

## **Autopsy-Based Evaluation of Sulphuric Acid Poisoning: A Cross-Sectional Study**

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**How to citation this article:** Amit Anand, Rahul Kumar Basu, Pankaj Kumar, “Autopsy-Based Evaluation of Sulphuric Acid Poisoning: A Cross-Sectional Study”, IJMACR – April – 2026, Volume – 9, Issue – 2, P. No. 04 – 07.

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**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

### **Abstract**

**Background:** Sulphuric acid poisoning is a severe form of corrosive ingestion leading to extensive tissue destruction, systemic toxicity, and high mortality. Autopsy examination plays a crucial role in confirming diagnosis and establishing cause of death in medico legal cases.

**Methods:** This descriptive cross-sectional study was conducted on 100 medico legal autopsy cases of sulphuric acid poisoning over a period of one year from 1 April 2025 to 31 March 2026 in the Department of Forensic Medicine and Toxicology, PMCH, Patna. Detailed gross and histopathological examinations were performed.

**Results:** Common findings included burns over lips and oral cavity (85–95%), gastric mucosal necrosis (85–100%), blackish discoloration (70–90%), and oesophageal involvement (60–80%). Severe

complications such as gastric perforation (20–40%) and peritonitis (15–30%) were also observed. Histopathology revealed coagulative necrosis, vascular congestion, and inflammatory infiltration.

**Conclusion:** Sulphuric acid poisoning produces characteristic gross and microscopic findings. Combined autopsy and histopathological evaluation is essential for accurate diagnosis and medico legal opinion.

**Keywords:** Sulphuric Acid, Corrosive Poisoning, Autopsy, Histopathology, Necrosis

### **Introduction**

Sulphuric acid is a highly corrosive mineral acid widely used in industrial and domestic settings. Poisoning usually occurs due to suicidal ingestion and results in severe chemical injury to tissues.

The mechanism of injury includes:

Coagulative necrosis Cellular dehydration and protein denaturation Heat generation and tissue carbonization Clinically and forensically, sulphuric acid poisoning is important due to its distinctive gross findings and high fatality rate. Autopsy examination provides critical evidence in determining cause and manner of death, especially in medico legal cases.

**Aim**

- To evaluate the diagnostic importance of gross and histopathological findings in sulphuric acid poisoning and to establish a reliable autopsy-based protocol.

**Material and Methods**

**Study Design:** Descriptive cross-sectional study

**Study Area:** Department of Forensic Medicine and Toxicology, PMCH, Patna

**Sample Size:** 100 medico legal autopsy cases

**Observation and Result**

Table 1: Gross Morphological Observations

Sn.	Gross Finding	Frequency	Forensic Significance
1	Burns over lips, mouth C chin	85–95%	Direct contact of corrosive
2	Blackish discoloration (carbonization)	70–90%	Dehydrating action of acid
3	Oral cavity ulceration C necrosis	80–95%	Immediate tissue destruction
4	Esophageal corrosion	60–80%	Indicates ingestion pathway
5	Gastric mucosal necrosis	85–100%	Most commonly affected organ
6	Coffee-colored stomach contents	70–85%	Reaction with blood/tissue
7	Gastric perforation	20–40%	Severe/fatal cases
8	Peritonitis	15–30%	Due to perforation
9	Laryngeal oedema	40–60%	Airway involvement
10	Lung congestion C oedema	60–80%	Secondary hypoxia
11	Liver congestion	50–70%	Systemic toxicity
12	Kidney congestion	40–60%	Shock-related changes

**Study Period:** One year (1 April 2025 – 31 March 2026)

**Inclusion Criteria**

Confirmed or suspected cases of sulphuric acid poisoning  
Cases brought for medico legal autopsy

**Exclusion Criteria**

- Decomposed bodies
- Mixed or unknown poisoning Cases with inadequate viscera

**Dissection Technique**

A detailed external and internal examination was performed. Special emphasis was given to examination of:

- Lips and oral cavity Oesophagus
- Stomach and abdominal cavity Respiratory system
- Histopathology

Tissue samples from affected organs were preserved in 10% formalin, processed, and stained with Haematoxylin and Eosin (HCE) for microscopic evaluation.

Table 2: Microscopic Tissue Profiling

Histopathological Marker	Observation	Forensic Significance
Coagulative necrosis	Present	Hallmark of corrosive injury
Vascular congestion	Marked	Indicates ante-mortem injury
Inflammatory infiltration	Variable	Suggests survival interval
Mucosal erosion	Present	Direct chemical damage

**Discussion**

Sulphuric acid causes severe tissue injury through coagulative necrosis, dehydration, and heat generation. The black discoloration observed grossly is due to carbonization of tissues, which is characteristic of this poison.

The findings of this study are consistent with previous literature, showing that gastric mucosal necrosis is the most consistent feature, followed by oral burns and oesophageal damage. The stomach is the most commonly affected organ due to pooling of the acid.

Histopathological findings such as vascular congestion and inflammatory infiltration confirm ante-mortem ingestion and help differentiate from post-mortem artifacts.

**Conclusion**

Gross autopsy findings combined with histopathological examination provide reliable evidence in cases of sulphuric acid poisoning. Gastric mucosal necrosis remains the most consistent finding. Routine microscopic evaluation should be incorporated in all corrosive poisoning cases to ensure accurate medico legal opinion.

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