Journal of Rawalpindi Medical College (JRMC); 2018;22(2): 120-123

Original Article

Pattern of Head Injury and Associated Injuries in the Patients Presenting to Neurosurgical Emergency

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Abstract

Background: To assess the pattern of head injury and associated injuries along with head injury presenting to neurosurgical emergency after sustaining injuries by different modes.

Methods: In this observational study, non-probability consecutive sampling was used. Patients were recruited who were having head injury with or without any associated bodily injury. There was no compulsion for age and gender

Results :Majority of the patients were male (81.28%) with 48% aged between 20-49 years. Road traffic accident (66.89%) was the commonest mode of injury. Associated injuries were found in 39.7%. Maxillo-facial injury (17.3%), long bone injury (17.8%) and spinal trauma (5.8%) were the commonest associated injuries.Normal brain CT scan was seen in 28.6%

Conclusion: Head injury is frequently associated with injuries to other parts of body .That is why other bodily injuries should be taken into consideration while dealing with head injury.

Key Words: Head injury, Associated Injuries, Neurosurgical Emergency

Introduction

Five million people around the world die each year because of injuries which are preventable.[1,2] Ages between 15 and 44 are the most vulnerable group.[3] Brain injury accounts for majority of deaths, I.e. 50%. Heart or aortic injury causes 17% of deaths, hemorrhage causes 12%, sepsis 10%, lung injury 6%, burn 3%, and liver injury causes remainder 2% of the mortalities.[4] Head injury is disruption in brain functions due to external force which is responsible for morbidity and mortality.[5] It is classified into three major classes.[6] In mild head injury GCS is 13-15, in moderate head injury GCS is 9-12, in severe head injury GCS is 3-8.[7] For assessing prognosis and severity of head injury Glasgow coma scale is a quick tool.[8-11] By the year of 2020, it is estimated that head injury may be the third most common cause of death and disability.[12]

There are many mechanisms of injuries like road traffic accident, falls from height, assault. Among these mechanisms road traffic accidents is one of the top five causes of death in South Asia. [13,14] In Iran 30,721 people died in road traffic accidents in 2005.[15] While in India nearly 80,000 died each year and 340,000 are injured every year.[16] In India one accident is reported after one minute and one death after eight minutes.[16] In China 13.5% out of all casualties occur due to road accidents. Falls are the second cause of unintentional injury throughout world and are increasing in frequency given aging population.[17] Main cause of head injury in children is fall from height.[18] Haug et al reported that 17.5% of facial fracture patients had closed head injury in one form or the other. [19,20] The combination of head and abdominal injuries is usually rare, because the abdomen is relatively far from the head compared to other regions, and less vulnerable to get injured.[21,22]

Patients and Methods

This prospective observational study was conducted at Department of Neurosurgery, DHQ Hospital, Rawalpindi Medical University, Rawalpindi, from December 2017 to February 2018. Sample size was 577 patients. The sample was calculated by non probability consecutive sampling. Patients who were having head injury with or without other associated injuries of body were included in the study .Patients who were recruited had no compulsion of any age group or gender. Patients were included regardless of their mode of injury. Study Performa was prepared, which included all variables i.e. age, gender, mode of injury, associated injuries, intracranial pathology, outcome. The Performa was filled by on duty doctor. The data was analyzed in SPSS version 23 and results were presented.

Results

Out of 577 patients majority (81.28%);n= 469) were males and 18.72 % (n= 108) were females. Young and

Table 1.Relationship between mode of injury and mortality

Mode of injury	Total	Discharged	Expired
Fall from height	173	158	15
RTAs	386	292	94
Assaults	18	15	3
Total	577	465	112

Table 2.Relationship between mode of injury and associated injury

Mode of injury	Abdom-ino-pelvic trauma	Long bone trauma	Chest trauma	Spine trauma	Maxillo-facial auma	Long bone + maxillofacial trauma	Spine +chest trauma	Long bone+ spine trauma
Fall from height	6	8	0	3	6	0	0	3
RTAs	9	60	12	18	66	25	3	7
Assaults	0	0	0	0	3	0	0	0
Total	15	68	12	21	75	25	3	10

Long bone fractures accounted for 17.9% (n=103), spine trauma in 5.8% (n=34) of total patients, abdominopelvic trauma in 2.6 % (n=15) of patients, Chest trauma in 2.6 % (n=15) of the total patients (Table 2). CT scan brain was normal in 28.6% (n=165) of patients and it showed 14.3% (n=83) Extradural hematoma, 8.1% (n=47) cranium fracture with Extradural hematoma, 10.4% (n=60) cranium fracture with pneumocephalus, 13% (n=75) brain contusions, 14.2% (n=82) with multiple findings on CT scan, subarachnoid hemorrhage 8.5% (n=49), 6.2% (n=36) Subdural hematoma, and 2.6% (n=15) Diffuse axonal injury (Table 3).

Table 3 Relationship between intracranial pathology and outcome

CT scan finding	Total	Discharged	Expired
Normal	165	145	20
Extradural hematoma	36	33	3
Subdural hematoma	36	30	6
Cranium fracture with pneumocephalus	60	54	6
Intracerebral bleed	12	6	6
Contusion	75	56	19
Diffuse axonal injury	15	4	11
Multiple	82	47	35
Subarachnoid hemorrhage	49	46	3
Extradural hematoma + cranium fracture	47	44	3
Total	577	465	112

middle aged group (20-49) years were 48 % (n=277) out of 577 victims, 15.6% (n=90) were more than 50 years age. Mean age of male patients with head injury was 28.74±17.20 while of female patients was 21.51±21.46. 66.89% (n=386) of total patients recruited were having head injury due to road traffic accidents, 30% (n=173) patients were having head injury due to falls, 3.1% (n=18) patients were having head injury due to assault as mode of injury (Table 1). 80.6% (n= 465) patients were discharged while 19.4% (n= 112) expired (Table1). 39.7%(n=229) of the total patients recruited were having some associated injury along with head injury. Maxillofacial trauma was seen in 17.3%.

Discussion

Head injury is one of the commonest cause of mortality and morbidity. Among the victims of head injury, number of males who are affected are far more than females.[1,23] Overall young and middle aged people are more prone to have head injuries because of their more exposure to outdoors, so ages between 20-49 years are more affected with head injuries i.e. 47.1% which is in accordance with other studies.[24,25] With reference to mode of injury RTA was most outstanding cause of head injury.[26] Patients of head injury due to road traffic accidents were (n= 386) 66.9 % which is very much in accordance with an Indian study. [34] Among road traffic accidents 51.6% (n=298) were bike riders. Accidents due to motor bike riders were at top and having high percentage of head injury. There are many means of transportation, among them motor bike is used mostly. This is because running cost of motorbike is cheap; one can easily access narrow alleys by using motor bikes.[26] Among the bike riders those who are wearing helmet are less vulnerable to head and neck injuries than those who are without helmet and this has been proved time and again in different studies across the globe.[27]

In our study head injury due to fall from height was 30% which is in accordance with other studies.[28,34] In some studies average percentage of patient of head injury due to falls is 20-30.[29] Most of the patients with head injury due to fall from height were children.[34] This is due to lack of attendance of children and children playing or kite flying on open roofs.

Another mode of head injury is assault. In our study only 3.1% (n=18) cases were noted. A study in India showed almost the same results[34]. There are many reasons of domestic violence in developing countries like lack of education, dispute on little things. Sharp,

blunt weapons and firearms are being used now a days. Maxillofacial injuries are associated with head injury due to assault. In most cases frontal, temporal and parietal bones are fractured.[30] Occipital bone is less vulnerable to fracture; this is because of thickness of occipital bone.[31]

There were four types of injuries associated with head injury in our study. Long bone trauma was the most frequent associated injury i.e 17.9%. In a study done in Canada there was 23.5% association of mild traumatic brain injury with long bone trauma.[35] Another study showed 28.3% incidence of long bone fracture along with traumatic brain injury.[36] This is due to the fact that mostly head injuries are amongst bikers and they are unprotected , so in case of RTA the biker falls off from the bike which may cause long bone injuries. Maxillofacial injuries are also very frequently associated with head injury . Maxillofacial injuries common in bike riders who do not wear helmet because maxillofacial bones are prominent part of face and are most likely to get injured and fractured along with head injury. In our study maxillofacial injuries accounted for 17.3% (n= 100) which is in accordance with other studies.[20,32]

Percentage of abdominal trauma is very low in comparison with other associated injuries, because abdominal viscera are protected by bony pelvis. Chest injuries are also associated with head injury that may range from simple laceration to rib fracture and to flail chest. Identification and prompt management of such injuries should be done quickly. In our study 2.6 % of the patients suffered from chest injury. In one study chest injury with head injury is reported as high as 20.2%.[37] Spinal trauma was reported in 5.9% (n=34) of the total patient. In another study 7.8% of the total head injury patients had concomitant spinal injury as well.[38] Spinal trauma is associated more with severe head injury as the impact transmission from head to spine is more and in spine trauma more common area involved is the cervical spine.[33]Out of expired patients six patients expired due to abdomino-pelvic trauma due to RTA, twenty nine patients expired due to long bone fracture

Conclusion

1.Head injury is very frequently associated with other bodily injuries, so in cases of head injury these injuries should be taken into consideration to decrease mortality and morbidity.

2.Proper helmets and safety belts should be used in order to prevent head injury and associated injuries.

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