

ORIGINAL PAPER

Study of Crime Scene Investigation done in Medicolegal Cases Referred to Medical College of Metropolitan Area

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ABSTRACT

Introduction: Forensic Science plays a very significant role in the investigation system. "Crime Scene Examination" refers to an examination where forensic or scientific techniques are used to preserve and gather physical evidence of a crime. **Aims:** The main purpose of study was to collect the important trace evidences related with that particular case and also to get an opinion on issues such as time since death, manner of death, interpretation of injuries, type of weapons, physical evidences found at the scene of crime. **Methods:** In present study 50 detail crime scene investigations were carried out in relation with the autopsies conducted at JJ hospital mortuary over the period of 2 year (July 2012 to July 2014). **Results:** In this study trace evidences such as only blood stain was found in 10 (20%) cases while skin scrapings was taken in 5 (10%) cases. Fingerprints/footprints were taken in 10 (20%) cases. Combination of trace evidences were seen in 11 (22%). During study soft material was used in (26%) cases for causation of injuries. Hanging was most common (47.6%) circumstance of death in suicidal death while strangulation (47.4%) common in homicidal death. Mental illness (66.7%) was most common predisposing factor in suicidal death followed by dispute (73.7%) in homicidal death. **Conclusion:** We tried to relate the collected evidential material and observed findings with the autopsy findings and form a conclusive link between them, which was important for police investigation.

Keywords: Autopsy, Fingerprint, Trace Evidence, Weapon

INTRODUCTION

Crime is defined as an act or the commission of an act that is forbidden by a public law and that makes the offender liable to punishment by that law. The word "Investigate" means to make a systemic examination or to conduct an official inquiry.¹

In forensic science, Locard's principal holds that the perpetrator of a crime will bring something into the crime scene and leave

with something from it, and that both can be used as forensic evidence. He formulated the basic principal of forensic science. "Every contact leaves a trace." This became known as "Locard's exchange principal."² Majority of cases involves an element of assault or injury to a victim and one or more scene of occurrences/ crimes.

A fair investigation must include identification and collection of various physical evidences including biological ones and interconnecting them before presentation in the courts of law.

MATERIALS & METHODS

The present study was carried out in Department of Forensic Medicine and Toxicology GGMC Mumbai during the period of 24 months. During study in relation with 50 autopsies, the crime scene investigations were carried out, which include cases of hanging, burns, fall from height, drowning, assault, firearm. The purpose of crime scene visit was to get an opinion on issues like time since death, manner and cause of death, interpretation of injuries, probable weapon and physical evidence found at the scene of crime, consistent autopsy findings. After the completion of autopsy crime scene visit was done along with investigating officer and correlations were made between autopsy findings, spot and inquest panchanama findings with crime scene findings.

RESULTS

Age: In the present study, it has been seen that 13 (26%) of deceased found were in age group of below 18 years, 24 (48%) were in the age group of 19-40 years which was maximum, 9 (18%) deceased found were in the age group of 41-60 years and 4 (8%)

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deceased found were above 60 years of age. In our study, it was seen that male deceased were 35 (70%) in number, female were 14 (28%) in number while the sex of 1 (2%) body was not known.

Clothing: Entire clothing was seen in 32 (64%) cases, partial clothing were seen in 17 (34%) cases while clothing was absent in 1 (2%) case. Evidence of any tears, loss of buttons, bullet holes, tears, cuts, etc. on clothing by stab injuries or presence of burning, blackening, etc from firearm correspond with the injuries on the body.

Location of injury: In the present study, it was seen that in majority of cases 26 (52%) injuries were on various body parts. Neck region was involved in 11 (22%) cases. Whole body was involved in 8(16%) cases. Head and face was only involved in 2 (4%) cases.

Type of injury: It was seen in this study that combination of injuries was involved in 17 (34%) cases; abrasion was present in 13(26%) cases. Contused laceration was involved in 4 (8%) cases. Firearm injuries were also present in 4 (8%) cases. Burn injuries were present in 5(10%)cases and stab and incised injuries were involved in 7(14%) cases.

Table 1 Type of injuries

| | No of cases | Percentage |
|----------------------|-------------|------------|
| Abrasion | 13 | 26 |
| Contused laceration | 4 | 8 |
| Stab & incised wound | 7 | 14 |
| Firearm | 4 | 8 |
| Burn | 5 | 10 |
| Combination | 17 | 34 |
| Total | 50 | 100 |

Premises: It was seen that in majority of cases 29 (58%) area of premises was outdoor. In 21 (42%) cases area of premise was indoor.

Causation of injuries: It was seen that soft material was responsible for causation of injuries in 13 (26%) cases. In 12 (24%) cases weapons except firearm like knife and other weapons seen in 5 (10%) cases Injuries by hard rough surface were seen in 12 (24%) cases. In firearm 4 (8%) cases were involved. Burns injuries were seen in 5 (10%) cases.

Table 2 Manner of causation of injuries

| | No of cases | Percentage |
|-----------------------|-------------|------------|
| Soft material | 13 | 26 |
| Hard rough surface | 12 | 24 |
| Weapon except firearm | 12 | 24 |
| Firearm | 4 | 8 |
| Burn | 5 | 10 |
| Water | 4 | 8 |
| Total | 50 | 100 |

Predisposing factors: In maximum number of cases 17 (34%) dispute was predisposing factor leading to death it involves

family dispute, personal dispute, financial dispute and many more. Mental illness was a predisposing factor seen in 16 (32%) cases.

Cause of death: In the present study, it was seen that haemorrhagic shock was cause of death in 22 (44%) cases while asphyxia & neurogenic shock in 23(46%) and 5(10%) cases respectively.

Circumstances of death: Hanging was mostly seen in 10 (20%) cases followed by strangulation in 9 (18%) cases. Stab injury and accidental fall were alsosignificantly involved in 8(16%) and 7 (14%) cases respectively.

Trace evidences: Trace evidences such as only blood stain was found in 10 (20%) cases while skin scrapings was taken in 5 (10%) cases. Fingerprints/footprints were taken in 10 (20%) cases. Combination of trace evidences were seen in 11 (22%) and trace evidence was not found in 14 (28%) cases.

Table 3 Trace evidences found at crime scene

| | No of cases | Percentage |
|-----------------------|-------------|------------|
| Blood stains | 10 | 20 |
| Skin scrapings | 5 | 10 |
| Fingerprint Footprint | 10 | 20 |
| Combination | 11 | 22 |
| Nil | 14 | 28 |
| Total | 50 | 100 |

Gross evidence: In the present study, it was seen that weapon was found as gross evidence in 20 (40%) cases only clothes were found in 8(16%) cases and combination involving clothes and weapons were found in 16 (32%) cases.

Table 4 Gross evidences found at crime scene

| | No of cases | Percentage |
|-----------------|-------------|------------|
| Clothes | 8 | 16 |
| Weapon | 20 | 40 |
| Any combination | 16 | 32 |
| Nil | 6 | 12 |
| Total | 50 | 100 |

Manner of death: It was seen that suicide was probable manner of death in 21 (42%) cases while homicide & accident were probable manner of death in 19 (38%) & 10 (20%) cases respectively.



Figure 1 Deceased body found in a pool of blood in toilet



Figure 2 Dried blood stains on ground floor

DISCUSSION

For any crime scene investigation, the most important thing for investigator is keen and fine observation apart from the assistance required at many places for different purpose. A team of the trained and qualified personnel including forensic expert, trained assistants and police officials is required for collection and correlation of evidence. This study was conducted with a purpose to look into the procedure of crime scene investigations related to various unnatural deaths. As already stated various evidences were collected in the unnatural deaths included in this study. There is paucity of identical study data in the literature for comparison of our study.

In the present study male predominance was seen in suicidal (61.9%) homicidal (73.68%) and accidental deaths (80%) probably due to the fact that males are concerned with violent activities, greater exposure to surroundings and responsibility to solve the family problems, disputes. Females were seen in 38.1% and 28% of suicidal and homicidal cases respectively. In accidental death females were involved very less at 20% as compared to males. A Retrospective study on suicidal cases was conducted by Behera A et al³ found that male's sex is very prone to take extreme decision 2.7 times more than female sex and commits suicide. Similarly Rastogi A et al⁴ and Basappa S et al⁵ respectively reported in his study that males were constituted more than 2/3rd (71.75%) of the victims which can be attributed to the aggressive nature of males than females in homicidal deaths.

In the present study, the age group of 19-40 years were mostly involved in suicide (71.42%) and homicidal (42.1%) deaths because of the young adult group is most active group of population and more exposed to external environment, strain and stress of life, outdoor activities, increased aggression and early losing of temper which leads to increase in crime rate by this age group. Singh H et al⁶ found that the age group of 21-40 yrs was most prone to suicidal deaths in 62.9%. Behera A et al³ also reported in his study that suicide is more prevalent during 20 to 40 years of age. Rastogi A et al⁴ and Basappa S et al⁵ found that age group of 18-40 were most predominant victims of homicide accounting for 64.63% & 61.50% respectively.

According to the data obtained clothes were obtained as a piece of evidence in 28.6% cases of suicide, 5.3% cases of homicide and 10% cases of accidental deaths. Weapons served as

evidence in 19% suicide, 84.2% homicide. Clothes and weapons were taken as gross evidence in the study. Whereas dry blood stains, skin scrapings, prints (fingerprints, footprints) and any combination of these were noted under trace evidences. Dry blood stains were collected in 28.5% cases of suicidal deaths, 10.5% cases of homicidal deaths and 30% cases of accidental deaths. Skin scrapings were collected as trace evidence in burn cases in 14.2% of suicidal deaths, 5.2% of homicidal deaths and 10% of accidental for detection of combustible material. Fingerprint and footprint were lifted in only 4.7% of suicidal deaths whereas in homicidal deaths, in 47.3% cases it was collected and nil in accidental deaths. Mukherjee J⁷ states that blood stains are very important clue in establishment of identity. In cases of murder and assault, blood stains may establish link between the offence, offended and the offender. It is also useful in establishing the link between an offense and offensive agent.

Blood stains also plays an important role in investigation of death from poisoning, when poison is chemically detected from blood. Mukherjee J⁷ states that fingerprints provide the proof that the suspect was present at the scene of crime and raises a presumption of his guilt but it may not be the conclusive proof of his having committed the crime unless confirmed.

The most common predisposing factor leading to death according to this study is mental illness attributing (66.7%), however disputes, love affairs, failure in education, financial problems contributed as predisposing factors (14.3%), (9.5%), (4.8%) and (4.8%) respectively for suicides, whereas dispute (73.7%) is a most common predisposing factor for homicidal deaths. Amongst the predisposing factor leading to accidental death is fear of punishment (40%) followed by loss of consciousness (30%). Chavan K et al⁸ in his study noted chronic illness and mental illness were the most common cause of suicide. Hettiarachchi J⁹ reported depression as the commonest cause for committing suicides. Lester D¹⁰ noted his study report's psychiatric problems as the predominant antecedent events for suicide followed by alcoholic, love and health problem whereas quarrel as most precipitating factor for homicide followed by robbery & love problem. Sinha U et al¹¹ noted property disputes and quarrel as the common motive for homicide

In this study hanging (47.6%) is the most common method used other than gunshot (14.3%), cut throat (9.5%), fall from height (14.3%) and burns (14.3%) for suicidal deaths. In cases of homicidal deaths strangulation (47.4%) is most common method used by the assailant to serve his purpose. Ambade V et al¹² reported that poisoning was the commonest method of suicide followed by burning, hanging, drowning whereas blunt trauma was commonest method of homicide followed by sharp trauma, burning and strangulation. Sane M et al¹³ states that hanging was the most common cause of death followed by poisoning and burns. In terms of homicide, Rastogi A et al⁴ states that in homicide, blunt injuries were commonest pattern followed by sharp object injuries, ligature application in throttling and firearm. In suicide cases the most commonly used ligature material was soft material which accounted for (42.9%) according to this study,

whereas it served as tool in (21.8%) homicidal cases by means of strangulation.

In homicidal deaths weapons except firearms (47.4%) such as knife, dagger, gupti, etc., were mostly used by the assailant to commit homicide. Patel A et al¹⁴ states in his study, 'dupatta' was most commonly used ligature material (67.5 %) which is a soft material and easily available in almost every house. In homicidal cases, Shiv kumar B et al¹⁵ study reflects that the commonest weapon of choice used for homicide purposes is sharp cutting weapons followed by hard and blunt weapons. Usually it is seen that the victim of suicide choose for private places for the commission of the act. This is related in the study where (61.9%) of suicide occurred indoor. Assailant of homicide preyed their victim mostly outdoor (73.7%) according to this study also majority of accidental deaths (70%) occurred outdoor. Ambade V et al¹² in his study states that 77.7% of the victims committed suicide inside their home compared to 12% victims which committed it outside. In homicidal cases 49.4% of victims were killed outdoor whereas 31.5% were killed in their own house.

Though a single comprehensive study including observations of major parameters is not available and attempt has been done in this study to highlight precautions and standard operating procedures in crime scene visit aimed at finding out cause and manner of death. Serious attempt was done in this study to observe evidentiary things like circumstances at the scene, findings of body, post-mortem changes, clothing, blood stains, weapon which are very important as per as connecting a criminal with the victim and the crime scene reasonably helps in determining cause and manner of death.

CONCLUSION

The general awareness regarding contribution of a scene of crime needs to be augmented amongst police investigators, judiciary and Forensic experts. Induction & on the job training programs of these functionaries needs to incorporate medico-legal aspects involved indifferent crimes. A separate cadre for medico-legal services is needed at state or central level to meet the requirements of criminal investigation or law enforcement system in the country. More frequent interaction is needed between law enforcement agencies & medical professionals. It is also necessary that there should be quick and better coordination between investigating police officer and doctor for arranging crime scene visit without delay.

Conflicts of interest: None

Contribution of Authors: "I (We) declare that this work was done by the author(s) named in this article and all liabilities pertaining

to claims relating to the content of this article will be borne by the authors".

Ethical clearance: Institutional Ethics Committee.

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