88.3%	
	no	number	8	44	8	
		% within injury cause	9.1%	50%	11.7%	

Table 7. Correlation between the etiology of moderate to severe head injuries and intracranial hemorrhage in the studied cases

			Assaults 44case	Falls 88cases	Road traffic injuries(68cases)	P value
Extradural hematoma	NO	number	20	72	56	.05*
		% within injury cause	45.5 %	81.8 %	82.4%	
	YES	number	24	16	12	
		% within injury cause	54.5 %	18.2 %	17.6%	
Subdural hematoma	yes	number	8	60	12	.000 *
		% within injury cause	18.2 %	68.2 %	17.6%	
	NO	number	36	28	56	
		% within injury cause	81.8 %	31.8 %	82.4%	
Subarachnoid hemorrhage	NO	number	28	76	36	.4
		% within injury _cause	63.6 %	86.3 %	52.9%	
	YES	number	16	12	32	
		% within injury _cause	36.4 %	13.7 %	47.0%	

Table 8. Correlation between the etiology of moderate to severe head injuries and contusion in the studied cases

CONTUSION		Violent assaults (44cases)	Fall from height. (88cases)	road traffic injuries (68 cases)	P value
NO	Count	40	36	48	.01*
	% within injury cause	90.9%	40.9 %	70.6%	
YES	Count	4	52	20	
	% within injury cause	9.1%	59.1 %	29.4%	

Table 9. Correlation between the CT findings of moderate to severe head injuries and GCS in the studied cases.

GCS		Fissure fracture	BRAIN contusion	SDH	SAH	P value
severe	Count	116	50	40	50	.002
	% within injury cause	82.9 %	65.8%	60 %	83.3 %	
moderate	Count	24	26	30	10	
	% within injury cause	17.1 %	34.2%	40 %	16.7 %	

Table 10. Correlation between the etiology of moderate to severe head injuries and outcomes in the studied cases.

Outcomes		Assaults (44cases)	Falls (88 case)	road traffic injuries (68 cases)	P value
Death	Count	28	24	8	.05*
	% within injury_cause	63.6%	27.3 %	11.8%	
vegetative	Count	8	4	8	
	% within injury cause	18.2%	4.5%	11.8%	
disability	Count	0	12	16	
	% within injury cause	0.0%	13.6 %	23.5%	
recovery	Count	8	48	36	
	% within injury cause	18.2%	54.6 %	52.9%	

There was no statistically significant difference between the etiology of moderate to severe head injury and depressed fracture (p value < 0.8).

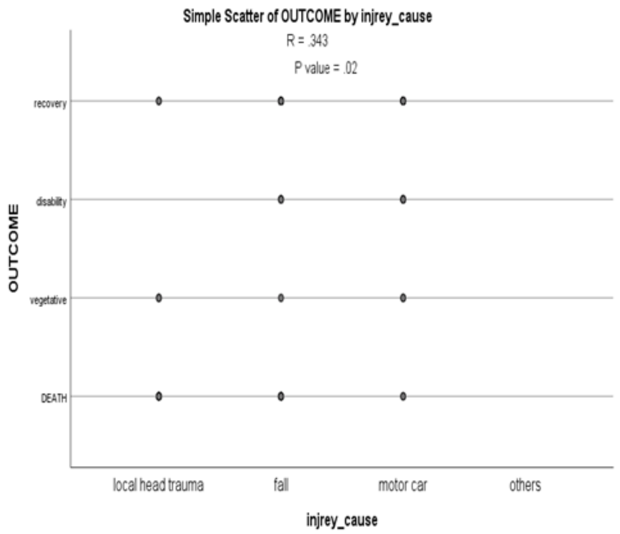

Fig.1. Correlation between outcomes and the cause of injury.

Table 7:Showed the correlation between the etiology of moderate to severe head injuries and the intracranial hemorrhage in the studied cases .It was found that, there was a statistically significant difference between the etiology of moderate to severe head injury and extradural hemorrhage .(p value < 0.05);In assaults mostly associated with EDH 54.5%in compared to 45.5% not associated with EDH, In Fall from height were usually not associated with EDH(81.8%)in compared to 18.2% associated with EDH .In road traffic injuries mostly not associated with EDH(82.4%)in compared to(17.6%) were associated with EDH.

There was a statistically significant difference between the etiology of moderate to severe head injury and subdural hematoma (SDH). (p value < 0.000); In assaults associated with SDH (18.2 %) in compared to 81.8% not associated with SDH. In falls 68.2% of cases were associated with SDH while 31.8% not associated with SDH. While in road traffic injuries mostly associated with SDH (17.6%) in compared to (82.4%) not associated with SDH.

There was no statistically significant difference between the etiology of moderate to severe head injury and subarachnoid hemorrhage (p value < 0.4).

Table 8:;There was a statistically significant difference between the etiology of moderate to severe head injury and brain contusion .(p value < 0.01);In assaults mostly not associated with brain contusion 90.9% in compared to 9.1% associated with brain contusion, In fall from height were usually associated with brain contusion 59.1%in compared to 40.9% not associated with brain contusion .In road traffic injuries mostly not associated with brain contusion 70.6% in compared to 29.4% were associated with brain contusion.

Table 9 : There was a statistically significant difference between the CT findings of moderate to severe head injury and GCS (p value < 0.002); Fissure fractures were mostly associated with severe injuries (82.9%) compared with moderate injuries (17.1%). Brain contusion was mostly associated with severe injuries (65.8%) compared to moderate injuries (34.2%), while subdural and subarachnoid hemorrhage were mostly associated with severe injuries (60%) and (83.3) respectively. Compared to moderate injuries (40%) and (16.7%) respectively.

Table (10) & Fig.1: There was a statistically significant difference between the etiology of moderate to severe head injury and outcomes of the cases. (p value < 0.05); In road traffic injuries, their outcomes usually were recovery (52.9%), as compared to 23.5% had disability, and equal percentages were died and in vegetative state (11.8%) of the cases, respectively. In assaults, the mortality rate was (63.6%), compared to an equal percentage were in vegetative state and recovered (18.2%) of the cases, while there were no disabilities .In falls from height, their outcomes usually were recovery (54.6%), compared to 27.3% died ,while 13.6% had disability and4.5% were in vegetative state of the cases, respectively.

There was no statistically significant difference between the etiology of moderate to severe head injuries and signs of lateralization of cases (p value < 0.06)

Fig. 2; There was positive significant correlation between outcomes and the time passed from injury to admission R=.323 P.Value<.02.

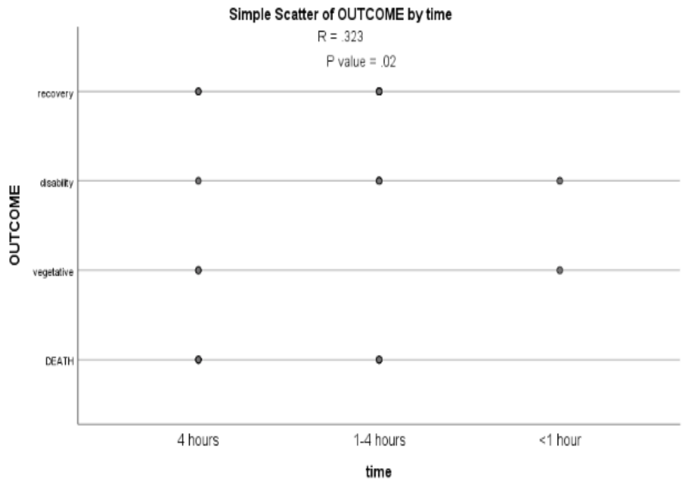

Fig.2. Correlation between outcomes and the time from injury to admission.

Table (11)& Fig.3: There was positive significant correlation between outcomes and GCS.R=.621P.Value<.000 . In severe head injuries, the mortality rate was (47.6%), compared to (4.8%) recovered,while the percent in disabilities and vegetative state was equal (23.8%) of the cases, respectively. In moderate head injuries, the mortality rate was (17.2%), compared to (75.9%) recovered and (6.9%) with disabilities, while there were no cases in vegetative state.

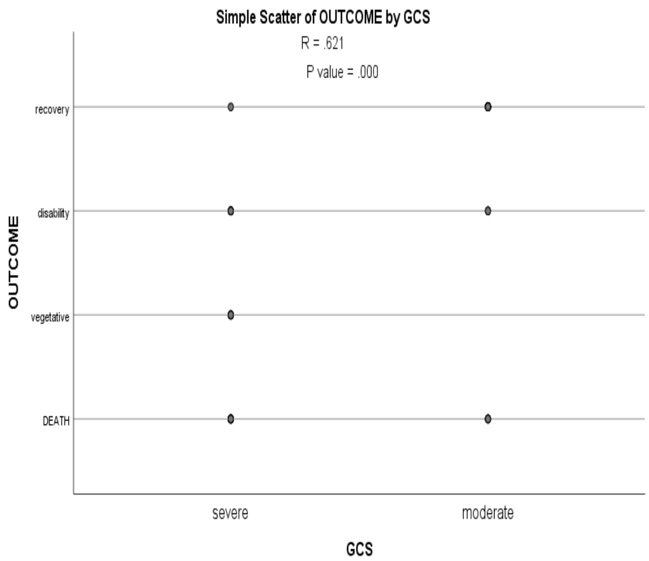

Fig.3.Correlation between outcomes and GCS.

Table11. Correlation between outcomes and GCS.

OUTCOME			GCS		
			severe	moderate	P value
	DEATH	Count	40	20	.000*
		% within GCS	47.6%	17.2%	
	vegetative	Count	20	0	
		% within GCS	23.8%	0.0%	
	disability	Count	20	8	
		% within GCS	23.8%	6.9%	
	recovery	Count	4	88	
		% within GCS	4.8%	75.9%	
Total		Count	84	116	
		% within GCS	100.0%	100.0%	

Discussion

The study included 200 cases of moderate and severe traumatic brain injury admitted to the Neurosurgical Trauma Unit in South Valley University Hospital, Qena, Egypt. In the present study, the most affected age group was middle age (54%) followed by adolescents 28%, in accordance with the present study, the research of **Maegele et al., (2019)** in Germany, who found that the highest incidence of head injuries among the 44 and 60 years old.

Also, the present study was in accordance with the study in India which discovered that the most susceptible age groups are those of the third decade 48.13%, followed by the fourth decade 24.06%, as these age groups are working age groups, so most susceptible to road traffic accident and workplace accidents, while children are confined to the surroundings near the home **(Gupta, 2002).**This finding is in controversy with a research carried out by **Halldorsson et al**. **(2007)** who conducted a prospective study on traumatic head injuries in Iceland and documented that an increased risk for traumatic head injury in the age group from (0-4 year).

The current study revealed that, males were prevalent constituting gender (76%). These findings agreed with, **Yadav et al. (2008)** who found that gender distribution of the victims of traumatic head injuries showed a male predominance (82.4%). These results also agreed with a research conducted by **Taha and Barakat (2016)** and study performed by **Hassan et al. (2017).** The predominance of male explained by the fact that males are more exposed to the outer world than females **(Hemalatha and Singh, 2013).**

Young men are also more likely to engage in fights involving weapons and firearms, engage in high-risk or contact sports such as football, karate, boxing, etc., and are much more likely to be employed in occupations with some form of industrial risk, often involving heavy equipment **(Gupta, 2002 ; Yadav et al., 2008).**

The present work showed higher rates of TBIs in rural areas (70%) than in urban areas (30%). This was in consistence with the findings of **Gabella**who used a state surveillance system to identify cases of TBI for the year 1991 and 1992. This study showed higher rates of sever traumatic brain injury in rural as compared to urban areas **(Gabella et al., 1999).**

In the current study, blunt trauma injuries were the most frequent (57.3%). These findings agreed with results of **Mohanty et al. (2005)** in India who found that blunt trauma was the most common constituting type while the least common type was firearm trauma. The reason for the common use of blunt weapon that they are inexpensive, readily accessible and can be claimed to be household instruments when found later.

In the current study, accidental infliction was the most common manner of infliction (64%), while suicidal injury was the least. In the same line with the present study, the results of **Yadav et al. (2008**) in India, who found that there were 92.4% victims of accidents, 6.7% of homicides and just 0.9% were suicide.

Also, **Patil and Vaz, (2011)** stated that accidental manner was the most common manner in cases of head trauma, and this was in concordance with the present study.

In the present research, falls were the most prevalent cause of head injuries while the least prevalent incidence in assaults injuries. These findings were in agreement with **Linnau, (2012)** who stated that fall from height (31.5%) was the most prevalent cause of head injuries, in the United States, followed by motor vehicle collision and assaults.

In conversely with the present study, the findings of **Pate et al. (2017)** survey in India and **Chelly et al. (2017)** in Malaysia who discovered that the most prevalent cause of head injury was road traffic accident RTA.

The authors stated that there was positive significant correlation between cause of injury and the outcomes.

As regards the most liable site for head trauma, the present results declared that temporoparietal areas were the most frequent sites. Our results were parallel to results of **Hardman and Manoukian, (2002**) in North America. These findings could be explained by that head areas are targets for homicidal and multiple violence attacks and because vault fractures are more common than basal fractures as it is more exposed (**Hardman and Manoukian , 2002; Rupani et al., 2013**). Meanwhile, a study done by **Consunji et al. (2013)** in Philippines stated that maxillo-facial were the most common injuries recorded in a young adult male as they did not wear a motorcycle helmet and was likely to have driven under the influence of alcohol.

In the present study, most cases received conservative treatment; these results were in concordance with research done by **Patil and Vaz, (2011**) in India.

Regarding with CT scan, with concerning skull fractures at CT findings, the present study results declared that the most common type of skull fractures was simple fissure followed by depressed fracture. These findings agreed with the outcomes of **Menku et al. (2004)**who reported that fissure fractures were by far the most prevalent form of fractures, and this was parallel to studies done by **Mohanty et al. (2005**) and **Pate et al. (2017).**

The Glasgow Coma Scale (GCS) score, after its introduction in 1974, has been frequently used as one of the most important predictors of outcome after head injury. In the present study, based on GCS scores, TBIs were severe in 42%, moderate in 58%, In another study (**Leitgeb J. , 2013),** the following pattern was observed: 57% had mild TBI,while about 28 % had moderate, and 15% had severe TBI at admission. The author stated that a low GCS score is more likely to produce unfavorable outcomes.

In this study, the commonest type of intracranial hemorrhage was subdural. These results were in concordance with **Bullock et al. (2006)** and **Maas et al. (2008)** who stated that the highest incidence of subdural hemorrhage, However, **Chattopadhyay and Tripathi (2010)**, who stated that the most frequent was epidural hemorrhage, these contradictory results might be due to the different types of accidents that cause prominence of other types than subdural hemorrhages.

With concerning outcome of head trauma, the present study revealed that the majority of patients recovered completely (46%). which agreed with the study done in Karachi, Pakistan by **Umerani et al. (2014)** who showed that cases with complete recovery after head injury was (63%) while (4.5%) mortality rate only. The present findings disagreed with results **of Ramsay and Shkrum, (2005)** who found that the most prevalent incidences of continuous disability was(47.3%).

Overall mortality observed in our study was 30%, while it was 21% in **Wijdicks et al. (2005)** study, while 7.8% in **Sadaka et al. (2012)** study, and 10% in **Büyükcam et al. (2012)** study. The higher mortality in the present study may be due to the high percent of chronic diseases in the studied cases, and the categories of studied cases belong to moderate and severe head injury only.

Conclusion

The total number of selected traumatic head injuries cases was 200 cases; Severe TBI has a higher mortality and morbidity than moderate TBI.

It has a high impact on middle age people, especially men. Accidental infliction was the most common manner, the most common cause of TBI was falls from high followed by road traffic accident,the peak incidence of TBI was in rural. The most affected sites were temporo-parietal sites.

Most cases received conservative treatment; large number of the cases had full recovery. The time passed from injury to admission of the patient, GCS at admission and the CT scanning are significant predictors of outcome.

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