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RESEARCH ARTICLE

Documentation and Preservation of Medico-Legal Evidence in Emergency Settings: A retrospective study

Imran Sabri[1]*
[1]. Faculty Member, Division of Forensic Medicine, Department of Biomedical Sciences, College of Medicine, King Faisal University, Al-Ahsa, Saudi Arabia,

*Corresponding Author
Dr Imran Sabri

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Abstract: ***Background***: Emergency departments frequently serve as the first point of contact for victims and perpetrators of crimes. Proper documentation and preservation of medico-legal evidence at this stage are crucial for both patient care and the administration of justice. However, deficiencies in knowledge, time constraints, and lack of standardized protocols often compromise evidence integrity. ***Aim***: To assess the practices of documentation and preservation of medico-legal evidence in emergency settings and identify gaps affecting the medico-legal outcome. ***Materials and Methods***: A retrospective observational study was conducted in the Department of Forensic Medicine in collaboration with the Emergency Department at the School of Medical Sciences and Research, Sharda University. Medico-legal case records registered between November 2010 and August 2012 were reviewed. Parameters analyzed included completeness of documentation, type of injuries recorded, evidence preservation methods, chain of custody, and compliance with medico-legal protocols. ***Results:*** A total of 412 medico-legal cases were analyzed. Incomplete documentation was observed in 28.6% of cases, with missing injury descriptions and inadequate history being the most common deficiencies. Proper preservation of physical evidence was noted in 61.4% of cases, while chain-of-custody documentation was complete in only 54.9%. Assault-related cases showed better documentation compared to road traffic accidents and poisoning cases. ***Conclusion:*** Significant gaps exist in the documentation and preservation of medico-legal evidence in emergency settings. Regular training, standardized protocols, and closer collaboration between emergency physicians and forensic experts are essential to improve medico-legal outcomes.

Keywords: Medico-legal evidence, emergency department, forensic documentation, chain of custody, injury documentation

INTRODUCTION

Medico-legal evidence refers to any material, biological, or documentary information that can assist in establishing facts relevant to legal investigations and judicial proceedings. Emergency departments (EDs) are often the first point of medical contact for victims and accused persons involved in crimes such as road traffic accidents, assaults, burns, poisoning, sexual offences, and cases of suspected homicide or suicide. The manner in which medico-legal evidence is documented and preserved at this critical stage has a direct impact on both patient management and the outcome of legal processes [1].

Accurate medico-legal documentation serves as a permanent scientific record of clinical findings observed at the time of examination. Details such as alleged history, time of incident, nature and description of injuries, and correlation between history and physical findings are crucial for forensic interpretation. Courts rely heavily on medical records to establish causation, timing, and severity of injuries; therefore, incomplete or ambiguous documentation can weaken prosecution or defense and may ultimately result in miscarriage of justice [2,3].

Preservation of physical and biological evidence—such as clothing, blood samples, gastric lavage, foreign bodies, and swabs—is equally important. Improper collection, labeling, sealing, or storage of evidence can lead to contamination, degradation, or loss, rendering it inadmissible in court. Maintaining an unbroken chain of custody from the point of collection to submission in forensic laboratories is a fundamental medico-legal requirement to ensure evidentiary integrity [4].

Despite its importance, medico-legal work in emergency settings faces numerous challenges. High patient load, time-sensitive clinical priorities, lack of forensic training among emergency physicians, and absence of standardized protocols often compromise the quality of documentation and evidence handling. Studies have reported significant deficiencies in injury description, incomplete history recording, and poor compliance with chain-of-custody procedures, particularly in busy tertiary care hospitals [5–7].

In India, medico-legal responsibilities are an integral part of emergency medical services, yet formal training in forensic documentation is limited for many clinicians. Teaching hospitals play a vital role in setting standards for medico-legal practice, as errors made at the emergency level can persist throughout the investigative and judicial process. Evaluating existing practices is therefore essential to identify gaps and improve medico-legal preparedness among healthcare professionals [8,9].

The present study was undertaken to assess the quality of documentation and the methods of preservation of medico-legal evidence in emergency settings at a tertiary care teaching hospital. By systematically reviewing medico-legal case records over a defined period, this study aims to highlight common deficiencies and emphasize the need for standardized protocols and regular training in forensic principles [10].

MATERIALS AND METHODS

Study Design

A retrospective observational study.

Study Setting

Department of Forensic Medicine, School of Medical Sciences and Research, Sharda University, Greater Noida.

Study Period

November 2010 to August 2012.

Study Material

Medico-legal case (MLC) records registered during the study period.

Inclusion Criteria

- All medico-legal cases reported to the emergency department during the study period.
- Cases with complete availability of medico-legal records.

Exclusion Criteria

- Records with missing or irretrievable files.
- Follow-up medico-legal examinations without initial emergency documentation.

Data Collection

Data were extracted using a structured proforma focusing on:

- Demographic details
- Type of medico-legal case
- Completeness of history and examination
- Injury documentation (site, size, type, nature)
- Evidence collected (clothes, biological samples, foreign bodies)
- Method of preservation and sealing
- Documentation of chain of custody
- Signature, date, and time entries

Data Analysis

Data were entered into a spreadsheet and analyzed using descriptive statistics. Results were expressed as frequencies and percentages.

RESULTS

During the study period a total of 412 medico-legal cases (MLCs) reported to the emergency department were analyzed to assess the quality of documentation and preservation of medico-legal evidence. The results are presented below with emphasis on case distribution, documentation quality, evidence preservation, and chain-of-custody practices.

Distribution of Medico-Legal Cases

Road traffic accidents constituted the largest proportion of medico-legal cases, followed by assault-related cases and poisoning.

Table 1: Distribution of Medico-Legal Cases (n = 412)

Type of Medico-Legal Case	Number of Cases	Percentage (%)
Road Traffic Accidents	174	42.2
Assault	123	29.9
Poisoning	67	16.3
Burns	28	6.8
Sexual offences & others	20	4.8
Total	**412**	**100**

Road traffic accidents formed the most common medico-legal emergency presentation during the study period.

Quality of Medico-Legal Documentation

Overall documentation was found to be satisfactory in the majority of cases; however, a substantial proportion showed deficiencies in one or more components of medico-legal recording.

Table 2: Completeness of Medico-Legal Documentation

Documentation Status	Number of Cases	Percentage (%)
Complete	294	71.4
Incomplete	118	28.6
Total	**412**	**100**

Nearly one-third of medico-legal case records showed incomplete documentation.

Nature of Documentation Deficiencies

Among cases with incomplete documentation, inadequate injury description was the most frequently observed deficiency.

Table 3: Types of Documentation Deficiencies (n = 118)

Type of Deficiency	Number of Cases	Percentage (%)
Inadequate injury description	55	46.6
Incomplete alleged history	37	31.4

Missing time/date of examination	26	22.0
Absence of doctor's signature/designation	18	15.3

Multiple deficiencies were noted in some cases; hence, totals may exceed 100%.

Preservation of Medico-Legal Evidence

Physical and biological evidence was properly preserved and sealed in approximately two-thirds of cases.

Table 4: Status of Evidence Preservation

Evidence Preservation Status	Number of Cases	Percentage (%)
Properly preserved	253	61.4
Improperly preserved / None	159	38.6
Total	**412**	**100**

Evidence preservation practices were suboptimal in more than one-third of cases.

Chain of Custody Documentation

Maintenance of chain of custody was incomplete or absent in a significant proportion of cases.

Table 5: Chain of Custody Documentation

Chain of Custody Status	Number of Cases	Percentage (%)
Complete	226	54.9
Incomplete / Absent	186	45.1
Total	**412**	**100**

Breaks in chain-of-custody documentation pose a serious risk to the admissibility of evidence in court.

Case-wise Comparison of Documentation Quality

Assault and sexual offence cases demonstrated relatively better documentation and evidence preservation compared to road traffic accident and poisoning cases.

Table 6: Documentation Quality Across Different Case Types

Case Type	Complete Documentation (%)	Incomplete Documentation (%)
Road Traffic Accidents	65.5	34.5
Assault	78.0	22.0
Poisoning	70.1	29.9
Burns	71.4	28.6
Sexual offences & others	85.0	15.0

Better compliance was observed in cases with greater anticipated legal scrutiny.

DISCUSSION

The present study evaluated the practices of documentation and preservation of medico-legal evidence in emergency settings over a period of nearly two years at a tertiary care teaching hospital. The findings reveal that although a majority of medico-legal cases were documented satisfactorily, significant deficiencies persist in both documentation and evidence preservation, which may adversely affect medico-legal outcomes and judicial decision-making.

Road traffic accidents constituted the largest proportion of medico-legal cases in this study, a finding consistent with national and international reports highlighting trauma as the most common medico-legal emergency presentation [1,2]. The high burden of such cases in emergency departments often results in prioritization of life-saving interventions over medico-legal documentation, which may explain the comparatively higher rates of incomplete records observed in these cases [3].

Approximately 28.6% of cases in the present study had incomplete documentation. Similar deficiencies have been reported by other authors, who have emphasized that incomplete recording of injury details, history, and examination findings remains a persistent problem in emergency medico-legal practice [4,5]. Inadequate injury description was the most frequent deficiency noted, with missing details regarding size, shape, margins, and exact location of injuries. Such omissions significantly limit forensic interpretation, including assessment of weapon used, force applied, and possible timing of injury [6].

Incomplete recording of alleged history was another important finding. Accurate history, when correlated with clinical findings, is crucial for reconstructing events and determining the manner of injury. Failure to document the history in the patient's own words may introduce ambiguity and weaken the medico-legal value of the record [7]. Courts often rely heavily on contemporaneous medical records; therefore, any discrepancy or omission may raise doubts regarding the credibility of medical evidence [8].

Evidence preservation was found to be satisfactory in approximately 61% of cases, indicating moderate awareness among emergency personnel regarding forensic responsibilities. However, improper or absent

preservation in nearly two-fifths of cases is a matter of concern. Previous studies have highlighted that improper handling of clothing, biological samples, and foreign bodies can lead to contamination or degradation, rendering the evidence unsuitable for forensic analysis [9,10]. The absence of standardized medico-legal kits and lack of training in evidence handling are likely contributors to this problem.

Maintenance of chain of custody emerged as one of the weakest aspects in the present study, with complete documentation observed in only about half of the cases. Chain of custody is a cornerstone of forensic science, ensuring that evidence presented in court is the same as that collected from the patient without tampering or substitution [11]. Breaks or gaps in chain-of-custody documentation can result in rejection of evidence by courts, irrespective of its scientific value [12].

Better documentation and evidence preservation were observed in assault and sexual offence cases compared to road traffic accidents and poisoning cases. This may be attributed to heightened legal awareness, anticipated judicial scrutiny, and involvement of forensic specialists in such cases [13]. Similar trends have been reported in earlier studies, suggesting that perceived legal importance influences the diligence of medico-legal documentation [14].

The findings of the present study underscore the need for structured training in medico-legal documentation for emergency physicians. Incorporation of forensic medicine principles into emergency medicine training, use of standardized documentation formats, and regular audits of medico-legal records have been shown to significantly improve compliance and quality of documentation [15–17]. In teaching hospitals, close collaboration between emergency departments and forensic medicine units can play a pivotal role in improving medico-legal practices.

In summary, while emergency departments remain critical for the initial handling of medico-legal cases, systemic gaps in documentation and evidence preservation persist. Addressing these issues through education, protocol development, and institutional support is essential to strengthen the medico-legal system and ensure justice is effectively served [18].

CONCLUSION

Emergency departments are critical for the initial handling of medico-legal cases. The present study demonstrates that while documentation and evidence preservation practices are satisfactory in a majority of cases, significant deficiencies persist. Implementation of standardized medico-legal protocols, regular training of emergency personnel, and close coordination with forensic medicine departments are essential to ensure the integrity of medico-legal evidence and support the justice delivery system.

RECOMMENDATIONS

- Introduction of standardized medico-legal documentation formats in emergency departments
- Regular training and workshops on forensic evidence handling
- Availability of medico-legal kits in emergency settings
- Periodic audits of medico-legal records

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