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Original Research Article

Evaluation of Mechanical Injuries in Cases of Assault Registered at Tertiary Care Hospital in Central India

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Mechanical Injuries,
Assault,
Grievous,
Section 320 IPC.

Abstract

Introduction: Assault is one of the important preventable social health problems, always involving a risk of long term morbidity and mortality. It affects physical, mental and social health of an individual. This particular study was carried out to study physical effects of assault, particularly with reference to details of mechanical injuries. **Material and Methods:** A retrospective study was conducted at tertiary care hospital to evaluate mechanical injuries present in cases of assaults. Analysis of all, 319, cases of alleged assault registered at the hospital during the period from July 2016 to June 2018 was done based on type of mechanical injury, body part affected and severity as per S 320 IPC. **Results:** Out of 319 cases, contusions were present in 94 (29.47%, n=319) cases, followed by fractures in 91 (28.53%) and lacerations in 84 (26.33%) cases. Out of 319 cases, 184 (57.68%), 92 (28.84%) and 56 (17.55%) cases had injuries on head-neck-face, upper limbs and lower limbs respectively. In 162 (50.78%, n=319) cases, injuries were not grievous and 118 (36.99%, n=319) cases had grievous injuries as per S 320 IPC. **Conclusion:** The study indicates that contusion is seen in maximum number of cases. 'Head, neck and face' is the most targeted body part. The number of cases without grievous injury is more than the number of cases with grievous injury.

1. Introduction

Forensic Assault is a violent attack by one or more persons in an attempt to injure the other person or persons.¹

Section 351 IPC (Indian Penal Code) defines 'Assault' as – Whoever makes any gesture, or any preparation intending or knowing it to be likely that such gesture or preparation will cause any person present to apprehend that he who makes that gesture or preparation is about to use criminal force to that person, is said to commit assault.²

Explanation- Mere words do not amount to an assault. But the words which a person uses may give to his gestures or preparation such a meaning as may make those gestures or preparations amount to an assault.

Section 350 IPC defines 'Criminal force' as whoever intentionally uses force to any person, without that person's consent, in order to the committing of any offence, or intending by the use of such force to cause, or knowing it to be likely

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fear or annoyance to the person to whom the force is used, is said to use criminal force to that other.²

As per the definition stated by World Health Organization (WHO) violence is the intentional use of physical force or power, threatened or actual, against oneself, another person, or against the group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development, or deprivation.³ This is broad concept. Interpersonal violence is a type of violence. It is an intentional use of physical force or power by an individual or small group of individuals against another individual/s.³ It encompasses physical, mental, emotional or sexual violence. Deprivation and neglect are also part of the same. After considering all these various terminologies, we have considered the dictionary meaning of word 'Assault' in present study to include or exclude the cases. The same is used in software of the institute prepared exclusively for medico-legal work.

Assault is one of the important preventable social health problems. There is always a risk of long term morbidity and mortality in cases of assault. It adversely affects physical, mental and social health of an individual. This particular study was carried out to study physical effects of assault, particularly with reference to details of mechanical injuries.

Aim and Objectives

To study the mechanical injuries in cases of assault with respect to

- types of injuries based on causative object / force
- body part affected
- Severity- whether grievous or not based as per S 320 IPC.

2. Materials and Methods

This is a descriptive type of study, carried out under Clinical Forensic Medicine Unit (Hereafter will be labelled as CFMU) of tertiary care hospital in Central India. There were total 319 cases of assault registered during period of two years, from 01/07/16 to 30/06/18. These all 319 cases were analysed. The data was collected primarily from the software, specially designed for documentation of medico-legal cases under CFMU. In addition to this, data from 'Hospital Information System (HIS)' was considered for analysis of those 319 cases. This 'HIS' is an institutional 'Electronic Medical Record System'. Based on the data, case sheets were filled and further analysed by using Microsoft Office Excel Worksheet 2007.

Inclusion criteria:

All live cases of an alleged assault registered at the tertiary care hospital during the study period.

Exclusion criteria:

- Cases of assaults brought dead
- Assault due to any means other than mechanical force
- Victims of sexual assault.

3. Observations and results

According to the institutional data, there were total 4969 medico-legal cases registered during the period of two years. Of these 4969 cases, in 319 cases, alleged victims of assault were brought to the hospital for management purpose. It means, live cases of assault comprise of 6.42% of total medico-legal cases. These 319 cases were evaluated on the basis of type of injury, body part affected, and severity of injuries.

Total 8 types of mechanical injuries were considered for study purpose based on their features and type of causative object / force- Abrasion, contusion, laceration, fracture, incised wound, stab wound, chop wound and other (eg. Stitched wound). As no case of 'firearm injury' was registered during the study period, it is not included in analysis.

Table 1: Type of injury wise distribution of cases, n=319.

Type of injury	Cases (No.)	Percentage (%)
Abrasion	62	19.44
Contusion	94	29.47
Laceration	84	26.33
Fracture	91	28.53
Incised wound	59	18.5
Stab wound	18	5.64
Chop wound	4	1.25
Other	54	16.93

As per the analysis done based on type of injury seen among total number of cases, contusion was present in 94 (29.47%, n=319) cases, as shown in **table 1**, followed by fracture and laceration in 91 (28.53%) and 84 (26.33%) cases, respectively. Chop wound was seen in 4 (1.25%) cases.

Table 2: Body part-wise distribution of cases (n=319).

Site of injury	No. of cases	Percentage (%)
Head Neck Face	184	57.68
Upper Limbs	92	28.84
Chest	20	6.27
Abdomen	18	5.64
Back	37	11.6
Lower Limbs	56	17.55
No part	33	10.34

HNF: Head, Neck, Face; UL: Upper Limb; LL: Lower Limb

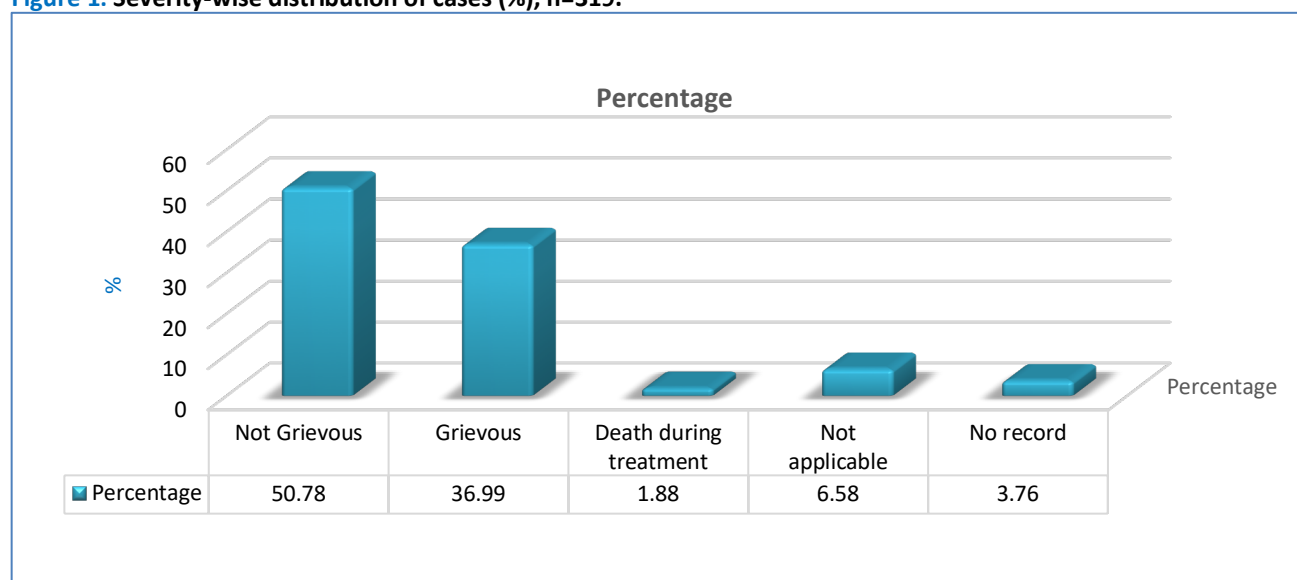
In another type of analysis, the number of cases was analysed with respect to the body parts affected as shown in [table 2](#). Head-neck-face region was affected in 184 (57.68%, n=319) cases and upper limbs in 92 (28.84%, n=319) cases. The abdomen was

affected in 18 (5.64%, n=319) cases. *Body parts are divided in 6 groups as follows- Head-neck-face (HNF), upper limbs (ULs), chest, abdomen including genitals (Abdo), back and lower limbs (LLs).

Table No. 3: Body part-wise distribution of injuries (n=851).

Body parts*	Abrasion	Contusion	Laceration	Fracture	Incised wound	Stab wound	Chop wound	Other	Grand Total
HNF	45	70	95	118	67	1	1	46	443
ULs	22	33	14	44	55	5	3	7	183
Chest	4	6	0	18	7	3	0	1	39
Abdomen	0	7	0	0	3	8	0	4	22
Back	6	18	0	2	12	5	0	6	49
LLs	17	28	13	34	10	5	0	8	115
Grand Total	94	162	122	216	154	27	4	72	851

Figure 1: Severity-wise distribution of cases (%), n=319.



Analysis of total number of injuries (n=851) with respect to body part affected was done. This analysis showed that total 443 injuries (52.56%, n=851) were present on head-neck-face region as shown in [table 3](#). Upper limbs were affected with 183 (21.50%, n=851) injuries and lower limbs with 115 (13.51%, n=851) injuries. 22 (02.59%, n=851) injuries were present on the abdomen.

As per the analysis of type of injury with respect to total number of injuries (n=851), total number of fractures observed was 216 (25.38%, n=851) as shown in Table No. 3. Contusion and incised type of injuries were 162 (19.04%, n=851) and 154 (18.10%, n=851) in number, respectively. Stab injury and chop wound were 27 (03.17%, n=851) and 4 (00.47%, n=851) in number, respectively. Other injuries were 72 (08.46%, n=851) in number which mainly included sutured wounds, where sutures are

done at some other centre. Injuries were labelled either grievous or not grievous based on S 320 IPC ^{2,4} after due consideration of injury report, clinical examination, reports of radiological investigations and medical / treatment records

Out of 319 cases, 162 cases (50.78%, n=319) had injuries which were not grievous in severity while 118 (36.99%, n=319) cases had grievous injuries, as shown in [Figure 1](#).

4. Discussion

Total number of cases considered for this study was 319 cases, registered during the study period of two years. Live cases of assault comprised of 6.42% of total medico-legal cases (n= 4969). This number differs from few other studies.^{5,6} As per the study by Thube HR et al⁵ "Out of 6870 medicolegal cases observed in casualty during the study period, maximum 37.5% were of assault cases." This study

was done in Mumbai. As per study by Haridas HV et al⁶, out of total 12,789 medico-legal cases registered during a period of one year, 3697 cases (28.90%) were of assault. However, our observation is similar with the study by Farooqui JB et al.⁷ According to Farooqui JB et al⁷, "during the study period total 878 medico-legal cases were registered out of which 90 cases were of alleged assault that accounts for 9.75%". This study was conducted based on data of one year. As per the analysis done based on type of injury seen among total number of cases as shown in table No 1, contusion was present in maximum number of cases, followed by fracture and laceration. Chop wound was seen in lowest number of cases. This can be because of easy availability of hard, blunt type of weapons.

Our observations are similar with the studies by Steen K et al⁸ and Subba SH et al.⁹

In a study by Steen K et al⁸, injuries were analysed based on specific diagnosis code system which differs from the classification of injuries used in the present study. In present study, classification of injuries used was based on nature of causative force / object.

In a study by Subba SH et al⁹, though the contusion was observed in maximum number of cases, the second most common was incised wound, seen in 25.7% cases unlike the present study wherein the incised wound was seen in 59 (18.5%) cases.

Our observation differs from studies by Niraj K et al¹⁰ and by Herbst CI et al¹¹ in which abrasion was seen in maximum number of cases. In the study by Niraj K et al¹⁰, fracture of skull and fracture / dislocation of other bones were separately considered while analysing the injuries. In the study by Herbst CI et al¹¹ cases of community assault were studied with contusion and tram-line bruises considered as two different types of injuries.

Our observation also differs from study by Thube HR et al¹² in which laceration was seen in maximum number of cases. In this study by Thube HR et al, contusion and swelling were considered separately.

When the number of cases was analysed with respect to the body parts affected as shown in table No. 2. Head-neck-face region was affected in maximum number of cases followed by upper limbs. The abdomen was affected in the least number of cases.

Our observation is consistent with the study by Subba SH et al.⁹ Studies by Niraj K et al¹⁰ and by Kokatanur CM et al¹³ differ from our observations. In a study by Niraj K et al¹⁰, upper limbs were affected in maximum number of cases followed by head-neck-

face region. In a study by Kokatanur CM et al¹³, though the face was the most frequently targeted region, second most was the chest region.

In the present study, in an analysis of total number of injuries with respect to body part affected, the head-neck-face was the most affected body part followed by upper limbs and then lower limbs. Abdomen was the least affected body part.

This is similar with the studies by Patel DJ¹⁴ and by Swarnkar M et al.¹⁵ However, in the study by Swarnkar M et al¹⁵, the second most common body region affected was trunk. In both types of analysis done on the basis of site of injury, head-neck-face region was the most frequently targeted region. This can be attributed to the fact that head-neck-face is one of the vital parts of the body and also easily accessible.

The difference with the study by Kokatanur CM et al¹³, can be due to the fact that the study by Kokatanur CM et al¹³ was based on fatal cases of assault. As per the analysis of type of injury with respect to total number of injuries, fracture was the most frequently observed injury followed by contusion and incised wound. Chop wound was the lowest in number.

Our observations differ from few studies.^{12, 13, 14} In a study by Thube HR et al¹², laceration was the most commonly observed injury followed by abrasion. In a study by Kokatanur CM et al¹³, the commonest injury observed was chop wound and contusion was the least observed injury. In a study by Patel DJ¹⁴, stab wound was the most commonly observed injury, followed by incised / chop wound. The study by Kokatanur CM et al¹³ and the study by Patel DJ¹⁴, both were done in fatal cases of assault which justifies the predominance of chop wound and stab wound, respectively. The difference in observation and predominance of injuries over head-neck-face during present study can be attributed to making use of reports of radiological investigations in present study to document skull fractures. According to S 320 IPC which defines Grievous hurt, the majority of cases in present study were not grievous in severity as shown in chart No. 1. However, 6 (01.88%, n=319) cases were not considered for severity as those cases succumbed to death while under treatment.

In 21 (06.58%, n=319) cases, the opinion regarding severity of injury was not applicable as there were no injuries present on external and internal examination. There were 12 (03.76%, n=319) cases with no opinion available about severity. This is mainly

attributed to cases which were referred to some other hospital or for patients who went on their own to some other hospital against medical advice. In such cases, where the treating doctor was not in a position to assess severity of the injury at the time of initial examination, he was also not in a position to give a final opinion about the severity due to unavailability of subsequent medical records.

There are studies^{8, 12, 15, 16} with similar observation, though the categorization or nomenclature is different. This categorization varies country to country depending on local guidelines. In a study by Johansen VA et al¹⁶, they had used 3 categories, with increasing severity- assault, inflicting bodily harm and inflicting serious bodily harm. Similarly, in the study by Steen K et al⁸, they had used the Abbreviated Injury Scale 1990 Revision (3) and Shepherd's injury severity scale to analyze the severity of injury. Sometimes the survivor & accused brought for medicolegal examination also sustained certain mechanical injuries.^{17,18} There were insightful discussions at medicolegal gatherings on such important topic.^{19,20}

5. Conclusion

Conclusions drawn from the present study are as follows:

1. Contusion was seen in maximum number of cases followed by fracture and laceration.
2. The maximum number of injuries were fractures.
3. 'Head, neck and face' region, one of the most vital body parts, was the most frequently affected body part.
4. In majority of cases, injuries were not grievous in severity, As per S 320 IPC.

Further scope:

This kind of study should be carried out at various other centres simultaneously to understand the physical impact of assault on a larger scale and thereby to take preventive steps.

Ethical Consideration: This is a retrospective study done based data available at the tertiary care hospital. No human being is involved as subject.

Conflict of Interest: None to declare.

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Contributor ship of Author: All authors equally contributed.

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