A Profile of Fatal Head Injury in Homicidal Deaths (A Retrospective Study of 5 Years)

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Abstract

Jamnagar region, Gujarat state, enjoys a relatively low incidence of homicide in India. A retrospective review of 179 cases of homicidal death brought during the years 2000 to 2004 was conducted. Out of these 179 cases of homicide there were 64 cases of fatal head injuries with 48 male and 15 female victims. There was one case of newborn whose sex could not be determined as the part brought for post mortem examination was only the head. The ratio of male to female victims was 3.2:1. Weapon of choice was a hard, blunt and heavy object. Just over 40.63% of all cases in the region occurred in the age groups from 21- 40 years of age. Even in fatal head injury homicides, incidence of skull bone fracture was quite low. Minimum survival duration of the victim was seen in majority of the cases.

Key words: Homicide, Head Injury, Blunt Force, Jamnagar

Introduction

Head is defined as that part of the human body containing the brain, organ of sight, hearing, smell and tastes including the facial bones. Of all the regional injuries those of the head and neck are the most common and important. So, head is still the target of choice in the great majority of physical assaults. Both sharp and blunt forces are responsible in the causation of head injury. Easily available common weapons like stone, stick, sword, axe, spade, etc. are more commonly used weapons. The aim of the study is not only to establish the incidence and patterns of various forms of homicidal head injuries encountered in and around Jamnagar region but also to compare them with the works of other workers.

Method and Material

We reviewed retrospectively 179 cases of homicidal deaths brought during the year 2000 to 2004 at the Forensic Medicine and Toxicology Department, M.P. Shah Medical College,

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Jamnagar. Out of 179 cases of homicide, deaths associated with fatal head injuries were observed in 64 cases, the remaining 115 cases were excluded from the present study. We also excluded all other cases having non fatal injuries on the head. General particulars of the cases were collected from the post mortem reports, police inquest, dead body challan, police investigating officer, available history from the relatives or eye witness, etc. and in few cases from hospital indoor case papers. The significant details were grouped and tabulated for the purpose of obtaining observations. A comparison was made between the observations of available literatures and present study.

Observation

The following observations were deduced from the present study and they are summarized as follows.

Table No. 1: Age and Sex Wise Distribution of Cases

Age	Sex Of The Person			Total
	M	F	N K	(%)
0-10	4	7	1	12 (18.75)
11-20	1	1	0	2 (3.13)
21-30	22	4	0	26 (40.63)
31-40	5	2	0	7 (10.94)
41-50	9	1	0	10 (15.63)
51-60	4	0	0	4 (6.25)
61-70	3	0	0	3 (4.69)
Total	48	15	1	64 (100)

M=Male, F=Female, NK=Not Known

The maximum number of head injury cases were seen in the age group of 21-30 years, 26 cases,(40.63%), followed by age group 0-10 years,12 cases,(18.75%). Male outnumbered the female victims with a male and female ratio of 3.2:1. In one case of newborn sex of the person was not known as the body part brought for post mortem examination was only the head.(Table No.1)

Table No. 2: Cases Distribution According to Occupation

Occupation	No. Of Cases	%
Laborer	11	17.19
Farmer	18	28.13
House Dweller	5	7.81
Student	2	3.13
Driver	2	3.13
Business	5	7.81
Not Applicable	11	17.19
Not Known	10	15.63
Total	64	100

So obviously farmers were most commonly involved with a total number of 18 cases, (28.13%) which was followed by laborers with a total number of 11 cases, (17.19%).'Not applicable' group means newborn and children bellow 10 years. (Table No.2)

Table No. 3: Cases Distribution According to Type of Force

Type Of Force	Sex Of The Person			Total
	M	F	NK	(%)
Sharp	5	2	0	7 (10.94)
Blunt	33	11	1	45 (70.31)
Sharp& Blunt	9	2	0	11 (17.19)
Fire arm	1	0	0	1 (1.56)
Total	48	15	1	64 (100)

The commonest method or weapon used was blunt in nature, 45 cases,(70.31 %). It was followed by use of sharp and blunt weapons, 11 cases,(17.19%). Whether sharp or blunt majority of the injuries were seen in cases of male victims, 48 cases,(75%). Fire arm was seen only in 1 case,(1.56%).(Table No.3)

Table No. 4: Number of Blunt Surface Injuries

Surface Injury	Area Of Head		Total (%)
	Scalp	Face	
Abrasion	**0**	**17**	**17 (13.18)**
Contusion	**32**	**5**	**37 (28.68)**
CLW	**42**	**33**	**75 (58.14)**
Total	**74**	**55**	**129 (100)**

Table No. 5: Number of Sharp Surface Injuries

Surface Injury	Area Of Head		Total (%)
	Scalp	Face	
Cut/Chop/Incise	51	26	77(95.06)
Single Edged	0	2	2 (2.47)
Double Edged	0	2	2 (2.47)
Total	51	30	81 (100)

Table No. 6: Distribution According to Number of Injuries

No. Of Injury	Sex Of The Person			Total (%)
	M	F	NK	
1	13	5	0	18
2	19	3	1	23
3	7	4	0	11
4	2	1	0	3
5	0	1	0	1
6-10	4	1	0	5
11-15	1	0	0	1
16-20	0	0	0	0
Crush	2	0	0	2
Total	48	15	1	64

Amongst the different blunt surface injuries born by the head, contused lacerated wounds (CLW) were the most common type with 75 injuries,(58.14%). Contusions were the second most common type with 37 injuries,(28.68%).(Table No. 4). In 2 cases,(3.13%) there were crushing of head (it is not shown in the Table).

Table No. 7: Cases Distribution According to Skull Bone Fracture

No. Of Fracture	Sex of Person			Total (%)
	M	F	NK	
Linear Fracture	8	2	0	10 (15.63)
Depressed Fracture	4	2	0	6 (9.38)
Cut Fracture	8	3	0	11 (17.19)
Comminuted Fracture	2	1	0	3 (4.69)
Multiple Fractures	10	0	0	10 (15.63)
Base Fracture	3	0	0	3 (4.69)
Crush	2	0	0	2 (3.13)
Without Fracture	10	8	1	19 (29.69)
Total	47	16	1	64 (100)

Table No. 8: Pattern of Intracranial Hemorrhage

Intracranial hemorrhages	No. Of Cases	%
Extradural hemorrhage	7	10.93
Subdural hemorrhage	21	32.81
Subarachnoid hemorrhage	32	50
Intra cerebral hemorrhage	2	3.13
Mid brain hemorrhage	1	1.56
Hemorrhage in medulla	1	1.56
Total	64	100

Commonly scalp and face injuries were cuts, incised or chop wounds, 77 injuries,(95.06%). There was not a single stab injury on the scalp area. (Table No. 5).In 1 case of a male victim we found 1 fire arm injury on right side of the head just below the right parietal eminence (it is not shown in the Table).

Table No. 9: Cases Distribution According to Brain Matter Injury

Injury Type	No. Of Cases	%
Cut	3	50.00
Laceration	1	16.67
Crush	2	33.33
Total	6	100

Table No. 10: Pattern of Major Body Cavity Involvement

Body Cavity	No. Of Cases	%
Cranium	52	81.25
Cranium & Thorax	3	4.69
Cranium & Abdomen	4	6.25
All Three Cavities	5	7.81
Total	64	100

Table No. 11: Combination With Other Fatal Weapons or Means

Combination With	No. Of Cases	%
Stabs	8	61.54
Ligature Strangulation	4	6.25
Other Blunt Trauma	1	7.70
Total	13	100

In majority of the victims number of injuries was 1 to 2. In only two cases we observed crush type of head injuries of the head.(Table No.6).

In as many as 19 cases, (29.69 %), there was no skull bone fracture. Commonly encountered skull fractures were cut fracture, 11 cases, (17.19 %); linear fracture, 10 cases, (15.63%); and multiple types of fractures,10 cases, (15.63 %). Least common type of skull fracture was crush type, 2 cases, (3.13 %). (Table No. 7).

Subarachnoid hemorrhage was the most common type of intracranial hemorrhage encountered in head injuries, seen in 32cases, (50.00 %). It was followed by subdural type of hemorrhage, 21cases, (32.81 %). (Table No.8).

Incidence of brain matter involvement was very low, 6 cases,(9.38%). They were 1 case, (16.67 %) of laceration, 2 cases, (33.33%) of crush and 3 cases,(50.00%) of cuts.(Table No.9).

Table No. 12: Cases Distribution According to Survival Period

Time Period	No. Of Cases	%
Spot Death	52	81.25
Brought Dead	4	6.25
≤ 12 hrs	5	7.81
≤ 24 hrs	0	0
≤ 48 hrs	3	4.69
Total	64	100

Involvement of only cranial cavity was seen in majority of the fatal head injury cases, 52 cases, (81.25%). Only in 5 cases there was involvement of all the three major body cavities. (Table No. 10).

In 8 cases, (61.54%) fatal head injuries were associated with stab injuries on other body parts. One victim showed fatal blunt injuries on other parts of the body too. (Table No. 11).
Most of the victims died on the spot, 52 cases, (81.25%). It was followed by less than 12 hrs and brought dead cases respectively. (Table No. 12).

Discussion

In the present study, fatal head injury was quite common with an incidence of 12 cases per year. This method constituted about 35.75% of all homicide cases recorded during the present study period. It is true that fatal blunt force injuries inflicted with intention to kill a person will be on the head. Moreover, of all regional injuries those of the head and neck are the most common and important.

Avis[1] rightly pointed out intracranial pathology to be the main lethal injury when blunt weapons are used. Dikshit *et.al* [2] and Mohanty *et.al*[3] also observed involvement of head in the majority of the cases of homicides due to blunt forces. This is consistent with the present study.

It was observed that maximum victims were males, 48 cases,(75%). The male predominance may be explained by the fact that male by nature indulge in more violent activities as compared to the females. Moreover, males are more active in various day to day outdoor activities and other social activities and customs. Male dominance was also seen by Mohanty *et.al*[3].

The maximum victims were in the age group of 21-30 years. It is also consistent with the works done by Dikshit *et.al*[2], Mohanty *et.al*[3], Murthy *et.al*[4] and Sinha *et.al*[5]. By nature this age group is more active, violent, arrogant and more vulnerable to the fast changing social trends and culture as they are mentally a bit immature with little experiences of life. It was followed by the number of victims falling in the age group of 0-10 years with 12 cases, (18.75%). Data obtained from a series of our studies on homicides show that married females are more likely to be killed by burns whereas younger females under the age of 10 years are more prone to other methods like asphyxia or burns.

Majority of the victims were farmers due to the fact that Jamnagar being predominantly rural with a small urban area. Rural area contributes major bulk of the population. Even in the laborers group too most of them were from rural areas who were working in the fields.

Of the various methods used, in both sexes, incidence of usage of blunt weapons was very high. Use of sharp weapons was seen only in 7 cases (10.94%). Higher choice of blunt weapons amongst many assailants was also observed by Dikshit *et.al*[2], Mohanty *et.al*[3], Sinha *et.al*[5] and Dalal *et.al*[6] during their respective studies on homicides. More popularity of blunt weapons may be due to their easy availability and handiness in use. Moreover, they give very little apprehension and frightening or warning to run or escape to the victim.

Most of the external skull injuries were contusions and contused lacerated wounds (CLWs) produced by hard and blunt weapons. It can be explained by the fact that in majority of the cases homicide was entertained by farmers by using commonly available house hold weapons like wooden stick, axe, spade, pipe, stone, etc. Modi[7] also quoted a similar observation that in India most of the scalp injuries are generally produced by blunt weapons. We did not find any abrasion over the scalp though they were commonly seen on the face. The scalp is more easily lacerated as the underlying hard bone acts as an anvil. Contusions are also quite common on the face and the scalp as they are rich in blood supply. Abrasions are very uncommon on the scalp because of the presence of thick hair and dense subcutaneous tissue. Cut, chop and incise wounds are commonly encountered sharp wounds seen on the head. In two cases there were stab wounds on the face. We did not find any case where stab injury was on the scalp. This could probably be explained by the fact that every one is quite aware that scalp area is very hard to penetrate by the knife whereas it is very easy to penetrate into the chest or abdomen with more or less equal fatality.

Only in 11 cases,(17.19%) we observed multiple injuries produced by sharp as well as blunt weapons. Though, in few instances, a sharp weapon may also cause a blunt type of injury; presence of multiple sharp and blunt injuries on a victim may be interpreted more accurately to be due to involvement of more than one assailants and use of more than one type of weapons.

In the present study, we observed only one case of fire arm injury on the head. Though Milroy *et.al* [8] reported fire arms to be the most common weapon used in homicide, they did not mention about the site of fire arm entry wounds. However, Fimate *et.al*[9] mentioned that killing by fire arm at the head to be the most commonly perpetuated method of homicide seen in 67.99%. They also come up with the explanation that method or weapons used may be quite variable according to socio economic status of the population and the political situation of the state.

Though multiple injuries are generally caused by intense and prolonged violence with or without involving multiple assailants, in majority of the fatal homicidal head injury cases we observed 1 or 2 injuries only. It is quite contrast to other mechanical injury homicides where we usually observe multiple stab injuries to the chest or abdomen or other multiple injuries at different places. It seems to be comparatively an easy job for the assailant to take life by giving 1 or 2 hard force on the head.

Incidence of skull bone fracture was very low. It is true that brain can be injured without producing any damage to the skull bone. Blunt weapons generally produce linear fractures. Chop and incised wounds were generally associated with cut fractures of the underlying bone. Crush type of fractures were very uncommon even in cases of newborns and infants. It requires not only a bigger quantum of force but also a bigger heavy weapon.

In over all subarachnoid and subdural type of hemorrhages were the most common intracranial hemorrhages seen in head injury cases. Mid brain hemorrhage and hemorrhage in the medulla were very uncommon. In very few cases there were naked eye injuries of the brain matter. Heavy sharp cutting weapons are likely to cause visible brain matter injury. Histological examination was not conducted not even in a single case though there were more chances of finding diffused or localized neuronal injuries by blunt forces. Though brain matter contusions are reported to be common in cases of fatal head injuries from road traffic accidents and fall from height, in the present study we did not come across any such case.

During the present study we also came across use of some other methods or weapons directly contributing to the fatality of the case. In as many as 8 cases it was associated with fatal stab injuries to other body parts. In 4 cases there was associated ligature strangulation. Other fatal body injury was seen in 1 case. In addition to the head injury, the assailant would prefer to use knives to ensure death of his victim. However, in 4 cases the assailants adopted ligature strangulation to doubly ensure death of the victim.

Most of the victims died on the spot. Only 3 victims survived for 48 hours. So, survival duration is usually short in homicidal head injury cases. It reflects the severity of the trauma.

Conclusion

The head is the target of choice in the great majority of assaults involving blunt trauma. In majority of the cases we found use of a hard, blunt and heavy weapon. So, if weapon is blunt and the intention is to kill, then the target of choice will be the head. Contusion and contused lacerated wounds are the main external injuries. There is not much difference between homicidal head injury and other head injury cases. However, homicidal head injury cases would exhibit less number of injuries on other body parts. Majority of the victims died on the spot.

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