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A Study on Burn Injuries: Clinical, Pathological and Medico-Legal Evaluation at Patna Medical College and Hospital, Department of Forensic Medicine and Toxicology, Patna, Bihar, India

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Abstract

Background: Burn injuries continue to be a significant cause of morbidity and mortality worldwide and are frequently encountered in medico-legal practice. Objectives: To assess the clinical profile, pathological characteristics, and medico-legal aspects of burn cases presenting at Patna Medical College and Hospital. **Methods**: A hospital-based descriptive observational study was carried out on 110 burn cases. A total of 110 burn cases were studied over a period of one year from 1 May 2025 to 1 May 2026 at Patna Medical College and Hospital.

Results: Thermal burns constituted the majority of cases. Individuals in the 20–40 year age group were most commonly affected. Increased total body surface area (TBSA) involvement was strongly associated with complications such as shock and sepsis.

Conclusion: Burn injuries follow predictable clinical and medico-legal patterns. Early recognition, prompt management, and accurate documentation are essential for improving patient outcomes and ensuring proper legal evaluation.

Keywords: Burn Injury, Forensic Medicine, TBSA, Medico-Legal, Thermal Burns, India

Introduction

Burn injuries are a major public health issue across the globe, particularly in low- and middle-income countries. They result in significant mortality, prolonged hospitalization, and long-term disability.

According to the World Health Organization, nearly 180,000 deaths occur annually due to burns, with the highest burden seen in developing regions. Globally, approximately 11 million people sustain burn injuries each year, and nearly 70–90% of these occur in resource-limited settings.

In terms of etiology, flame burns account for approximately 40–50% of cases, followed by scald burns (30–35%), while electrical (3–5%) and chemical burns (2–3%) are less common. Fire, heat, and hot substances together contribute to nearly 70–80% of burn injuries worldwide.

In India, burn injuries are frequently associated with domestic accidents, occupational exposure, suicidal attempts, and homicidal incidents such as dowry-related deaths, thereby increasing their medico-legal importance.

Materials and Methods

This descriptive observational study was conducted in the Department of Forensic Medicine C Toxicology, Patna Medical College and Hospital.

Sample Size: 110 cases

Study Duration: 1 year (1 May 2025 to 1 May 2026)

Inclusion Criteria: All types of burn cases (thermal, chemical, electrical) Patients of all age groups and both sexes Medico-legal cases examined at the institution

Exclusion Criteria

- Superficial non-burn injuries
- Healed burn scars without active findings
- Incomplete or insufficient records

- Parameters Studied
- Cause and type of burn
- Depth and TBSA involvement
- Clinical presentation and complications
- Outcome and medico-legal findings

Results

Among the 110 cases studied:

Thermal burns were the predominant type

Majority of patients belonged to the 20–40 years age group

Flame burns were the most frequent cause

Increased TBSA involvement was associated with higher rates of shock, sepsis, and mortality.

Discussion

The findings of the present study are in agreement with global epidemiological trends, where thermal burns represent the most common type of injury. The higher incidence among young adults may be attributed to occupational exposure and domestic hazards.

In developing countries, factors such as overcrowding, use of open flames, and lack of safety awareness contribute significantly to burn incidence. The strong association between increased TBSA and poor clinical outcome observed in this study is well supported by existing literature.

Burn injuries not only lead to physical morbidity but also have psychological and socio-economic consequences, emphasizing the need for preventive strategies and improved burn care facilities.

Medico-Legal Importance

Determination of manner of injury (accidental, suicidal, homicidal)

Differentiation between antemortem and postmortem burns

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Detection of soot particles indicating inhalation during life

Significant role in dowry death investigations

Conclusion

Burn injuries continue to pose a major clinical and medico-legal challenge. The observations from Patna Medical College and Hospital are consistent with global data. Emphasis on prevention, early treatment, and accurate medico-legal documentation is essential to reduce morbidity and mortality.

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